A REVIEW ON FORMULATION AND EVOLUTION OF HERBAL SHAMPOO

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ABSTRACT:

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 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.

Keywords:Herbal Shampoo,cosmetics,Evaluation of hampoo,Hibiscus,Reetha, shikakai,Alovera,fenugreek ,olive oil.

Introduction

Hair is a vital structure of the human body, derived from the ectodermal layer of the skin. It serves as a protective appendage and is classified as an accessory structure of the integumentary system, along with sebaceous glands, sweat glands, and nails .

Hair is considered an essential component of human beauty. It serves multiple biological functions, including sebum secretion, apocrine sweat and pheromone production, thermoregulation, and protection against environmental aggressors. The primary purpose of hair care products is to cleanse the hair; however, they also play a significant role in altering hair texture, providing nourishment, and enhancing its overall appearance and health.

Nowadays, people have become increasingly conscious about their hair, as rising pollution levels contribute significantly to hair damage. Pollutants adversely affect hair, leading to problems such as split ends, roughness, reduced hair growth, loss of shine, and hair fall. Although these issues are often addressed using shampoos, synthetic shampoos are typically formulated with chemical constituents that may cause side effects and further damage to the hair.

In contrast, polyherbal shampoos are formulated using natural ingredients that possess inherent cleansing properties. These natural components are effective in maintaining hair health without producing harmful side effects. The use of herbal ingredients is advantageous due to their purity and biocompatibility .

Commercially available shampoos often contain artificial ingredients that may be harmful to the skin and hair. A common surfactant used in these formulations, sodium lauryl sulfate (SLS), can damage hair follicles and cause scalp irritation. Additionally, preservatives such as formaldehyde are frequently incorporated into shampoo formulations, which may increase skin sensitivity. As consumers have become more aware of the potential adverse effects of synthetic ingredients on the skin, hair, and eyes, there has been a growing preference for herbal-based products. Herbal shampoos are generally considered safer, as their side effects are minimal. Various types of shampoos are available on the market, including medicated shampoos, liquid herbal shampoos, lotions, powders, clear liquids, and solid gels .

Similar to ordinary shampoos, herbal shampoos are formulated with natural ingredients and are designed to cleanse both the hair and scalp. These shampoos exhibit good stability, cause minimal damage compared to synthetic shampoos, and have negligible adverse effects, as they are typically free from harsh synthetic surfactants. In contrast, synthetic shampoos often contain surfactants that, when used over prolonged periods, can lead to serious side effects such as split ends, eye irritation, hair loss, dryness, and premature graying of hair. Because of these concerns, consumers are increasingly turning toward herbal shampoos, which are perceived as safer and more compatible with the natural physiology of the hair and scalp. In daily life, shampoos are among the most widely used cosmetic products for cleansing the hair and scalp. Essentially, a shampoo is a detergent-based preparation containing suitable additives that provide additional benefits such as lubrication, medicinal properties, and enhanced conditioning. Various types of shampoos are available on the market today, including synthetic, herbal, medicated, and non-medicated formulations. However, consumers are increasingly inclined toward herbal shampoos, as they are perceived to be safer and free from adverse effects due to their natural origin.

Synthetic shampoos commonly contain surfactants that facilitate foaming and cleansing; however, prolonged use of these agents may lead to undesirable effects such as hair loss, scalp irritation, and eye discomfort. Herbal shampoo formulations are considered a promising alternative to synthetic variants, though developing effective products using only natural ingredients can be challenging. A wide range of medicinal plants is commonly incorporated into herbal shampoo formulations owing to their reputed therapeutic and nourishing effects on hair.

❖ Objectives of the Research Work

a)understand the significance of polyherbal shampoos.
b)Explore the concept and formulation of polyherbal shampoos.
c) Identify the ideal properties and characteristics of an effective polyherbal shampoo.
d) Study the evolution and development of polyherbal shampoos.

These plant components can be utilized in various forms, such as derivatives, refined extracts, powders, or crude materials. However, developing a herbal shampoo using only natural ingredients that is as safe, mild, and effective as a synthetic formulation—while maintaining comparable foaming, cleansing, and solid content properties—is highly challenging.

In this research, an attempt was made to formulate a purely herbal shampoo using plants that are traditionally and widely used for hair cleansing in Oman, the Gulf region, and particularly India. For centuries, the Indian traditional system of medicine has employed the pericarp of *Sapindus mukorossi* (commonly known as soapnut or reetha), the fruits of *Phyllanthus emblica* (Amla), and the dried pods of *Acacia concinna* (Shikakai) for hair washing (Kapoor, 2005). *Reetha* and *Shikakai* are rich in saponins, which produce abundant foam when mixed with water and exhibit beneficial effects on the skin and other organ systems. *Amla*, being a rich source of vitamin C, is widely used in hair treatments as a strengthening, anti-dandruff, and hair growth–promoting agent.

