A Review of the Formulation and Evaluation of Polyherbal Antifungal Shampoo

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Abstract:

The present study involves the formulation and evaluation of a polyherbal antifungal shampoo using natural plant-based ingredient known for their antimicrobial and hair-care properties. Herbal extracts such as Neem (Azadirachta indica), Tulsi (Ocimum sanctum), Reetha (Sapindus mukorossi), Shikakai (Acacia concinna), Amla (Emblica officinalis), Aloe vera were incorporated to provide cleansing, conditioning, and antifungal effects[2]. The aim of the formulation was to develop a safe, effective, and eco-friendly alternative to synthetic antifungal shampoos. The prepared shampoo was evaluated for various physicochemical parameters including ph, foam height, viscosity, antifungal activity[3]. The result indicated that the polyherbal shampoo exhibited acceptable physicochemical properties and showed significant antifungal activity against common fungal pathogens responsible for dandruff and scalp infection. The study concludes that the polyherbal antifungal shampoo is a promising herbal formulation that can be used as a natural, safe, and effective therapeutic hair-care product[2].

Key Words:

Neem (Azadirachta indica), Tulsi (Ocimum sanctum), Reetha (sapindus mukorossi), Shikakai(Acacia concinna), Amla (Emblica officinalis).

1.Introduction:

Human beauty is fundamentally based on hair. Hair is one of the vital parts of the body, arising from the ectoderm of the skin[2]. Healthy hair can create a sense of self-confidence. Hair is an important part of the overall attractiveness of the human body[3]. Hair helps regulate body temperature by protecting from the sun and cold. Hair cleansing has been given little emphasis. Now, washing hair with shampoo has become common and is practiced all over the world[12]. Today, shampoos are widely used, which are based on herbal ingredients. Shampoos are a viscous mixture of surfactants (surfaceactive agent) used for cleansing. Shampoo is probably the most commonly used cosmetic item used in our daily lives to cleanse both the hair and scalp[6]. The primary function of shampoos is to cleanse the hair of accumulated sebum, dust, scalp debris, etc., and to nourish the hair without stripping its natural oils. Shampoos are liquid, creamy, or gel-like preparation[2,3].

In addition to cleansing, shampoos make hair manageable, easy to comb, and convenient to use. Dandruff, the excessive removing dead skin cells from the scalp, is apparently caused by fungi called Malassezia restricta and M. globosa. Malassezia, formerly known as pityrosporum, is a yeast that causes skin and scalp infection (schuster, 1984)[12].

Today, a broad range of shampoo are available on the market, including synthetic, herbal, medicated, and non-medicated options[9]. Consumer preference for herbal shampoos is increasing. It is extremely difficult to formulate a pure herbal shampoo using only natural ingredients that would be milder and safer than synthetic ones[3]. Shampoos containing synthetic ingredients cause harmful adverse effects, such as scalp inflammation, hair loss, dryness, split ends, graying of hair, and scalp irritation. Synthetic shampoo are mainly known for their foaming and cleansing action. Herbal shampoo contain extracts of various natural plants, which have various properties like anti-dandruff, antimicrobial, etc. Herbal shampoo have gained wide damand nowadays[12].

2.Classification Of Shampoo:

A. Based on the appearance:

- Powder shampoo
- Liquid shampoo
- Gel shampoo
- Oil shampoo
- Dry shampoo

B. Based on their origin:

- Herbal shampoo
- Synthetic shampoo

C. **Based on their function**:

- Conditioning shampoo
- Anti dandruff shampoo
- Baby shampoo
- Clarifying shampoo

A. Based on the appearance:

- **Powder shampoo**

A powder shampoo is a hair product that can be used either as a dry shampoo to absorb oil or as a wet shampoo by mixing it with water to create a lather[2].

- **Liquid shampoo**

A liquid shampoo is a viscous liquid hair care product, the most traditional form, used to clean hair and scalp by removing oil, dirt, and residues[2].

