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FORMULATION AND EVALUATION OF ANTIDANDRUFF SHAMPOO OF COSTUS SPECIOSUS

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ABSTRACT

Dandruff is a common scalp disorder characterized by excessive shedding of dead skin cells and is often associated with fungal infection, particularly Malassezia species. Herbal formulations have gained importance due to their safety, efficacy, and minimal side effects. The present study aimed to formulate and evaluate an antidandruff shampoo containing extract of Costus speciosus. Costus speciosus possesses antifungal, anti-inflammatory, and antimicrobial properties which may help reduce dandruff and improve scalp health. The shampoo was formulated using suitable surfactants, preservatives, and conditioning agents and evaluated for various physicochemical parameters such as pH, viscosity, foamability, foam stability, dirt dispersion, surface tension, and stability. The formulated shampoo exhibited acceptable characteristics and may serve as an effective herbal antidandruff preparation.

KEYWORDS: Costus speciosus, Antidandruff shampoo, Herbal shampoo, Malassezia, Antifungal activity, Evaluation.

INTRODUCTION

Dandruff is a chronic scalp condition characterized by itching and excessive flaking of the scalp. It affects approximately 50% of the world's population and is commonly associated with Malassezia fungal species.[1] Conventional antidandruff shampoos contain zinc pyrithione, ketoconazole, selenium sulfide, and coal tar. However, prolonged use may produce irritation, dryness, and other adverse effects.[2] Herbal formulations have emerged as safer alternatives due to the presence of natural bioactive compounds possessing antifungal and anti-inflammatory activities.[3] Costus speciosus (Family: Costaceae), commonly known as Crepe Ginger, is widely used in traditional medicine. The rhizomes contain diosgenin, flavonoids, alkaloids, and phenolic compounds exhibiting antimicrobial, antioxidant, and anti-inflammatory properties.[4] Therefore, the present work aimed to formulate and evaluate an herbal antidandruff shampoo using Costus speciosus extract.

Antidandruff Shampoo

Antidandruff shampoos are cosmetic and therapeutic preparations intended to cleanse the scalp while controlling dandruff-causing microorganisms and reducing scalp irritation.[5]

Types of Antidandruff Shampoo

1. Herbal Antidandruff Shampoo
2. Medicated Antidandruff Shampoo
3. Cosmetic Antidandruff Shampoo
4. Antifungal Shampoo
5. Conditioning Antidandruff Shampoo
6. Combination Therapy Shampoo[5]

Advantages

1. Effective removal of dandruff flakes.
2. Controls fungal growth on scalp.
3. Reduces itching and irritation.
4. Improves scalp hygiene.
5. Herbal shampoos have fewer side effects.
6. Enhances hair appearance and manageability.[6]

Disadvantages
1. Frequent application may be required.
2. Some formulations may cause dryness.
3. Possibility of allergic reactions.
4. Reduced efficacy in severe scalp disorders.
5. Stability issues with herbal extracts.[6]

Uses of Antidandruff Shampoo
1. Cleanses the scalp and hair by removing dirt, excess sebum, and impurities.
2. Helps control dandruff and scalp flaking.
3. Maintains scalp hygiene and freshness.
4. Reduces scalp itching and discomfort associated with dandruff.
5. Improves the appearance and manageability of hair.
6. Provides conditioning and moisturizing effects to the hair.
7. Supports scalp health through regular cleansing.
8. Helps maintain a healthy scalp environment and reduces recurrence of dandruff.[6]

Formulation

Table 1: Composition of Antidandruff Shampoo (100 mL).

Sr.No	Ingredients	Quantity	Role of Ingredients
1.	Costus speciosus Extract	5 g	Active herbal ingredient; possesses antifungal, antimicrobial, and antidandruff properties.
2.	Sodium Lauryl Sulfate (SLS)	20 mL	Primary surfactant; provides cleansing action and foam formation.
3.	Cocamidopropyl Betaine	10 mL	Secondary surfactant and foam booster; improves mildness and reduces irritation caused by SLS.
4.	Glycerin	5 mL	Humectant and moisturizing agent; prevents scalp dryness and maintains moisture.
5.	Methyl Paraben	7.2 g	Preservative; prevents microbial growth and increases shelf life.
6.	Citric Acid	q.s.	pH adjuster; maintains shampoo pH within the scalp-friendly range (5.5–6.5).
7.	Perfume	q.s.	Provides pleasant fragrance and improves consumer acceptability.
8.	Purified Water	Up to 100 mL	Vehicle/solvent; dissolves ingredients and forms the base of the shampoo formulation.

Method of Preparation
1. Costus speciosus extract was prepared and filtered.[7]
2. Sodium lauryl sulfate was dissolved in purified water with gentle stirring.
3. Cocamidopropyl betaine was added slowly to obtain a uniform surfactant mixture.
4. Glycerin was incorporated as a moisturizing agent.
5. Preservatives were dissolved separately and added to the formulation.
6. Costus speciosus extract was incorporated gradually with continuous stirring.
7. Citric acid was used to adjust the pH to 5.5–6.5.
8. Perfume was added and the final volume was adjusted with purified water.[7]

Evaluation of Antidandruff Shampoo

1. Physical Appearance

The formulation was evaluated for color, clarity, odor, and homogeneity by visual inspection.[8]

2. pH Determination

The pH was measured using a calibrated digital pH meter at room temperature.[8]

3. Viscosity

Viscosity was determined using a Brookfield viscometer at specified spindle speed.[8]

4. Foamability and Foam Stability

A known quantity of shampoo was shaken with water and foam volume was measured immediately and after standing for 5 minutes.[9]

5. Dirt Dispersion Test

One drop of India ink was added to diluted shampoo solution and the extent of dirt dispersion in foam was observed.[9]

6. Surface Tension

Surface tension was determined using a stalagmometer method.[9]

7. Wetting Time

The wetting ability was evaluated by measuring the time required for a canvas disc to sink in shampoo solution.[10]

8. Stability Study

The formulation was stored at room temperature and accelerated conditions for three months and observed periodically for changes in color, odor, pH, and viscosity.[10]

RESULT AND DISCUSSION

The herbal antidandruff shampoo containing Costus speciosus extract was successfully formulated and evaluated for various physicochemical parameters. The

formulation exhibited acceptable appearance, viscosity, foamability, cleansing action, and stability.

Sr.No	Parameter	Result
1.	Appearance	Light brown, clear and homogeneous
2.	Odor	Pleasant characteristic odorz
3.	pH	5.9 ± 0.1
4.	Viscosity	1450 ± 20 cP
5.	Foam Volume	145 ± 5 mL
6.	Foam Stability	Stable for 5 min
7.	Dirt Dispersion Test	Good
8.	Surface Tension	34.8 dynes/cm
9.	Wetting Time	18 ± 2 sec
10.	Skin Irritation Test	No irritation observed
11.	Stability Study	Stable for 3 months

CONCLUSION

The formulated antidandruff shampoo containing Costus speciosus extract exhibited acceptable physicochemical properties including suitable pH, foamability, viscosity, and stability. The herbal extract may contribute to antidandruff activity through its antifungal and anti-inflammatory properties. The formulation has potential as a safe and effective herbal antidandruff shampoo. Further antifungal and clinical studies are required to confirm its efficacy.

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