The *Ziziphus spina-christi* tree, locally known as *Sidr* in Arabic, is indigenous to the Middle East, including Oman. Its leaves have been traditionally used by women to wash, darken, and lengthen hair. It is reported to

contain four saponin glycosides that effectively remove excess sebum without causing irritation or adverse reactions. Moreover, saponins possess antibacterial and antifungal properties, making them valuable components in cosmetic formulation.

Ideal properties of herbal shampoo

❖ *Composition of Shampoo*

a) **Principal Surfactant:**

The main cleansing agent that removes oil, dirt, and impurities from hair and scalp.

Examples: Sodium lauryl sulfate (SLS), Sodium lauryl ether sulfate (SLES), Ammonium lauryl sulfate.

b) **Secondary Surfactant:**

Used to enhance foam quality, improve mildness, and reduce irritation caused by the principal surfactant.

Examples: Cocamidopropyl betaine, Lauramide DEA, Coco diethanolamide.

c) Antidandruff Agents:

Help control dandruff and prevent fungal or microbial growth on the scalp.

Examples: Zinc pyrithione, Ketoconazole, Selenium sulfide, Sulfur, Salicylic acid.

d) **Conditioning Agents:**

Provide smoothness, shine, and manageability to hair; prevent dryness and tangling.

Examples: Silicones (Dimethicone), Quaternary ammonium compounds, Proteins, Herbal extracts like Aloe vera or Hibiscus.

e) Pearlescent Agents:

Impart a shiny, pearly appearance to the shampoo and improve aesthetic appeal.

Examples: Glycol stearate, Ethylene glycol distearate.

f) **Sequestrants (Chelating Agents):**

Bind metal ions (like calcium and magnesium) present in water to enhance cleaning efficiency and stability.

Examples: EDTA (Ethylenediaminetetraacetic acid), Citric acid.

g) **Thickening Agents:**

Used to increase viscosity and improve texture and handling.

Examples: Sodium chloride, Xanthan gum, Hydroxyethyl cellulose.

Colours, Perfumes, and Preservatives:

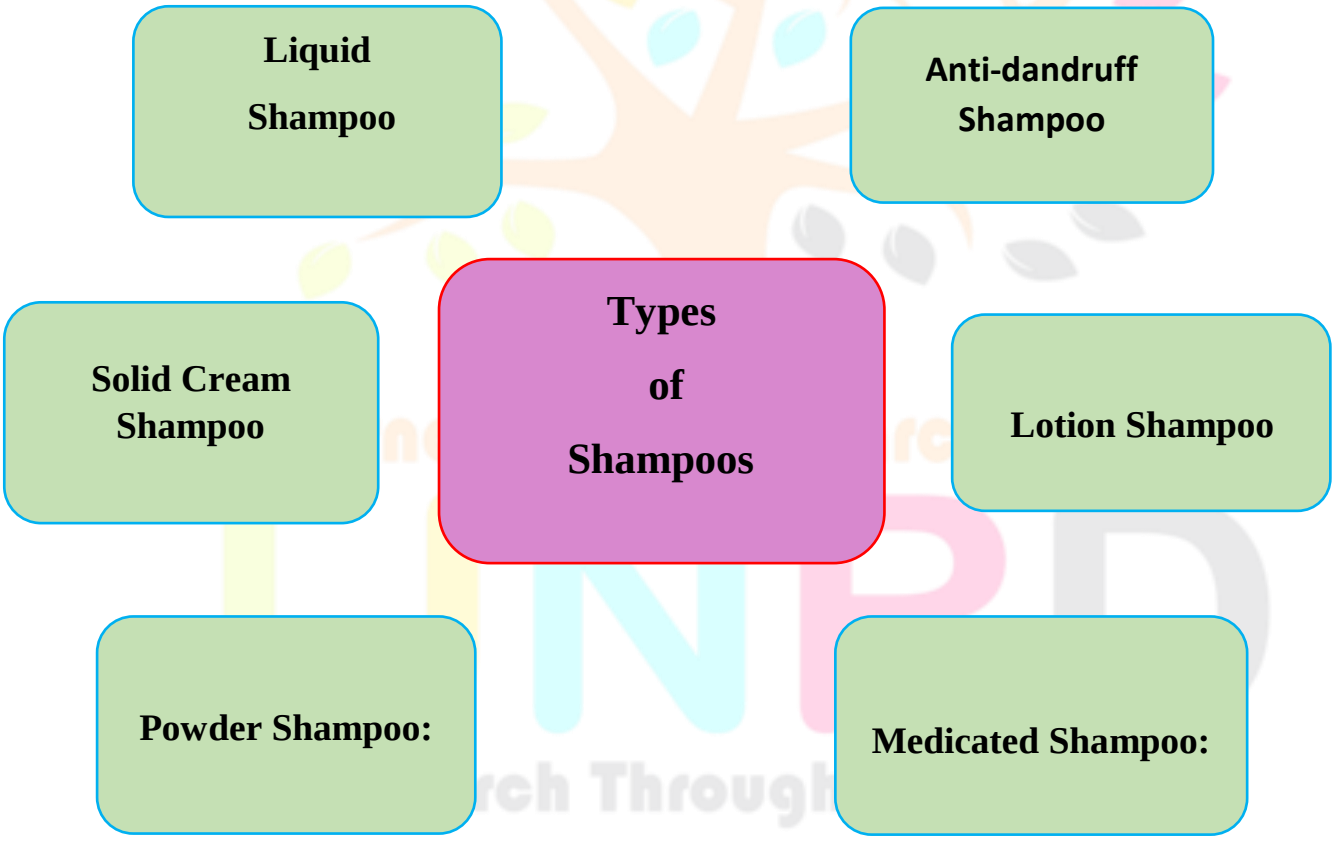
Colours: Improve visual appeal.

