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Formulation and Evaluation of Polyherbal Anti-Dandruff Shampoo

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Abstract: *A liquid or semi-solid preparation of soap or detergent used for cleansing hair is known as a shampoo. Shampoos are primarily designed to remove surface grease, dirt, dandruff, and environmental pollutants from the hair shaft and scalp. Shampooing is one of the most common and essential practices for maintaining hair hygiene and scalp health. An ideal shampoo not only cleanses effectively but also maintains the natural balance of the scalp without causing irritation or damage. In the present scenario, most commercially available shampoos contain synthetic chemicals such as surfactants, preservatives, and antifungal agents, which may lead to side effects like scalp irritation, dryness, and hair damage on prolonged use. Due to increasing awareness regarding the safety and environmental impact of synthetic products, there is a growing interest in herbal or natural shampoos.Herbal shampoos are formulated using plant-based ingredients such as neem, aloe vera, reetha, and essential oils, which possess antifungal, antibacterial, and conditioning properties. These formulations are considered safer, biodegradable, and more compatible with the human scalp. However, despite their advantages, herbal shampoos are still less popular among consumers due to expectations of high foaming, instant results, and aesthetic appeal similar to synthetic products. The present study focuses on the formulation and evaluation of a polyherbal anti-dandruff shampoo by eliminating harmful synthetic ingredients and replacing them with safer natural alternatives. The prepared formulation was evaluated for various physicochemical parameters such as pH, viscosity, foam stability, and cleansing ability. Additionally, the antifungal potential of the formulation against dandruff-causing organisms like Malassezia was considered.*

Keywords: Herbal shampoo, formulation, evaluation, physicochemical properties, antifungal activity, natural ingredients

I. INTRODUCTION

Anti-Dandruff Shampoo is a cosmetic preparation used for cleaning the hair and scalp. It is usually available in the form of a liquid, cream, gel, or lotion and is formulated using soaps or synthetic detergents. The primary purpose of shampoo is to remove accumulated dirt, excess oil (sebum), sweat, and environmental impurities from the hair and scalp without disturbing their natural balance.

Hair care is an essential part of personal hygiene, and shampooing is the most widely practiced method for maintaining clean and healthy hair. An ideal shampoo should effectively cleanse the scalp while preserving enough natural oil to keep the hair soft, smooth, and manageable. Excessive removal of sebum can lead to dryness, whereas inadequate cleansing can result in greasy and unhealthy hair.

The term “shampoo” is derived from the Hindi word “champoo,” which means to massage. Traditionally, herbal ingredients were used for hair cleansing and nourishment. However, with the advancement of cosmetic science, synthetic shampoos became more popular due to their high foaming ability, ease of use, and immediate results. Despite these advantages, synthetic shampoos often contain chemicals that may cause irritation, dryness, or long-term damage to hair and scalp.

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In recent years, there has been a growing interest in herbal shampoos due to increased awareness about the safety and environmental impact of synthetic ingredients. Herbal shampoos are formulated using natural plant-based materials that are gentle on the scalp and provide additional therapeutic benefits. However, consumer preference is still largely influenced by factors such as foam formation, fragrance, and instant results. Therefore, promoting herbal shampoos requires a shift in consumer perception, focusing more on safety, long-term benefits, and effectiveness rather than just cosmetic appeal.

A typical shampoo formulation contains multiple ingredients such as surfactants, conditioning agents, preservatives, fragrances, and additives. These components work together to ensure proper cleansing, stability, and user satisfaction.

History in the World:

The use of herbs for hair cleansing and dandruff treatment began thousands of years ago in ancient civilizations. Early societies in Egypt, China, Greece, and Rome used plant extracts, oils, and natural materials to maintain scalp hygiene and healthy hair. Herbs with antifungal and cleansing properties were commonly used to reduce scalp infections and dandruff-like conditions.

In ancient China, herbal preparations made from tea leaves, rice water, and medicinal plants were used for hair cleansing and scalp nourishment. Similarly, Egyptian civilization used aromatic oils and herbs for personal grooming and scalp care. These traditional methods formed the foundation for modern herbal hair care products.

