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"PREPARATION AND EVALUATION OF A POLYHERBAL ANTI-DANDRUFF SHAMPOO FOR SCALP ITCHING RELIEF WITH ANTIMICROBIAL ACTIVITY"

[1]Miss. Sakshi Pawar, [1]Miss. Ravina Pawara, *[1]Mr. Kamal Pawara, [2]Mr. Jitendra D. More

[1]Student of Final Year Bachelor of Pharmacy, Prof. Ravindra Nikam College of Pharmacy Gondur Dhule.

[2]Department of Pharmaceutical Chemistry, Prof. Ravindra Nikam College of Pharmacy Gondur Dhule.

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***Corresponding Author: Mr. Kamal Pawara**
Student of Final Year Bachelor of Pharmacy, Prof. Ravindra Nikam College of Pharmacy Gondur Dhule.

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ABSTRACT:

Dandruff is a common scalp condition that causes itching, flaking, and discomfort. The present study involves the preparation and evaluation of a polyherbal anti-dandruff shampoo using natural ingredients such as Aloe vera gel, Neem powder, Fenugreek powder, Amla powder, and Tea tree oil. These ingredients are known for their antimicrobial, antifungal, and soothing properties.

The shampoo was prepared using distilled water as a base and evaluated for parameters like pH, skin test, foaming ability, and cleansing action. The formulation showed good stability, satisfactory foaming, and effective cleansing properties. It also exhibited antimicrobial activity against dandruff-causing microorganisms.

The results suggest that the prepared polyherbal shampoo is safe, effective, and helpful in reducing dandruff and scalp itching. It can be used as a natural alternative to chemical-based shampoos.

KEYWORDS: Anti-Dandruff, Antimicrobial, Evaluation, Polyherbal.

1. INTRODUCTION:

Itching, flaking, itching, and irritation of the scalp are the hallmarks of dandruff, a common chronic scalp condition. It is mostly brought on by the growth of microorganisms like Malassezia species, along with elements like dry skin, poor hygiene, stress, and hormonal imbalance. It is frequently linked to excessive shedding of dead skin cells. Both physical comfort and self-confidence can be negatively impacted by persistent dandruff, which can cause scalp inflammation, itching, and even hair loss.

The majority of conventional anti-dandruff shampoos on the market include artificial ingredients including coal tar, zinc pyrithione, ketoconazole, and selenium sulfide. Despite the effectiveness of these agents, prolonged usage may result in adverse effects such dryness of the scalp, irritation, damage to hair, and the development of resistance. The market for safer, natural, and herbal substitutes has grown as a result of these restrictions.

A synergistic approach to treating dandruff and related scalp disorders is provided by polyherbal preparations, which blend many extracts from medicinal plants. The antibacterial, anti-inflammatory, antifungal, and calming qualities of herbal substances including neem (Azadirachta indica), aloe vera (Aloe barbadensis), fenugreek (Trigonella foenum-graecum), tea tree oil (Melaleuca alternifolia), and amla (Phyllanthus emblica) are widely recognized. Without having any negative side effects, these natural remedies aid in lowering microbial development, minimizing scalp irritation, nourishing hair, and enhancing general scalp health.

The widespread scalp condition known as dandruff is characterized by itching, irritation, and flaking of dead skin cells. It is frequently linked to the growth of microorganisms, particularly fungi, as well as elements including dry scalp, inadequate hygiene, and environmental circumstances. Despite the abundance of synthetic anti-dandruff shampoos on the market, prolonged use of them may cause irritation, dryness of the scalp, and damage to the hair.

Because herbal formulations are safe, effective, and have few adverse effects, interest in them has grown in recent years. Several plant-based components are combined in polyherbal medicines to increase medicinal effectiveness through a synergistic effect. Because of their well-known antibacterial, antifungal, anti-inflammatory, and calming qualities, natural

substances including aloe vera, neem, fenugreek, amla, and tea tree oil can be used to treat dandruff and scalp irritation.

The creation and assessment of a polyherbal anti-dandruff shampoo intended to effectively cleanse the scalp, lessen dandruff, ease itching, and demonstrate antimicrobial action is the main emphasis of this study. The formulation seeks to create a safe, efficient, and environmentally responsible substitute for traditional shampoos by combining the medicinal effects of specific botanical constituents. To guarantee the quality, safety, and effectiveness of the designed shampoo, a number of assessment parameters, including pH, viscosity, foam stability, filth dispersion, antimicrobial activity, and skin irritation tests, will be carried out. This study underscores the potential of plant-based formulations in offering comprehensive scalp and hair care as well as the growing significance of herbal cosmetics in contemporary healthcare.