- **Gel shampoo**

Gel shampoo is used to treat scaly, itchy skin conditions affecting the scalp, such as psoriasis, seborrheic dermatitis, or dandruff. Inactive ingredient: water, sodium laureth sulfate, polysorbate 20, cocamidapropylbetaine, DMDM, hydantoin tetrasodium EDTA, PEG-200 methyl glucose dioleate, cocamide MEA, citric acid, sodium chloride, and triethanolamine[12].

- **Oil shampoo**

An oil shampoo is a hair product that uses natural oils to cleanse, nourish, and moisturize the hair and scalp. Unlike traditional shampoo with harsh sulfates, oil-based shampoos are designed to gently cleanse while leaving hair soft and shiny. They can also be formulated to control excess oil, or to provide deep hydration for dry or damaged hair, depending on the specific ingredients used[2,3].

- **Dry shampoo**

A dry shampoo is a waterless hair product, typically a powder in an aerosol can, that absorbs excess oil and dirt from the hair and scalp to make it look and feel cleaner without a traditional wash[12].

B. Based on the origin:

➢ **Herbal shampoo**

Herbal shampoo is a hair cleansing product made from natural, plant-based ingredient like botanical extracts and essential oils, as opposed to conventional shampoo that often contain harsh synthetic chemical. These natural components are used for their therapeutic properties to cleanse the hair and scalp, treat issues like dandruff, and promote overall hair health without causing damage or irritation[3].

➢ **Synthetic shampoo**

A synthetic shampoo is a commercial hair cleansing product made with artificial chemical, such as detergents, foaming agents, and preservatives, instead of natural ingredients. These product are designed to clean hair by using surfactants to bind and wash away oil and dirt. They are a contrast to herbal shampoo, which are made from natural plant-based ingredients[2].

C. **Based on their function**:

➢ **Conditioning shampoo**

A conditioning shampoo retains all the features of a normal shampoo, which are to clean the hair by removing dust, dirt, and pollutants but also has other ingredients of a conditioner that help to make hair softer and more manageable than one finds after using a normal shampoo[12].

➢ **Anti-dandruff shampoo**

An antifungal shampoo is a used to treat fungal infection of the scalp, such as dandruff and seborrheic dermatitis. That work by killing fungus or inhibiting its growth. They provide relief from symptoms like itching and flaking and help restore a healthy scalp environment[3].

➢ **Baby shampoo**

Baby shampoo is a gentle, tear-free hair cleaning product specifically formulated for infants and young children with sensitive skin and eyes. It uses milder surfactants and often avoids harsh chemicals, artificial fragrances, and dyes to prevent irritation, while its moisturizing ingredients help maintain scalp health[3].

➢ **Clarifying shampoo**

Clarifying shampoo is a hair care product that deeply cleanses the hair. It is formulated with unique ingredients designed to remove impurities, oil, dirt, product buildup, and other residues from the scalp and hair shaft[12].

❖ **Ideal properties of poly-herbal shampoo**

- Dust or soil, too much sebum or other fatty substances, and loose corneal cells from the hair should all be fully and properly removed.
- It should generate a sufficient amount of foam to meet the user psychological needs.
- It should leave the hair at the very least non-dry, soft, and shiny with good manageability. Fly off.

❖ **Advantages of poly-herbal shampoo**

- Cleansing properties, improving hair hygiene.
- Gentle on scalp and suitable for long-term use.
- Herbal ingredients reduce the chances of itching, irritation, redness or hair damage.
- Herbal ingredients are biodegradable.
- Less environmental toxic load compared to fully synthetic shampoo.

- Many herbal ingredients are easily available and inexpensive.
- People nowadays prefer natural and herbal products, so polyherbal shampoo have high market demand.

❖ **Function of poly shampoo**

- Removes dirt, excess oil, dust, sweat, and pollutants from hair and scalp.
- Reduce fungal infection (like dandruff, Malassezia)
- Prevent bacterial scalp infection.
- Prevents scalp dryness and maintains natural moisture.
- Cleans scalp pores and promotes healthy hair growth.
- Improves hair texture.