During the nineteenth and early twentieth centuries, synthetic shampoos became popular because they produced rich foam and provided quick cleansing action. However, continuous use of chemical-based shampoos led to problems such as dryness, scalp irritation, hair fall, and allergic reactions. As a result, researchers and consumers started searching for natural and safer alternatives.

The concept of polyherbal formulations gained importance because combining several herbs provided better therapeutic effects than using a single herb alone. Different herbs offered multiple benefits such as antifungal activity, scalp conditioning, nourishment, and hair strengthening. Polyherbal anti-dandruff shampoos were developed using herbs known for controlling fungal growth, especially against *Malassezia*, the fungus commonly associated with dandruff.

In recent decades, awareness regarding herbal cosmetics and eco-friendly products has increased worldwide. Many countries now promote herbal shampoos due to their lower risk of side effects and biodegradable nature. Scientific studies have also supported the effectiveness of herbal ingredients such as tea tree oil, aloe vera, neem, and hibiscus in reducing dandruff and maintaining scalp health.

History in India:

India is considered one of the earliest countries to use herbal hair care preparations. The origin of shampoo itself comes from the Hindi word “chāmpo” or “champi,” meaning massage. Traditional Indian hair care practices involved oil massage followed by cleansing with herbal ingredients like reetha, shikakai, amla, neem, hibiscus, and fenugreek.

Ayurveda, the ancient Indian system of medicine, played a major role in the development of herbal anti-dandruff treatments. Ayurvedic texts described the use of medicinal plants for treating scalp infections, itching, dandruff, and hair fall. Herbs such as neem and tulsi were valued for their antimicrobial properties, while amla and bhringraj were used to strengthen hair roots and improve hair growth.

Before the introduction of commercial shampoos, Indian households commonly prepared homemade herbal hair cleansers by boiling reetha, shikakai, and amla in water. These preparations acted as natural shampoos and were widely used in rural and urban areas alike.

During the British colonial period, Indian hair cleansing practices became known in Europe, and the term “shampoo” entered the English language. In the twentieth century, synthetic shampoos became more common in India because of industrialization and aggressive marketing by cosmetic companies.

However, due to increasing awareness about the harmful effects of excessive chemicals, the popularity of herbal and Ayurveda shampoos began rising again. Indian researchers and pharmaceutical institutions started developing

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polyherbal anti-dandruff shampoos using combinations of traditional medicinal plants. Scientific studies in India focused on evaluating properties such as pH, foam stability, antimicrobial activity, dirt dispersion, and skin compatibility of these formulations.

The demand for polyherbal anti-dandruff shampoos increased rapidly during the late twentieth and early twenty-first centuries. Consumers became more conscious about the side effects of synthetic chemicals such as sulfates, parabens, and artificial preservatives. Problems like scalp irritation, excessive dryness, hair fall, and allergic reactions encouraged people to shift toward herbal alternatives. As a result, cosmetic and pharmaceutical industries started investing in research and development of herbal shampoo formulations.

Polyherbal shampoos gained importance because a combination of herbs provides multiple benefits at the same time. For example, neem and tea tree oil help control fungal growth responsible for dandruff, while aloe vera moisturizes the scalp and hibiscus strengthens the hair. Reetha acts as a natural cleansing agent, whereas amla provides nourishment through vitamins and antioxidants. The synergistic effect of these herbs improves the overall effectiveness of the shampoo.

In India, Ayurveda companies played a major role in popularizing polyherbal shampoos. Traditional Ayurveda knowledge was combined with modern cosmetic technology to produce safe, stable, and effective formulations. Herbal shampoos became available in various forms such as liquid, gel, cream, and powder. Manufacturers also introduced specialized products for dandruff control, hair fall prevention, scalp nourishment, and damaged hair repair.

Scientific research has further strengthened the popularity of polyherbal anti-dandruff shampoos. Researchers evaluate these formulations through tests such as pH determination, foam stability, antimicrobial activity, dirt dispersion, viscosity, and skin irritation studies. Clinical studies have shown that many herbal ingredients possess antifungal, antibacterial, anti-inflammatory, and antioxidant properties that help maintain healthy scalp conditions.

The increasing use of natural and biodegradable ingredients has also made polyherbal shampoos environmentally friendly. Unlike many synthetic chemicals, herbal ingredients are generally biodegradable and produce less environmental pollution. This has increased consumer preference for eco-friendly cosmetic products worldwide.