2. In the present study, selected herbal ingredients play significant roles:

- Neem (Azadirachta indica) – Exhibits potent antifungal, antibacterial, and anti-inflammatory properties due to compounds like nimbidin and azadirachtin, effectively controlling dandruff-causing microorganisms.
- Aloe vera (Aloe barbadensis) – Acts as a natural moisturizer and soothing agent; it reduces scalp irritation and promotes healing.
- Fenugreek (Trigonella foenum-graecum) – Rich in proteins and nicotinic acid; helps in reducing hair fall, nourishing hair roots, and controlling dandruff.
- Tea tree oil (Melaleuca alternifolia) – Contains terpinen-4-ol, a powerful antifungal and antimicrobial agent effective against Malassezia.
- Amla (Phyllanthus emblica) – Rich in vitamin C and antioxidants; strengthens hair follicles and improves scalp health.

3. Diagrammatically Presentation of Healthy Scalp and Dandruff Scalp:

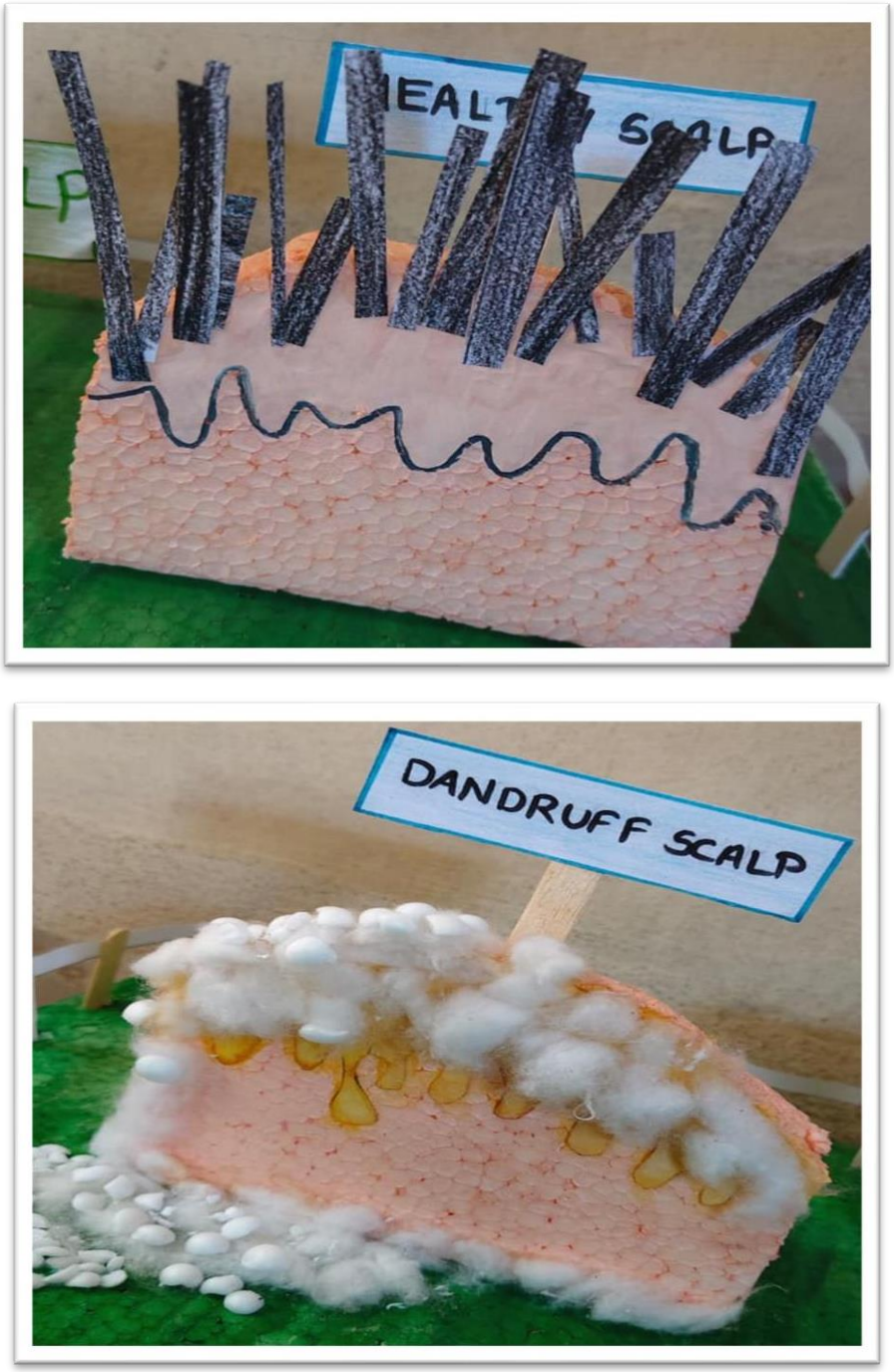

Figure No. 1 Healthy Scalp and Dandruff Scalp.

4. Formulation Profile:

Table No. 1 Formulation Ingredients.

Sr. No.	Ingredient	Quantity
1.	Aloe vera gel	20 gm.
2.	Neem powder	05 gm.
3.	Fenugreek powder	05 gm.
4.	Amla powder	10 gm.
5.	Tea tree essential oil	05 drops.
6.	Distilled water	Up to 60 ml.