Perfumes: Provide a pleasant fragrance.

Preservatives: Prevent microbial growth and extend shelf life.

Examples: Methylparaben

❖ **Types of Shampoos**



1. **Liquid Shampoo:**

Most common type of shampoo.

Contains surfactants, conditioners, and additives in an aqueous base.

Easy to apply and rinse.

Examples:

Herbal shampoos, medicated shampoos.

2. **Solid Cream Shampoo:**

Semi-solid form containing higher fatty alcohols and detergents.

Creamy consistency that can be rubbed directly onto wet hair.

Provides good cleansing and conditioning effects.

3. **Jelly Shampoo:**

Thick, gel-like consistency.

Usually contains natural gums or synthetic polymers as thickening agents.

Offers luxurious texture and easy spreadability.

4. **Powder Shampoo:**

Dry, free-flowing powder form.

Suitable for travel and for oily hair types.

Contains powdered surfactants and absorbents like starch or clay.

Example:

Dry shampoos used without water.

5. **Lotion Shampoo:**

Emulsion-based formulation with both oil and water phases.

Provides mild cleansing and good conditioning properties.

Suitable for dry or damaged hair.

6. **Aerosol Foam Shampoo:**

Packaged under pressure in aerosol containers.

Dispenses as foam, easy to apply directly to hair.

Convenient for quick or waterless hair cleaning (e.g., dry foam shampoos).

7. **Baby Shampoo:**

Mild formulation designed for infants and children.

Free from harsh surfactants and irritants.

Has a neutral pH and uses mild cleansing agents like amphoteric surfactants (e.g., coco betaine).

8. **Medicated Shampoo:**

Contains therapeutic agents for treating scalp and hair disorders.

Examples:

Antifungal: Ketoconazole, Selenium sulfide.

Antidandruff: Zinc pyrithione.

Antiseborrheic: Salicylic acid, Sulfur.

9. **Clear Liquid Shampoo:**

Transparent liquid formulation with minimal or no pearlescent agents.

Aesthetically appealing and often marketed as “pure” or “mild.”

Commonly used as herbal or baby shampoos.

10. **Conditioning Shampoo (2-in-1 Shampoo):**

Contains both cleansing and conditioning agents.

Leaves hair soft, smooth, and manageable without the need for a separate conditioner.

Contains silicones, proteins, or quaternary ammonium compounds.

11. **Liquid Herbal Shampoo:**

Formulated using herbal extracts (e.g., Amla, Shikakai, Reetha, Aloe vera, Hibiscus).

Natural alternative with cleansing, conditioning, and therapeutic properties.

Mild and environmentally friendly.

12. **Anti-dandruff Shampoo:**

Specifically formulated to control dandruff and scalp irritation.

Contains antifungal and keratolytic agents.

Common ingredients: Zinc pyrithione, Ketoconazole, Selenium sulfide, Sulfur, or Salicylic acid.