Today, polyherbal anti-dandruff shampoos are widely used across the world and are considered an important part of herbal cosmetic science. Continuous research and innovation are helping in the development of advanced herbal formulations that provide effective dandruff control with minimal side effects.

Structure and Function of Hair:

To understand the role of shampoo, it is important to understand the basic structure of hair. Human hair is mainly composed of a protein called keratin. Each strand of hair has three major layers: the cuticle, cortex, and medulla. The outermost layer, known as the cuticle, protects the inner structure of the hair and contributes to its shine and smoothness. The cortex provides strength, elasticity, and color to the hair, while the medulla forms the innermost core.

The scalp contains sebaceous glands that produce sebum, a natural oily substance that keeps hair moisturized and protected. Sebum acts as a natural conditioner and prevents the hair from becoming dry and brittle. However, excessive sebum production can trap dirt and microorganisms, leading to dandruff, itching, and scalp infections. Shampoo plays a crucial role in maintaining the balance between cleanliness and natural oil retention.

Environmental pollution, exposure to sunlight, dust, sweat, and the frequent use of styling products can negatively affect hair health. Hair may become rough, dull, weak, and more prone to breakage if not cleaned regularly. Therefore, proper hair cleansing using a suitable shampoo is essential for maintaining healthy and attractive hair.

Benefits of Shampoo:

1. Shampoo helps remove dirt, dust, sweat, excess oil, and environmental impurities from the hair and scalp, keeping them clean and fresh.
2. It controls excess sebum produced by the scalp, preventing greasy and sticky hair.
3. Medicated and anti-dandruff shampoos help reduce flakes, itching, and irritation of the scalp.
4. Shampoo makes hair look soft, shiny, smooth, and manageable, improving overall appearance.

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5. Most shampoos contain pleasant fragrances that leave the hair smelling fresh and clean.
6. Many shampoos contain vitamins, proteins, and herbal extracts that help nourish and strengthen hair roots.
7. Conditioning shampoos reduce tangling and make hair easier to comb and style.
8. Specialized shampoos help protect hair from pollution, sunlight, and damage caused by chemicals and styling products.
9. Herbal and nutrient-rich shampoos support scalp health, which may help promote healthy hair growth.
10. Different shampoos are available for dry, oily, damaged, colored, and sensitive hair, allowing.
11. Clean and healthy hair improves personal grooming, appearance, and self-confidence.

Types of Shampoos:

1. Regular Shampoo

Regular shampoos are designed for routine cleansing and are suitable for normal hair. They contain mild surfactants that remove dirt and oil without causing excessive dryness.

2. Anti-Dandruff Shampoo

These shampoos contain active ingredients such as zinc pyrithione, ketoconazole, selenium sulfide, or coal tar to control dandruff and scalp irritation. They help reduce flaking, itching, and fungal growth on the scalp.

3. Herbal Shampoo

Herbal shampoos are prepared using natural plant extracts such as neem, aloe vera, hibiscus, reetha, and amla. They are considered safer and milder than synthetic shampoos and often provide nourishment along with cleansing.

4. Conditioning Shampoo

Conditioning shampoos contain ingredients that soften and moisturize the hair. They are useful for dry, damaged, or chemically treated hair and help improve manageability and shine.

5. Baby Shampoo

Baby shampoos are specially formulated to be mild and non-irritating. They usually have a neutral pH and do not cause eye irritation.

6. Medicated Shampoo

Medicated shampoos are used to treat scalp disorders such as psoriasis, seborrheic dermatitis, fungal infections, and severe dandruff. These products are often recommended by dermatologists.

7. Dry Shampoo

Dry shampoos are available in powder or spray form and are used without water. They absorb excess oil from the scalp and provide a refreshed appearance between regular washes.

Ingredients Used in Shampoo Formulation:

The effectiveness of shampoo depends on the quality and combination of ingredients used in its formulation. Each ingredient has a specific function that contributes to cleansing, foaming, conditioning, preservation, or aesthetic appeal.

