

Herbal Shampoo Used to Treat Dandruff: A Review

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Abstract: *Dandruff is one of the most common scalp disorders affecting millions of individuals worldwide. It is characterised by excessive shedding of dead skin cells from the scalp, accompanied by itching and irritation. Synthetic anti-dandruff shampoos are effective but may cause side effects such as dryness, irritation, and hair damage with prolonged use. Herbal shampoos have gained popularity due to their natural origin, safety, and therapeutic benefits. Herbal ingredients such as neem, aloe vera, hibiscus, tea tree oil, tulsi, fenugreek, amla, and shikakai possess antifungal, anti-inflammatory, antioxidant, and conditioning properties that help in dandruff treatment. This review discusses dandruff, its causes, symptoms, conventional treatments, and the importance of herbal shampoos in dandruff management. It also highlights various medicinal plants used in herbal shampoo formulations, their mechanisms of action, evaluation parameters, advantages, limitations, and prospects.*

Keywords: Dandruff, Herbal shampoo, Medicinal plants, Anti-dandruff activity, Scalp disorders, Natural cosmetics.

I. INTRODUCTION

Hair contributes significantly to human appearance and self-confidence. Maintaining scalp hygiene is essential for healthy hair growth and prevention of scalp disorders. Dandruff is a chronic scalp condition characterized by flaking, itching, and irritation of the scalp [1]. It affects nearly half of the global population after puberty.

Several factors such as fungal infection, excessive sebum secretion, poor hygiene, stress, hormonal imbalance, environmental pollution, and nutritional deficiencies contribute to dandruff formation [2]. Conventional anti-dandruff shampoos contain synthetic chemicals like ketoconazole, zinc pyrithione, selenium sulfide, and coal tar. Although these agents are effective, prolonged use may result in dryness, scalp irritation, and hair damage [3].

The growing awareness regarding herbal products has increased interest in herbal shampoos. Herbal shampoos are formulations containing plant extracts with cleansing, conditioning, and therapeutic activities. They are considered safer, biodegradable, and suitable for long-term use. Herbal ingredients such as neem, aloe vera, amla, hibiscus, shikakai, and tea tree oil help in reducing dandruff naturally while improving hair quality [4].

II. DANDRUFF

2.1 Definition

Dandruff is a non-inflammatory scalp disorder characterised by excessive shedding of dead skin cells from the scalp [5].

2.2 Causes of Dandruff

2.2.1 Fungal Infection

The fungus *Malassezia* plays a major role in dandruff development. It breaks down scalp oils into irritating fatty acids that increase scalp cell turnover [6].

2.2.2 Excess Sebum Production

Excess oil secretion provides a favourable environment for fungal growth.



2.2.3 Dry Scalp

Dryness causes flaking and itching, especially during winter.

2.2.4 Poor Hair Hygiene

Improper cleansing leads to the accumulation of dead cells and oil.

2.2.5 Stress and Hormonal Changes

Psychological stress and hormonal imbalance can worsen dandruff.

2.2.6 Nutritional Deficiency

Deficiency of zinc, vitamins, and essential fatty acids may contribute to dandruff.

III. SYMPTOMS OF DANDRUFF

- White or yellow flakes on the scalp
- Itching
- Dry scalp
- Redness and irritation
- Hair fall due to scratching
- Oily scalp in some individuals [7]

IV. CONVENTIONAL TREATMENT OF DANDRUFF

Agent	Mechanism	Side Effects
Ketoconazole	Antifungal action	Dryness
Zinc pyrithione	Reduces fungal growth	Irritation
Selenium sulfide	Reduces scalp turnover	Hair discoloration
Coal tar	Slows skin cell growth	Strong odor
Salicylic acid	Removes flakes	Dry scalp

Although these treatments are effective, prolonged use may produce adverse effects [8].

V. HERBAL SHAMPOO

5.1 Definition

Herbal shampoo is a cosmetic preparation containing herbal extracts used for cleansing hair and treating scalp disorders naturally [9].

5.2 Advantages of Herbal Shampoo

- Fewer side effects
- Eco-friendly and biodegradable
- Provides nourishment to hair
- Safe for long-term use
- Improves hair texture and shine
- Possesses antimicrobial properties [10]

5.3 Characteristics of Ideal Herbal Shampoo

- Good cleansing action
- Stable foam formation
- Pleasant fragrance
- Non-irritant
- Proper viscosity



- Effective anti-dandruff activity

VI. HERBS USED IN ANTI-DANDRUFF HERBAL SHAMPOO

6.1 Neem (*Azadirachta indica*)

Neem possesses strong antifungal and antibacterial activities due to compounds such as azadirachtin and nimbidin [11].

Benefits

- Controls fungal growth
- Reduces itching
- Prevents scalp infection
- Cleanses scalp naturally

6.2 Aloe Vera (*Aloe barbadensis*)

Aloe vera contains vitamins, enzymes, amino acids, and minerals that soothe and moisturise the scalp [12].

Benefits

- Reduces irritation
- Hydrates dry scalp
- Promotes healthy hair
- Provides cooling effect

6.3 Hibiscus (*Hibiscus rosa-sinensis*)

Hibiscus acts as a natural conditioner and improves scalp health [13].