5. Method of Preparation:

Collection of Raw Materials (Aloe Vera, Neem, Fenugreek, Amla, Tea Tree Oil)

↓

Preparation of Plant Extracts (Fenugreek extract, Amla extract, Neem suspension)

↓

Extraction of Aloe Vera Gel (Fresh gel → blending → filtration)

↓

Preparation of Shampoo Base (Mild herbal surfactant base + distilled water)

↓

Incorporation of Herbal Extracts (Aloe vera gel + Neem + Fenugreek + Amla)

↓

Addition of Active Ingredient (Tea Tree Oil dropwise)

↓

Homogenization (Continuous stirring / magnetic stirring)

↓

Packaging & Labeling

↓

Final Herbal Anti-Dandruff Shampoo prepared.

6. Evaluation Parameter of Anti-Dandruff Shampoo:

1. **pH**

- Should be 5 to 7 (safe for scalp)

2. **Colour & Odour**

- Colour should be uniform
- Odour should be pleasant (herbal smell)

3. **Appearance**

- Should be smooth, clear or slightly cloudy
- No lumps or separation

4. **Viscosity (Thickness)**

- Should not be too thin or too thick
- Easy to apply on hair

5. **Foam Test**

- Should produce good foam
- Foam should remain stable for some time

6. **Wetting Time**

- Shampoo should wet hair quickly

7. **Dirt Removal (Cleaning ability)**

- Should remove oil and dirt effectively

8. **Stability Test**

- Should not change colour, smell, or separate on storage

9. **Skin Safety Test**

- Should not cause itching or irritation

7. Formulation Sample of Anti-Dandruff Shampoo:

Figure No. 2 Formulation Sample of Anti-Dandruff Shampoo.

8. Applications of Polyherbal Anti-Dandruff Shampoo:

1. Treatment of Dandruff

- Helps reduce dandruff flakes from scalp
- Controls recurrence of dandruff

2. Control of Fungal Infection

- Effective against Malassezia furfur (main dandruff-causing fungus)
- Maintains healthy scalp microbiome

3. Relief from Itchy Scalp

- Soothes irritation and itching
- Provides cooling and calming effect (Aloe vera, Tea tree oil)

4. Prevention of Hair Fall due to Dandruff

- Reduces scalp infection and blockage of hair follicles
- Helps strengthen hair roots indirectly

5. Scalp Cleansing and Hygiene

- Removes excess oil, dirt, and dead skin cells
- Maintains clean scalp environment

6. Moisturizing Effect

- Prevents dryness of scalp
- Maintains natural moisture balance (Aloe vera, Fenugreek)

7. Hair Strengthening and Nourishment

- Amla improves hair strength and shine
- Supports healthy hair growth

8. Cosmetic and Herbal Personal Care Use

- Suitable for daily or regular hair care routine
- Acts as a natural alternative to synthetic shampoos

9. Sensitive Scalp Care

- Mild and less irritating compared to chemical shampoos
- Suitable for people with sensitive scalp

10. Preventive Hair Care Product

- Can be used regularly to prevent dandruff reoccurrence

9. Result of Polyherbal Shampoo:

Table No. 2 Result of Polyherbal Shampoo.

Sr. No	Parameter	Observation
1.	Color	Green in Color
2.	Oduors	Fragrant
3.	Appearance	Soft
4.	Texture	Smooth
5.	Irritation	No Irritation
6.	Solubility	Soluble in water
7.	Spread ability	Uniform
8.	Stability	Stable at Room Temp.
9.	Consistency	Semisolid
10.	Homogenecity	Good
11.	Washability	Eazy to wash

10. Presentation of Polyherbal Anti-Dandruff Shampoo:

Figure No. 3 Presentation of Polyherbal Anti-Dandruff Shampoo.

CONCLUSION:

Using natural plant-based ingredients like aloe vera, neem, tea tree oil, fenugreek, and amla, the current study was successfully completed to formulate and assess a polyherbal anti-dandruff shampoo. The study's primary goal was to create a synthetic anti-dandruff shampoo substitute that is safe, efficient, and environmentally friendly while having fewer adverse effects and more therapeutic advantages.

The shampoo's formulation demonstrated acceptable physicochemical properties, such as a pH that is in line with the natural environment of the scalp and helps to avoid irritation. It was discovered that the formulation's viscosity was perfect, guaranteeing simple application and even dispersion throughout the scalp and hair.

The shampoo's effective cleaning action and consumer appeal were demonstrated by its good foaming ability and foam stability. Effectively lowering surface tension improves wetting qualities and facilitates the elimination of oil, debris, and dandruff flakes from the scalp. Good surfactant performance was confirmed by the wetting time, which was also determined to be excellent.

Basic skin irritation tests also revealed that the product was safe for topical application and non-irritating. Its natural makeup lessens the possibility of negative side effects that are frequently connected to synthetic shampoos. Overall, the study finds that the polyherbal anti-dandruff shampoo is a stable, safe, effective, and eco-friendly composition. In addition to encouraging good hair and scalp care, it can be regarded as a viable herbal substitute for dandruff treatment and prevention.

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