Surfactants

Surfactants are the primary cleansing agents in shampoos. They reduce the surface tension of water and help remove dirt and oil from the hair and scalp. Common surfactants include sodium lauryl sulfate, sodium Lauretha sulfate, and ammonium lauryl sulfate.

Conditioning Agents

Conditioning agents improve the texture and softness of hair. Ingredients such as silicones, proteins, oils, and quaternary ammonium compounds reduce friction and make hair easier to comb.

Thickeners

Thickeners are added to improve the consistency and appearance of shampoo. Examples include cellulose derivatives and natural gums.

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Preservatives

Preservatives prevent microbial contamination and extend the shelf life of the product. Common preservatives include parabens, formaldehyde releasers, and organic acids.

Fragrances and Colors

Fragrances provide a pleasant smell, while colors improve the visual appeal of the product. These additives increase consumer acceptance and market value.

PH Adjusters

The pH of shampoo is maintained within a suitable range to protect the scalp and hair cuticle. Citric acid and sodium hydroxide are commonly used for pH adjustment.

Ideal Properties of Shampoo:

An ideal shampoo should possess the following characteristics:

1. It should clean the hair and scalp effectively.
2. It should produce adequate foam for user satisfaction.
3. It should leave the hair soft, smooth, and shiny.
4. It should be non-irritating to the scalp, skin, and eyes.
5. It should be easily washable with water.
6. It should impart a pleasant fragrance to the hair.

Functions of Shampoo:

The main functions of shampoo include:

1. Removal of dirt, oil, and impurities from hair and scalp.
2. Maintenance of scalp hygiene.
3. Providing conditioning effect to hair.
4. Producing foam to enhance cleaning efficiency.
5. Improving appearance and manageability of hair.
6. Preventing scalp disorders such as dandruff.

Classification of Shampoo:

1. Based on Physical Form (Appearance)

- Powder shampoo
- Liquid or lotion shampoo
- Gel or solid shampoo
- Cream shampoo
- Oil-based shampoo
- Medicated or anti-dandruff shampoo

2. Based on Function or Use

- Conditioning shampoo
- Anti-dandruff shampoo
- Therapeutic shampoo
- Baby shampoo
- Balancing shampoo
- Clarifying shampoo

3. Based on Origin

- Herbal shampoo
- Egg shampoo

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INGREDIENT USED IN SHAMPOO:

1. Neem/Neem Powder – Azadirachta indica

Fig No 1 : Neem/Neem Powder

Neem *(Azadirachta indica),* belonging to the family Meliaceae, is an important medicinal plant widely used in herbal cosmetic formulations. It contains active compounds such as azadirachtin, nimbidin, and quercetin, which provide antifungal, antibacterial, anti-inflammatory, and antioxidant properties. Neem is especially effective in controlling dandruff by inhibiting the growth of fungi such as *Malassezia,* thereby reducing scalp irritation and flaking., neem helps in maintaining scalp hygiene by removing excess oil, dirt, and impurities. It also regulates sebum secretion and soothes the scalp by reducing itching and inflammation. Neem strengthens hair roots, improves hair texture, and promotes healthy hair growth. Due to its natural origin, safety, and compatibility with other ingredients, neem is widely used in shampoo formulations as a key component for improving scalp health and hair quality. In addition to these benefits, neem also possesses mild conditioning properties that help in improving hair manageability and reducing dryness caused by frequent washing. Its natural compounds support the maintenance of scalp pH balance, which is essential for preventing microbial growth and maintaining healthy hair follicles. Regular use of neem-based shampoo formulations can contribute to stronger, shinier, and more resilient hair while minimizing the risk of scalp infections.

2. Aloe vera (*Aloe barbadensis)*

Fig No 2: Aloe Vera

Aloe vera *(Aloe barbadensis),* belonging to the family Liliaceae, is a widely used medicinal plant known for its soothing and healing properties. The gel obtained from the inner part of its leaves contains various bioactive compounds such as aloin, aloe-emodin, vitamins, enzymes, amino acids, and polysaccharides, which contribute to its