3.Plant Profile:

Reetha

- Biological name – Sapindus mukorossi
- Common name – Reeta, Soapnut, Indian Soapberry
- Synonyms – Sapindus oocarpus Radlk
- Kingdom – Plantae
- Family – Sapindaceae
- Genus – Sapindus
- Species – S. mukorossi
- Order – Sapindales
- Properties – Natural Cleanser / Surfactant

Fig. 1. Reetha

Shikakai

- Biological name – Acacia concinna
- Common name – Shikakai
- Synonyms – Acacia rugata, Acacia sinuata

- Kingdom – Plantae
- Family – Fabaceae (Leguminosae)
- Genus – Acacia
- Species – Acacia concinna
- Properties – Hair cleanser / conditioner

Fig. 2. Shikakai

Amla

- Biological name – Phyllanthus emblica
- Common name – Indian gooseberry
- Synonyms – Emblica officinalis, Dhatri / Dhatriphala
- Kingdom – Plantae
- Family – Phyllanthaceae
- Genus – Phyllanthus
- Species – Phyllanthus emblica

Fig. 3. Amla

Neem

- Biological name – Azadirachta indica
- Common name – Neem, Nimba, margosa tree
- Synonyms – malia azadirachta
- Kingdom – Plantae
- Family – Meliaceae
- Genus – Azadirachta
- Species – Azadirachta indica

Fig.4. Neem

Tulsi

- Biological name – Ocimum tenuiflorum (Ocimum sanctum)
- Common name – Tulsi, Holy Basil
- Synonyms – Tulasi, sacred basil
- Kingdom – Plantae
- Family – Lamiaceae
- Genus – Ocimum
- Species – Ocimum tenuiflorum

Fig.5. Tulsi

Aloe vera

- Biological name – Aloe vera (L.) Burm.f.
- Common name – Aloe vera, Ghritkumari, Aloe
- Synonyms – Aloe barbadensis miller, aloe indica royle
- Kingdom – Plantae
- Family – Asphodelaceae
- Genus – Aloe
- Species – Aloe vera

Fig.6. Aloe vera

4. Materials And Methods

Table 4.1:- Ingredients

s.no.	Ingredients	Quantity (50ml)	Properties
01	Reetha	5g	Natural cleanser / Surfactant
02	Shikakai	5g	Hair cleanser / Conditioner
03	Amla	5g	Antioxidant
04	Neem	5g	Antifungal / Antibacterial
05	Tulsi	2.5g	Antimicrobial
06	Aloe vera gel	2.5ml	Moisturizer and Conditioner
07	Sodium lauryl sulphate	5g	Foaming Agent
08	Citric Acid	0.1g	Ph Adjuster
09	Methyl Paraben	0.05g	Preservative
10	Distilled Water	Up to 50 ml	Solvent

5. Conclusion

The formulation and evaluation of poly-herbal shampoos is a complex process that involves several considerations, such as the selection of appropriate plant or herbal ingredients for the formulation, the extraction process, and the evaluation of the safety and efficacy of the final product. Using herbal ingredients or plant extracts in shampoo formulations offers several advantages, including improved hair health, reduced environmental impact, and decreased hair fall. However, testing and evaluation are crucial to ensure the safety and efficacy of the product. Overall, the development and evaluation of herbal shampoos is an important area of research that can provide consumers with a more natural and sustainable option for hair care.

This study aimed to develop a herbal shampoo that would reduce hair fall while promoting hair growth. Besides being safer than chemical conditioning agents, the shampoo formulation significantly reduced hair breakage during combing and promoted stronger hair growth. The shampoo's pH was adjusted to maintain the acidic environment of the scalp, and a physicochemical method was used to preserve the formulation, avoiding the risks associated with chemical preservatives. The poly-herbal shampoo is expected to be more effective and safer than synthetic shampoos and will likely be well-received by consumers. Several plant or herbal ingredients are used in the shampoo, such as neem leaves, reetha, shikakai, amla, aloe vera, and tulsi, which provide conditioning benefits.

6. Reference

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