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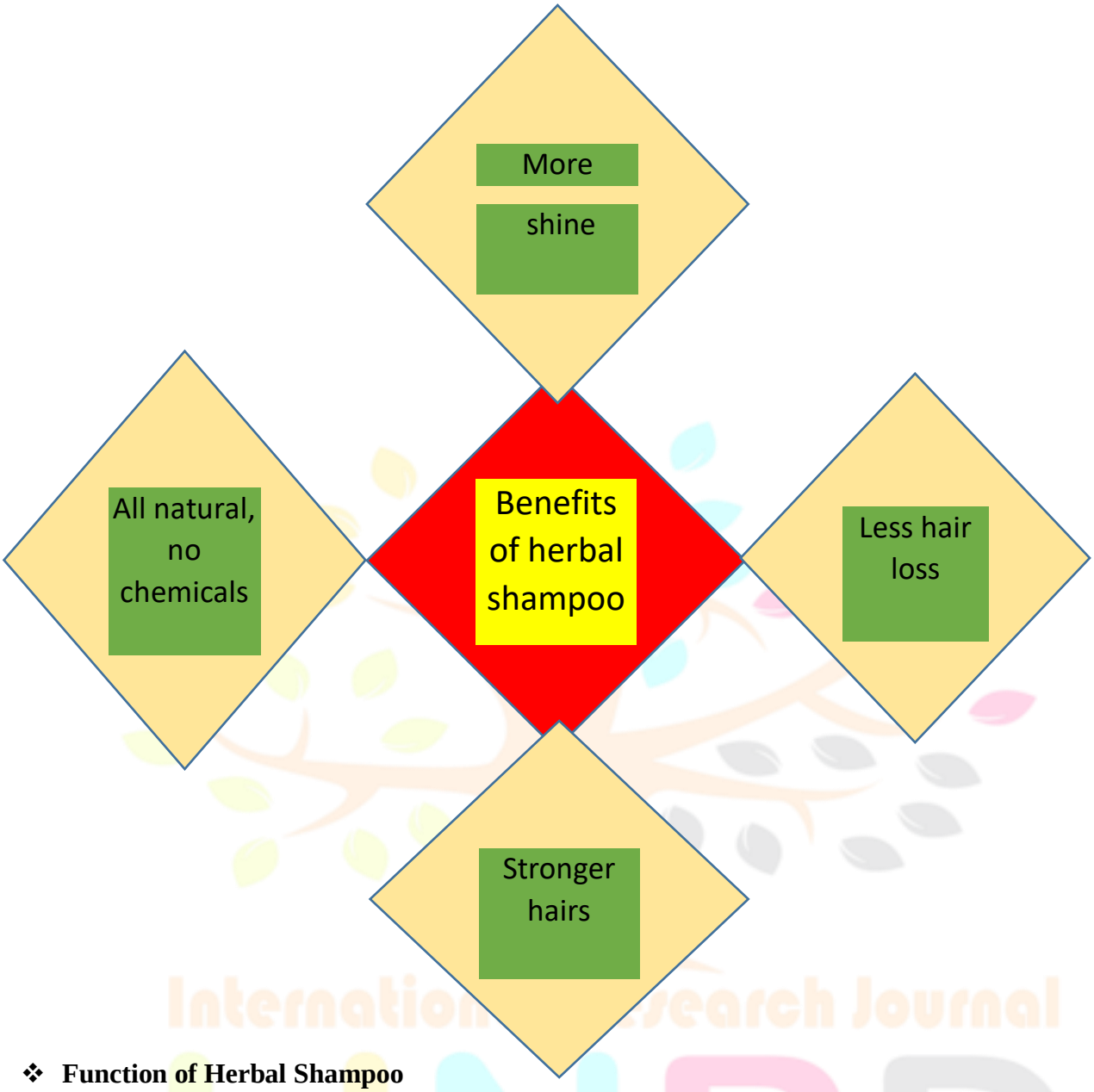
❖ Benefits of Herbal Shampoo



❖ Function of Herbal Shampoo

- **Lubrication:** Helps to smooth and soften the hair strands, reducing friction and tangling.
- **Conditioning:** Nourishes and moisturizes the hair, improving texture and manageability.
- **Hair Growth:** Stimulates hair follicles and promotes the growth of strong, healthy hair.
- **Maintenance of Hair Colour:** Helps preserve the natural or dyed colour of hair, preventing fading.
- **Medication:** Provides therapeutic benefits through herbal ingredients that can help treat scalp conditions such as dandruff, itching, or infections.

❖ History

The origins of herbal shampoo can be traced back to ancient India, where people used natural ingredients to cleanse and nourish their hair. Early concoctions were made by **boiling soapberries (reetha or Sapindus)** with other herbs such as **dried Indian gooseberry (amla)**. These mixtures produced a gentle, cleansing lather.

Soapberries contain **saponins**, natural surfactants known in ancient Indian texts as *phenaka*, which effectively removed oil and dirt from the hair. Other traditional ingredients, including **shikakai (Acacia concinna)** and **hibiscus flowers**, were also widely used for their cleansing and conditioning properties.

The practice of hair cleansing and **"champu"** (meaning head massage) was integral to Indian self-care rituals. During the colonial period, early British traders in India adopted this practice. The concept—and the word

itself—traveled back to Europe, where "shampoo" evolved from the Hindi word *chāmpo*, meaning to massage or knead.