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therapeutic effects. Aloe vera exhibits moisturizing, anti-inflammatory, antimicrobial, and antioxidant properties, making it highly suitable for use in hair care formulations. In shampoo preparations, aloe vera helps to maintain scalp hydration by retaining moisture and preventing dryness. It also soothes irritated scalp conditions by reducing redness, itching, and inflammation, which are commonly associated with dandruff and other scalp disorders.In addition to its calming effects, aloe vera supports healthy hair growth by nourishing the hair follicles and improving blood circulation to the scalp. It helps in strengthening the hair roots, reducing hair breakage, and enhancing overall hair texture and shine. Aloe vera also contributes to maintaining the natural pH balance of the scalp, which is important for preventing microbial growth and maintaining scalp health. Due to its gentle and non-irritating nature, it is suitable for all hair types, including sensitive scalp conditions. Furthermore, aloe vera is easy to incorporate into shampoo formulations in the form of fresh gel or extract and shows good compatibility with other herbal ingredients. Therefore, it is considered an essential component in herbal shampoos, providing both therapeutic and conditioning benefits for healthy hair and scalp.

3. Reetha – *Sapindus mukorossi*

Fig No 3: Reetha

Reetha (*Sapindus mukorossi*), commonly known as soapnut, belongs to the family Sapindaceae and is widely used as a natural cleansing agent in traditional hair care practices. The dried fruit of reetha contains high amounts of saponins, which are natural surface-active agents responsible for its cleansing and foaming properties. These saponins reduce surface tension and help in the removal of dirt, oil, and impurities from the hair and scalp without causing damage to natural hair oils. Due to this property, reetha serves as an effective and mild alternative to synthetic surfactants in shampoo formulations.In addition to its cleansing action, reetha also exhibits antimicrobial and antifungal properties, which help in maintaining scalp hygiene and preventing dandruff. It gently cleanses the scalp without causing irritation, making it suitable for regular use and for individuals with sensitive skin. Reetha also helps in improving hair texture by making it soft, smooth, and manageable. Unlike harsh chemical detergents, it does not strip away essential oils from the scalp, thereby maintaining natural moisture balance.From a formulation point of view, reetha is commonly used in the form of decoction, extract, or powder in herbal shampoos. It produces moderate foam, which may be less compared to synthetic shampoos but is sufficient for effective cleansing. Its natural origin, biodegradability, and safety make it an important component in polyherbal shampoo formulations. Therefore, reetha plays a crucial role in providing gentle cleansing, improving scalp health, and enhancing the overall quality of herbal shampoo preparations.

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4. Rosemary oil :

Fig No 4 : Rosemary oil

Rosemary oil is a natural essential oil obtained from the leaves of the rosemary plant, scientifically known as *Rosmarinus officinalis*. It has been widely used in herbal medicine, cosmetics, and hair-care products because of its antimicrobial, antioxidant, and anti-inflammatory properties. In recent years, rosemary oil has become an important ingredient in polyherbal anti-dandruff shampoos due to its ability to improve scalp health and reduce dandruff formation.

Dandruff is a common scalp disorder characterized by itching, irritation, dryness, and white flakes on the scalp. One of the major causes of dandruff is the overgrowth of fungi such as *Malassezia* species on the scalp. Rosemary oil contains active compounds such as cineole, camphor, alpha-pinene, and rosmarinic acid that help control fungal growth and reduce scalp inflammation. These properties make rosemary oil beneficial in herbal anti-dandruff formulations.

MATERIAL AND METHODS

Materials :

Ingredient	Quantity	Function
Reetha decoction	10 g	Natural cleanser
Neem extract	5 g	Antifungal
Aloe vera gel	8 g	Moisturizer
Sodium lauryl sulfate	18 g	Cleansing
Cocamidopropyl betaine	5 g	Foam booster
Glycerin	5 g	Humectant
Gur gum	0.5 g	Thickener
Rosemary oil	0.5 g	Anti-dandruff
Methyl parabean	0.5 g	Stability
Distilled water	q.s. to 100 g	Vehicle

The materials used for the formulation of polyherbal anti-dandruff shampoo consisted of both herbal ingredients and pharmaceutical excipients. Fresh neem leaves were collected and processed to obtain aqueous extract. Aloe vera gel was obtained from fresh leaves and used for its moisturizing properties. Reetha (*Sapindus mukorossi*) was used in the form of decoction as a natural cleansing agent due to the presence of saponins. Tea tree oil (*Melaleuca alternifolia*) or

