

Development of Medicated Anti-Dandruff Scalp Cleanser and Hair Nourisher Self Stable Containing Phytoconstituent Poly-Herbal Shampoo

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ABSTRACT:

Dandruff is a common disorder affecting the scalp condition caused by yeast *Pityrosporum*. Hair care cosmetic are designed and development to keep hair feeling and looked beautiful and to maintain the scalp in healthy condition. Most of the formulation is currently present in the market for proposed various functions which provide the good hair health conditions. The aim of our current study is to provide a good quality cosmetic which should provide the best anti-dandruff, scalp cleansing, hair nourishing and shining properties in a single cosmetic product (Shampoo). This study intends to formulate and develop anti-dandruff scalp cleanser and hair nourisherself stable shampoo which should produce the multi-benefits for hair and scalp. In this formulation we should use Herbs like Neem, Lemon Zest, Orange Peel, Amla Fenugreek, Aloe-vera, Rice water, Tulsi etc. And chemicals like- Ethanol, Triethanolamine, Liquid Paraffin etc. The area where we should mostly focus in our research is to produce a self stable shampoo where we can't use any extra preservative chemicals. Evaluation of shampoos comprises the quality control tests including visual assessment and physiochemical controls such as pH, density and viscosity. Lauryl glucoside based detergents are the most common but the concentration will vary considerably from brand to brand and even within a manufacturer's product range. Cheap shampoos may contain a high detergent concentration while expensive shampoos may contain very little of a cheap detergent. The shampoo demonstrate effective cleansing, foam stability, and anti-fungal activity against without causing irritation. The result suggest it as a safe, natural alternative to synthetic shampoo for dandruff treatment.

Keywords: Poly-herbal Shampoo, *Pityrosporum*, Self stable shampoo etc.

I. INTRODCTION:

A shampoo may be described as a surfactant preparation (i.e. surface-active material) in an acceptable form-liquid, solid, or powder which, when used under the specified conditions, removes surface grease, dirt and skin debris from the hair, shaft, and scalp without adversely affecting the hair, scalp, or user's health. The word shampoo used in English dates back to 1762, meaning to "massage". The word derived from Anglo-Indian shampoo to smear, knead the muscles, massage in turn from Hindi shampoo imerative of champna. Shampoo assessment involves quality control measures including visual examination, and physiochemical controls such as pH, density, and viscosity. Sodium lauryl sulfate-based detergents are the most common but the concentration can vary widely from brand to brand and also within the product range of a supplier.

Ideal properties of herbal shampoo:

1. It should not irritate the eyes or skin after application.
2. It should be stable throughout the usage.
3. It should produce enough foam.
4. It should be easy to apply and remove after rising with water.
5. It should completely remove dust or fatty substances on application.
6. It should leave hair soft, lustrous, and non-dry with good manageability to satisfy consumer's needs.

BENIFITS OF HEARBAL SHAMPOO

1. More Shine
2. Less Hair Loss
3. Long Lasting Colour
4. Stronger and More Fortified Hairs
5. All Natural, No Chemicals
6. Wont Irritate Skin or Scalp
7. Keep Healthy Natural Oils

It is hair care beautifying viscous product which is used to clean up the scalp and hair.

Shampoo is a separated product applying to wet hair, roots and scalp, then rinsing it out. India: The word "shampoo" is derived from the Hindi word "chāmpo," which means "to press or massage" In ancient India, people used a shampoo and oils to clean their hair. Egypt: In ancient Egypt, people used a mixture of a natural mineral salt to clean their hair. Greece and Rome: In ancient Greece and Rome, people used olive oil to clean their hair. People in Europe used a mixture of soap, water, and herbs to clean their hair.

Hair is a protein fibre that grows from follicles present in the dermis. Interest in hair primarily focuses on hair growth, hair type, and hair care, but hair is also an important biological material composed primarily of proteins, including alpha keratin. Various forms of hair, such as hairstyles and hair removal methods, vary widely across cultures and historical periods, but they are often used to indicate personal beliefs, social status, such as their age, gender or religion. Human hair is often classified into three common human ethnic groups, which are African, Asian, and European. Based on different aspects and perspectives, several studies on human hair have been carried out in many scientific fields, including biology, dermatology, cosmetics, forensics, and medicine.