Benefits

- Prevents dryness
- Reduces hair fall
- Improves hair texture
- Strengthens roots

6.4 Shikakai (*Acacia concinna*)

Shikakai contains natural saponins that gently cleanse hair without damaging scalp oils [14].

Benefits

- Mild cleansing action
- Maintains scalp pH
- Prevents dandruff recurrence
- Improves softness

6.5 Amla (*Phyllanthus emblica*)

Amla is rich in vitamin C and antioxidants that nourish the scalp and strengthen hair follicles [15].

Benefits

- Enhances hair growth
- Reduces oxidative stress
- Prevents hair fall
- Nourishes scalp

6.6 Fenugreek (*Trigonella foenum-graecum*)

Fenugreek contains proteins and lecithin that moisturize and nourish the scalp [16].



Benefits

- Controls dryness
- Reduces itching
- Conditions hair
- Supports scalp health

6.7 Tulsi (*Ocimum sanctum*)

Tulsi possesses antimicrobial and anti-inflammatory properties useful in scalp disorders.

Benefits

- Controls microbes
- Reduces inflammation
- Improves scalp circulation
- Promotes healthy hair

6.8 Tea Tree Oil (*Melaleuca alternifolia*)

Tea tree oil exhibits potent antifungal activity against dandruff-causing fungi [17].

Benefits

- Reduces fungal growth
- Cleans oily scalp
- Relieves itching
- Refreshes scalp

VII. MECHANISM OF ACTION OF HERBAL SHAMPOO

Herbal shampoos act through different mechanisms:

7.1 Antifungal Activity

Neem and tea tree oil inhibit fungal growth.

7.2 Anti-inflammatory Action

Aloe vera and tulsi reduce irritation and redness.

7.3 Moisturizing Effect

Fenugreek and aloe vera hydrate the scalp.

7.4 Antioxidant Activity

Amla protects scalp cells from oxidative damage.

7.5 Cleansing Action

Shikakai removes dirt and excess oil naturally.

VIII. FORMULATION OF HERBAL SHAMPOO

Ingredients Used

Ingredient	Function
Herbal extracts	Therapeutic effect
Surfactants	Cleansing
Preservatives	Prevent contamination
Fragrance	Improve acceptability
Conditioning agents	Improve softness
Water	Vehicle



General Preparation Method

- Preparation of herbal extracts
- Preparation of shampoo base
- Addition of extracts with stirring
- Addition of fragrance and preservatives
- Adjustment of pH
- Packaging and storage

IX. EVALUATION PARAMETERS OF HERBAL SHAMPOO

9.1 Physical Appearance

Colour, odour, and consistency are evaluated.

9.2 pH

The ideal pH should be between 5 and 7.

9.3 Foam Stability

Indicates cleansing efficiency.

9.4 Viscosity

Determines ease of application.

9.5 Dirt Dispersion Test

Evaluates cleansing ability.

9.6 Skin Irritation Test

Ensures safety for topical application [18].

X. ROLE OF HERBAL SHAMPOO IN DANDRUFF TREATMENT

Herbal shampoos provide holistic management of dandruff by:

- Reducing fungal growth
- Preventing scalp dryness
- Relieving itching
- Nourishing hair follicles
- Improving hair texture
- Reducing dandruff recurrence
- Natural ingredients provide long-term scalp protection with minimal side effects.

XI. RECENT ADVANCES IN HERBAL ANTI-DANDRUFF SHAMPOO

11.1 Nano-Herbal Formulations

Improve penetration and bioavailability of herbal actives.

11.2 Polyherbal Formulations

Combination of herbs increases therapeutic efficacy.

11.3 Sulfate-Free Herbal Shampoos

Reduce scalp irritation and maintain natural oils.

11.4 Herbal Shampoo Bars

Environmentally friendly alternatives to liquid shampoos.

XII. LIMITATIONS OF HERBAL SHAMPOO

- Short shelf life
- Difficult standardization



- Batch-to-batch variation
- Risk of microbial contamination
- Slower action compared to synthetic agents

XIII. FUTURE PROSPECTS

Future research should focus on:

- Clinical validation
- Standardisation of herbal extracts
- Advanced herbal delivery systems
- Sustainable formulations
- Identification of new phytochemicals

The combination of traditional knowledge with modern technology can improve the effectiveness of herbal anti-dandruff shampoos.

XIV. CONCLUSION

Dandruff is a common scalp disorder affecting people worldwide. Although synthetic anti-dandruff shampoos are effective, they may produce undesirable side effects with long-term use. Herbal shampoos have emerged as safer, more natural alternatives due to their antifungal, anti-inflammatory, moisturising, and antioxidant properties.

Herbs such as neem, aloe vera, hibiscus, amla, shikakai, fenugreek, tulsi, and tea tree oil are highly beneficial for managing dandruff. Herbal shampoos not only reduce dandruff but also improve scalp health and hair quality. Continued research and technological advancements are expected to increase the effectiveness and commercial importance of herbal anti-dandruff formulations.

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