Evolution into Modern Shampoo

By the **18th century**, the concept of "shampooing" was introduced to Britain by **Sake Dean Mohammed**, an Indian entrepreneur who opened a bathhouse in Brighton offering therapeutic head massages and herbal treatments.

In the **19th century**, "shampooing" referred mainly to a head massage rather than the washing product itself. However, by the **early 20th century**, the meaning shifted toward the **hair-cleansing liquid** we recognize today, with the first **commercial shampoos** appearing on the market.

From the **mid-20th century onward**, shampoo formulations became increasingly industrialized, often relying on synthetic detergents. In recent decades, however, there has been a strong **resurgence of interest in traditional herbal ingredients**. Modern brands—especially in India—have reintroduced elements like **reetha, shikakai, and amla** into **sulfate-free or natural formulations**, aligning ancient wisdom with contemporary cosmetic science.Top of Form

- **MATERIAL USED:**

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

- **Ingredients and its Role:**

No.	Ingredients	Role of Ingredients
1.	Ritha Extracts	Foaming agents
2	Amla Extract	To provide nourishment to hair
3.	Shikakai Extract	Anti –Dandruff
4.	Methyle Paraben	Preservative
5.	Gelatine Solution	Base
6.	Citric Acid	To adjust PH
7.	Rose oil	Perfume
8	Fenugreek Extract	Flavouring agents
9	Olive oil	Anti-inflammatory

❖ CONTENT AND ITS QUANTITY REQUIREMENT

Sr.No	Ingredients	Ouantity Given (for 100gm).	Quantity Taken for (10gm)
1.	Ritha Extract	1%	10gm
2.	Amla Extract	1%	10gm
3.	Shikakai Extract	1%	10gm
4.	Methyl Paraben	1mL	0.5%
5.	Gelatine Solution	5%(qs)	Qs
6.	Citric acid	1%	Qs
7.	Rose oil	0.1mL	0.01mL
8.	Fenugreek Extract	1%	10gm
9.	Olive oil	0.1mL	o.o1mL

❖ Procedure

1. Preparation of Extracts

(a) Ritha Extract (Cold Maceration Method):

Take **10 g of Ritha powder** and add it to **30 mL of 70% ethyl alcohol**.

Keep the mixture aside for **24 hours** at room temperature with occasional stirring.

Filter the extract and collect the filtrate.

(b) Amla Extract:

Take **10 g of Amla powder** and **boil it in 50 mL of water** for about **15–20 minutes**.

Cool the mixture and filter to obtain the extract.

(c) Shikakai Extract:

Take **10 g of Shikakai powder** and **boil it in 50 mL of water** for about **15–20 minutes**.

Cool and filter the extract.

2. Preparation of Gelatin Solution

Boil **50 mL of water** and add **1 g of gelatin powder** slowly with continuous stirring.

Boil again for **5 minutes** until completely dissolved.

Allow to cool slightly.

3. Mixing of Extracts

Mix the **Ritha, Amla, and Shikakai extracts** thoroughly.

Add the **gelatin solution** slowly while stirring continuously.

Triturate (blend) the mixture well until a uniform gel-like consistency is achieved.

Requirements / Ideal Properties of a Shampoo

Should effectively **remove sebum, dirt, and pollutants** from scalp and hair.

Should **remove residues** of previously used styling products (e.g., gels, sprays).

Should produce an **optimal amount of foam** for user satisfaction.

Should be **non-toxic, non-irritating**, and **safe for regular use**.

Should leave hair **soft, manageable, and lustrous**.

- **HERBS COMMONLY USED IN HERBAL SHAMPOO**

Botanical name	Common name	Family	Function /Uses	Figure
Lawsonia Inermis	Henna	Lythraceae	Promotes growth of hair,conditioner	

Azadirachta indica	Neem	Meliaceae	Antimicrobial agents,Prevents thedryness of hairsand flaking property	
Ocimum sanctum	Tulsi	Lamiaceae	Anti microbial andanti-lice property	
Acacia concinna	Shikakai	Mimosaceae or Fabaceae	Retains natural oilof hair,Keeps hair lustrous and healthy	
Aloe barbadensis	Aloe vera	Asphodelaceae	Containing and moisturizing effect	
Citrus lemon	Lemon	Rutaceae	Maintain the PH and imparts fragrance to preparation	

Hibiscus rosa sinensissr	China rose	Malvaceae	Prevents hair loss and hair growth promoter	
Sapindus mukorossi	Soap nut/ Reetha	**Sapindaceae**.	Detergent and antidandruff	
Trigonella foenum graceum	fenugreek	Fabaceae	Cleansing and softening	
Zingiber officinalis	Ginger	Zingiberaceae	Promotes hair growth.	
Withania somnifera	Ahwagandha	Solanaceae	Controls hair fall,promotes hair growth,improves circulation of thescalp.	