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rosemary oil (*Rosmarinus officinalis*) was used as an active antifungal component. In addition to herbal ingredients, excipients such as Sodium Lauryl Sulfate (SLS) were used as the primary surfactant to provide effective cleansing action, while Cocamidopropyl betaine acted as a secondary surfactant and foam booster. Glycerin was incorporated as a humectant to retain moisture and prevent dryness of hair. Hydroxyethyl cellulose or guar gum was used as a thickening agent to improve viscosity and consistency of the shampoo. A suitable preservative such as phenoxyethanol or methyl paraben was added to prevent microbial contamination. Citric acid was used to adjust the pH of the formulation to match the natural pH of the scalp. Distilled water was used as the vehicle for preparation.

Table no. 1: Formulation Table (100gm)

Preparation of Herbal Extracts:

1) The herbal extracts were prepared using simple aqueous extraction methods. Reetha powder was boiled in distilled water for about 20 minutes to obtain a saponin-rich decoction, which was then filtered to remove solid residues. Neem leaves were dried, powdered, and boiled in water for 30 minutes, followed by filtration to obtain a clear extract. Fresh aloe vera leaves were cut open, and the inner gel was collected and homogenized to obtain a smooth consistency suitable for formulation.

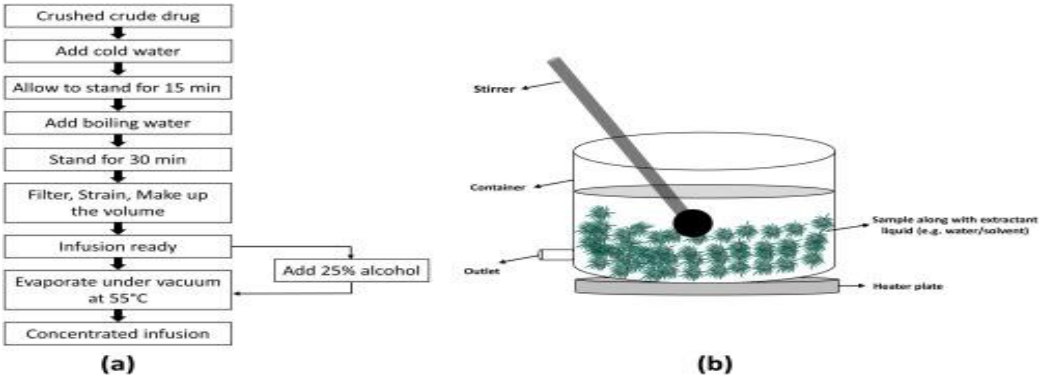

Fig No 5: Extraction Process

Preparation of Shampoo Formulation:

The formulation of the herbal shampoo was carried out by combining the prepared extracts with suitable excipients. Initially, neem extract, reetha decoction, and aloe vera gel were mixed with distilled water in a clean beaker to form the aqueous base. The mixture was stirred gently to ensure uniform distribution. After preparing the base, Sodium Lauryl Sulfate was added slowly with continuous stirring to avoid excessive foam formation. Cocamidopropyl betaine was then added to enhance foaming properties and reduce irritation caused by the primary surfactant. Glycerin was incorporated into the mixture to provide moisturizing effects. The thickening agent, either hydroxyethyl cellulose or guar gum, was separately dispersed in a small amount of water and then added to the formulation to achieve the desired viscosity. The mixture was stirred continuously until a uniform and smooth consistency was obtained.

1. Prepare reetha decoction by boiling in water.
2. Prepare neem extract by hot extraction method.
3. Extract aloe gel manually.
4. Mix aqueous extracts.
5. Add surfactants with gentle stirring.
6. Add glycerin and thickener.
7. Add tea tree oil.
8. Adjust pH to 5.5–6.0.

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9. Make final weight to 100 g

Addition of Active Ingredients and Final Adjustment:

At the final stage, tea tree oil or rosemary oil was added as the active antifungal ingredient and mixed thoroughly to ensure uniform distribution. A suitable preservative was then added to prevent microbial growth during storage.The pH of the formulation was measured using a digital pH meter and adjusted to the range of 5.5 to 6.0 using citric acid solution. Finally, distilled water was added to make up the total volume, and the formulation was mixed thoroughly to obtain a homogeneous shampoo.