Olea europaea	Olive oil	Oleaceae	Provides healthy fats, contain antioxidants.	

❖ Content and process of fenugreek and olive oil

- **Fenugreek**

Fenugreek (methi) is widely used in herbal shampoos for its benefits in strengthening hair, controlling dandruff, and promoting hair growth. Shampoos containing fenugreek are generally reviewed favorably for their natural, cost-effective, and safe alternative to synthetic products, with few side effects.

Fenugreek content and benefits

Fenugreek seeds and leaves are rich in essential nutrients and plant compounds that contribute to hair health.

Proteins and Iron: These are essential building blocks for hair structure and help reduce hair fall.

Nicotinic Acid and Lecithin: These compounds nourish the scalp and hair roots, enhancing blood supply to the scalp and stimulating hair follicles.

Saponins and Flavonoids: These provide anti-inflammatory and antifungal properties, which help combat dandruff and other scalp irritations.

Moisture Retention: The mucilaginous fiber in fenugreek helps condition and moisturize hair, adding shine and softness.

Review suggest that fenugreek-base shampoos are effective for various hair concerns, including dryness dullness. hair loss, and flakiness.

Process

Fenugreek is typically incorporated into shampoos in the form of an extract, which is prepared using standard cosmetic formulation techniques.

1. **Extraction:** Fenugreek seeds or leaves are cleaned and processed to obtain the extract. This commonly involves soaking the plant material overnight in water or 50% ethanol, followed by boiling (decoction) or maceration to release the active compounds. The liquid extract is then filtered.
2. **Formulation**: The fenugreek extract is combined with their ingredients, which often include other herbal extracts like reetha (natural cleanser), hibiscus , neem, and aloe vera, along with surfactants (natural or synthetic), preservatives (if not self-preserving), and conditioning agents.
3. **Evaluation**: The final shampoo undergoes various tests to ensure quality, including assessment of:
    1. Ph balance: Typically maintained between 6.0 and 6.5 to be gentle on the scalp.
    2. Foaming ability and stability: The presence of natural saponins from fenugreek or reetha provides good lather.
    3. Cleansing and conditioning properties: The shampoo is evaluated for its ability to clean effectively while leaving the hair soft and manageable.
    4. Stability and safety: The product is tested for physical stability over time and checked for skin irritation potential.

- Olive Oil

Olive oil in shampoo helps to moisturize and strengthen hair due to its high content of fatty acids, antioxidants, and vitamins. The manufacturing process generally involves combining the oil or its standard shampoo ingredients to create a stable, effective product.

Contents

Olive oil is rich in beneficial compounds that improve hair health:

Emollients: The primary components are oleic acid, palmitic acid, and squalene, which have softening qualities and help lock in moisture.

Antioxidants: It contains vitamin A,C,E, and K, which help protect the hair and scalp from oxidative stress and environmental damage.

Nutrients: Proteins and lipids in the oil help nourish the hair shaft and improve elasticity, reducing breakage and split ends.

Shampoos containing olive oil are often formulated with a low percentage (e.g.., 1% w/w of olive leaves extract in one study) of the active ingredient or its derivatives to provide benefits without making the hair greasy. The concentration is carefully balanced, as the oil's thick consistency can weigh down thinner hair types.

Processes

The general process for formulating a shampoo containing olive oil derivatives is a water-based blend method that involves several steps:

1. **Weighing Ingredients**: Raw materials, including surfactants, water, olive oil components, preservatives, and perfumes, are weighed according to the specific formula.
2. **Heating and Dissolving (Water Phase**): Deionized water is heated (typically to 70 degree celcius-90 degree celcius)., and water-soluble ingredients like conditioning polymers and thickeners are dissolved.
3. **Mixing (Oil Phase**): Fatty acids, olive oil derivatives (e.g., sodium PEG-7 olive oil carboxylate ,PEG-7 olivate), and other oil soluble components are combined and mixed.
4. **Emulsification:** The water and oil phases are combined, often using a vacuum emulsification process with stirring to ensure uniform dispersion and stability of the mixture, preventing phase separation.
5. **Cooling and Additives:** The mixture is cooled down, and sensitive ingredients like perfumes, preservatives, and sodium chloride (for viscosity adjustment) are added at a lower temperature (around 45 degree celcious).
6. **Ph Adjustment**: The final Ph is adjusted (usually to 6.0-7.5) using an agent like citric acid to be suitable for the scalp and hair.

❖ **Evaluation parameters of Herbal Shampoo**

1.Physical appearance:

The attractiveness of shampoos to consumers is often judged visually. Factors such as clarity, color, and odor contribute to the overall physical appearance of the formulation.

2.pH:

The pH levels of the shampoo, tested in 1% and 10% aqueous solutions, were measured using a calibrated pH meter at room temperature (25 ± 2 °C).

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4. Dirt dispersion:

A 1% shampoo solution was prepared using distilled water. From this, 10 mL of the diluted shampoo was transferred into a test tube, and one drop of India ink was added. The test tube was stoppered and shaken 10 times. The amount of ink dispersed in the foam was then evaluated and recorded as *none*, *light*, *moderate*, or *heavy*. Shampoos that allow the ink to concentrate in the foam are considered to be of poor quality. Ideally, the dirt (ink) should remain in the water phase; dirt retained in the foam is difficult to rinse off and can be redeposited on the hair.

4.Foaming ability and foam stability:

The cylinder shake method, a widely used procedure for assessing foaming properties, was employed to evaluate the shampoo. At room temperature, 50 mL of the shampoo solution was transferred into a 250-mL graduated cylinder, which was then covered by hand and shaken 10 times. The total foam volume after 60 seconds was recorded, and the initial foam height was measured immediately.

To assess foam stability, the same procedure was repeated, and the foam volume remaining after 20 minutes was recorded.

5. Percentage of solid contents:

Four grams of the formulated shampoo was transferred into a clean, dry evaporating dish. The dish containing the sample was weighed on an electronic balance, and the weight was recorded as $\mathbf{W_1}$. The dish was then placed in a hot-air oven at 50 °C and heated until all liquid content had evaporated completely. After cooling to room temperature, the dish containing the remaining solid residue was weighed again and recorded as $\mathbf{W_2}$.

The percentage of solid content was calculated using the formula:

% Solid Content=(W1−W2)W1×100\% \text{ Solid Content} = \frac{(W₁ - W₂)}{W₁} \times 100% Solid Content=W1(W1−W2)×100

6..Measurement of surface tension:

Surface tension was determined using a stalagmometer by the drop count method. This technique measures the cohesive forces within a liquid, which influence the number of drops formed as the liquid flows through the stalagmometer. Liquids with stronger cohesive forces, such as water, exhibit higher surface tension and therefore produce fewer, larger drops. Conversely, liquids with weaker cohesive forces produce more, smaller drops. The surface tension of the shampoo solution was calculated by comparing the number of drops of the test sample to that of a reference liquid (typically distilled water).

Liquids such as benzene have weak cohesive forces and therefore exhibit lower surface tension compared to water. The lower the surface tension of a liquid, the smaller the size of the drops formed; as a result, a greater number of drops is produced from the same volume. Thus, by simply counting the number of drops formed by an unknown liquid and comparing it with the number of drops formed by water under identical conditions, the surface tension of the unknown liquid can be calculated

7.Skin irritation test

A skin irritation test was performed by applying the prepared polyherbal anti-dandruff shampoo to a small area of skin for 5 minutes. The area was then washed, and the skin was observed for any signs of irritation or inflammation.

8 .Washability

The washability of the shampoo was evaluated by applying a small amount to the hands, followed by rinsing with water to determine how easily the product could be removed.

9.wetting time

Wetting time, which indicates how quickly a substance becomes wet when in contact with a liquid, is influenced by the substance's concentration. While Drave's test is recognized as the official method for measuring wetting time, the canvas disc method is often preferred in practice because it is easier and quicker to perform.

For the wetting time measurement, a smooth, circular canvas paper disc was gently placed on the surface of the herbal shampoo solution. A stopwatch was started immediately, and the time taken for the disc to start sinking into the solution was recorded as the wetting time. This method provides a simple and time-saving assessment of the shampoo's wetting properties.

10. **Stability Studies:**

The stability of the herbal formulations was evaluated in accordance with the International Council for Harmonisation (ICH) guidelines. The formulations were assessed for various parameters, including physical appearance, percentage of solid content, transparency, and pH. These evaluations were performed at predetermined intervals to monitor any changes over time, ensuring the formulations maintained their quality, efficacy, and safety throughout the study period.

❖ Evaluation of herbal shampoo

To evaluate the prepared formulations, quality control tests including visual assessment and physicochemical controls such as pH, density and foaming were performed.

1.Organoleptic properties: Visual inspection of the product indicated that it was of acceptable appearance, with a uniform color, consistency, and no visible signs of separation or particulate matter.

Colour - Brown
 Odour - Aromatic
 State - Liquid
 Consistency - Viscous

Organoleptic properties of Herbal shampoo

2.Determination of pH-: The pH of formulated shampoo was 6.2. A formulated shampoo is acid balanced which is near to the skin pH. The pH of shampoo is important for improving and enhancing the qualities of hair, minimizing irritation to the skin and stabilizing the pH balance of the scalp. Mild acidity prevents swelling and promotes tightening of the scales, there by inducing shine.