Storage of Formulation:

The prepared shampoo was transferred into clean, dry, and airtight containers and stored at room temperature. The formulation was observed periodically for any changes in appearance, consistency, or stability.

EVALUATION OF PREPARED HERBAL LIQUID SHAMPOO:

To evaluate the prepared formulations, quality control tests including visual assessment and physicochemical controls such as pH, density and viscosity were performed. Also, to assure the quality of products, specific tests for shampoo formulations including the determination of dry residue and moisture content, total surfactant activity, salt content, surface tension, thermal and mechanical stability and detergency tests were carried out.

Fig No. 6: Polyherbal Anti-Dandruff Shampoo

1) Physical Appearance/Visual Inspection: The formulations prepared were evaluated in terms of their clarity, foam producing ability and fluidity

2) Determination of pH: The pH of a 10% shampoo solution prepared in distilled water was measured at room temp. (25°C) using both a pH meter and litmus paper for confirmation. The results are mentioned in table 2.

3) Foaming ability and Foam stability: The foaming capacity was assessed using the cylinder shake method. In this procedure, 50 ml of the herbal shampoo solution was transferred to a 250 ml graduated cylinder, which was then sealed with a hand and shaken vigorously 10 times. The foam volume was recorded after 1 min to determine initial foam formation. The foam stability was further evaluated by measuring the foam volume again at 1 minute and 4 minutes post-shaking. The results are mentioned in table 2.

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4) Dirt dispersion: Two drops of shampoo were introduced into a large test tube containing 10 ml of distilled water, followed by the addition of 1 ml of India ink. The test tube was tightly sealed and shaken vigorously ten times. The presence of ink within the foam was then visually assessed and categorized as None, Light, Moderate, or heavy based on the degree of ink dispersion. The results are mentioned in table 2.

5) Skin Irritation Test: A small amount of the formulated shampoo was applied to the skin and left undisturbed for 5 minutes. The site was then examined for any signs of redness, inflammation, or irritation. No adverse skin reactions such as redness or irritation were observed, indicating good skin compatibility of the product. The results are mentioned in table 2.

RESULT:

Sr. No	Parameters	Observation
1	Colour	Dark brown
2	Odor	Aromatic, Pleasant herbal fragrance
3	Texture	Smooth and Consistent
4	Appearance	Homogeneous, free from lumps
5	Determination of pH	pH: 6 – Mild and scalp-friendly
6	Foaming Ability	Good foaming capacity
7	Dirt Dispersion	Good and Effective

Table No. 2: Result of Evaluations Parameter

II. CONCLUSION

The herbal shampoo preparation was formulated based upon traditional knowledge and emphasis was to formulate a stable and functionally effective. The formulated shampoos were not only safer than the chemical conditioning agents, but also greatly reduce the hair loss during combing as well as strengthen the hair growth. The present work focused on the development of a polyherbal anti-dandruff shampoo using plant-based ingredients known for their beneficial effects on hair and scalp. The formulation was designed with the intention of minimizing the use of harsh synthetic chemicals while maintaining effective cleansing and therapeutic performance. Herbal components such as neem, aloe vera, reetha, and essential oils were selected based on their traditional use and scientifically reported properties.

The prepared shampoo demonstrated acceptable physicochemical characteristics, including suitable pH, good consistency, and satisfactory foaming ability. These parameters indicate that the formulation is appropriate for regular application and is unlikely to cause irritation to the scalp or eyes. The presence of natural cleansing agents ensured effective removal of dirt and excess oil, while conditioning components helped in improving hair texture and manageability.

The antifungal and soothing properties of the selected herbal ingredients contributed to the reduction of dandruff and scalp discomfort. The formulation also showed good stability under normal storage conditions, suggesting that it can maintain its quality over time. Although the product may not produce as much foam as some commercial shampoos, its mild nature and reduced risk of side effects make it more suitable for long-term use.

Overall, the study highlights the potential of herbal formulations in developing safe and effective hair care products. It supports the idea that natural ingredients can be successfully utilized to prepare shampoos that not only cleanse but also promote scalp health. This work can serve as a foundation for further improvement and large-scale development of herbal cosmetic products.

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