PH determination of prepared herbal shampoo

3.Foaming Stability-: 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 50 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

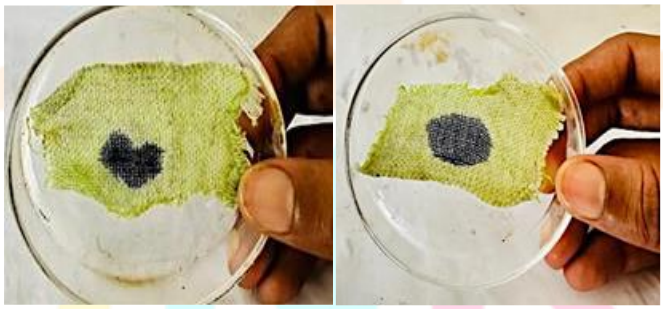
min, respectively. The total foam volume was measured after 1 min of shaking. From the consumer point of view, foam stability is one of the important needs of a shampoo. The foam volume produced by the formulated shampoo is above 10 ml. The prepared shampoo generates uniform, small sized, compact, denser, and stable foam

Foaming test of prepared herbal shampoo

4. Solid contents (%) -: A Clean dry china dish was weighed and 4 grams of shampoo was added to it. The weight of dish and shampoo was noted. The exact weight of shampoo was calculated. Place the china dish with herbal shampoo on hot plate until the liquid portion was evaporated. The weight of shampoo (solids) after drying was calculated

Determination of Surface tension using Stalagmometer

5.Cleaning action-: About 1 g of grease is spread on non-adsorbent cotton and kept in conical flask containing 1% shampoo solution. The conical flask is shaken for 1 hr in mechanical shaker. Cotton is collected, dried and weighed. The amount of grease removed is determined by observation.



Determination of cleaning action of Herbal shampoo

6. Surface Tension-: Measurements were carried out with a 10% shampoo dilution in distilled water at room temperature. Thoroughly clean the stalagmometer using chronic acid and purified water because surface tension is highly affected with grease or other lubricants and after cleaning determine the surface tension

Determination of Surface tension using Stalagmometer

❖ Advantages

- **Stimulates the scalp** to support healthy hair growth.
- **Strengthens and improves elasticity** of dry, brittle strands.
- **Reduces breakage**, helping hair become more resilient.
- **Protects against future damage**, including breakage and split ends.
- **Leaves hair shiny, soft, and manageable** for improved overall appearance and feel.
- **Lowers Risk of Side Effects** – Herbal supplements are generally well-tolerated, especially for individuals who may be allergic to certain components in prescription drugs.
- Provides Symptomatic Relief
- Cost-Effective
- Readily Available
- Treats Chronic Condition

DISADVANTAGES

- It fades the texture and shine.
- It can make your hair dry and frizzy.
- It dries out the scalp.
- You may also experience dandruff.
- You can experience breakage.
- It causes more split ends.

❖ Result

Herbal shampoo was preparedand evaluated

Sr.no	parameters	Observations
1.	Color	Brownish
2.	Odour	Pleasant
3.	Appearance	Turbid
4.	Texture	Gritty
5.	Foaming Index	500
6.	Dirt Dispersion test	Light
7.	% solid content	8.25%

❖ Conclusion

The applications and significance of herbal shampoos are the primary focus of this review. Given the widespread belief that herbal products are safe and free from adverse effects, the review also highlights the growing awareness and demand for cosmetics containing herbal ingredients. It further discusses the types, preparation methods, and evaluation of polyherbal shampoos.

The formulated shampoo is not only safer than chemical conditioning agents but also significantly reduces hair loss and strengthens hair growth. The pH of the shampoo was adjusted to 6.2 to maintain the natural acidity of the scalp. Synthetic preservatives have sometimes been associated with adverse effects in consumers.

Herbal shampoos are formulations used for washing and cleansing the hair while also providing nourishment.

The purpose of this study was to develop a fully herbal shampoo comparable to the synthetic shampoos currently available on the market. We formulated the herbal shampoo using plant extracts that are widely used in traditional Asian medicine and are well known for their effective hair-cleansing properties.

Evaluation studies showed favorable results in terms of appearance, washability, skin non-irritancy, foam stability, dirt-dispersion activity, antimicrobial activity, rheological properties, and surface-tension measurements.

The herbal shampoo was formulated using powders of medicinal plants traditionally used for cleansing and smoothing the hair Herbal shampoos for hair growth are made to strengthen the hair follicles by giving essential oils and nourishment all through the root and follicles. This, in turn, promotes hair growth and stimulates

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