Dandruff is the biggest problem in the world today. It is apparently caused by fungi called *Malassezia* and *M.globose*. This is a common disease caused by the *pittosporum* yeast that affects the condition of the scalp. Dandruff cannot be completely removed; it can only be effectively controlled. The scalp sheds dead cells almost invisible, but in some cases, they slough off as visible flakes called dandruff. Anti-dandruff agents are intended to reduce dandruff. Although the causes of dandruff are not completely understood, treatment involves the use of several active ingredients that act as antibacterial agents or antimetabolic agents.

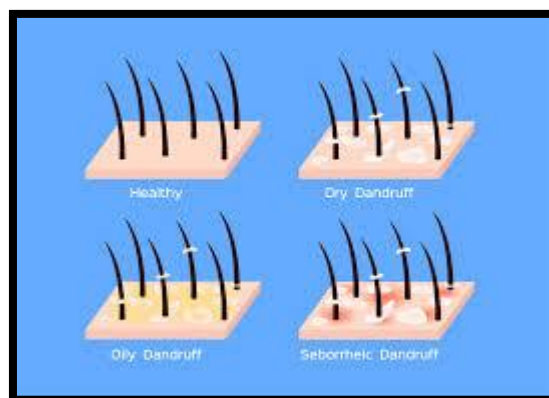


Figure 1: Healthy to dandruff hair

Hair Anatomy

The human hair is composed of three main parts: the hair shaft, the hair bulb, and the hair follicle. The hair shaft is the visible part of the hair that extends from the scalp to the tip of the hair. The hair bulb is the base of the hair shaft and is located at the bottom of the hair follicle, which is a tubular structure that surrounds and supports the hair shaft. The sebaceous gland is a small gland that produces sebum, an oily substance that lubricates and protects the hair. For more info, you can read about the hair growth cycle.

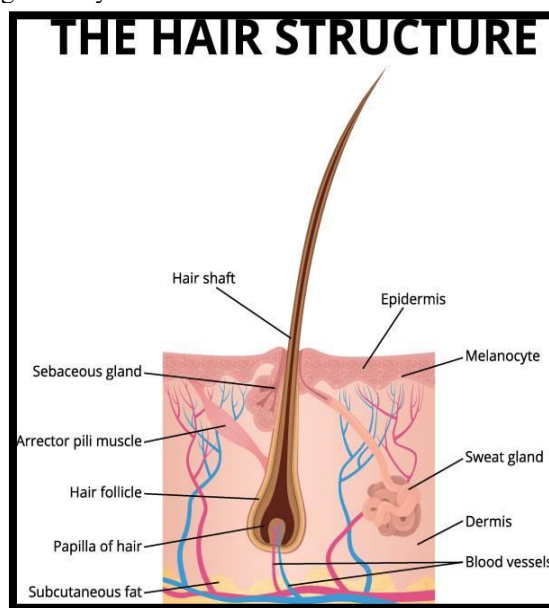


Figure 2- Hair Structure

HERBS:

Herbs are a widely distributed and widespread group of plants, excluding vegetables, with savory or aromatic properties that are used for flavoring and garnishing food, for medicinal

purposes, or for fragrances. Culinary use typically distinguishes herbs from spices. *Herbs* generally refers to the leafy green or flowering parts of a plant (either fresh or dried), while *spices* are usually dried and produced from other parts of the plant, including seeds, bark, roots and fruits. Herbs have a variety of uses including culinary, medicinal, aromatic and in some cases, spiritual. General usage of the term "herb" differs between culinary herbs and medicinal herbs; in medicinal or spiritual use, any parts of the plant might be considered "herbs", including leaves, roots, flowers, seeds, root bark, inner bark (and cambium), resin and pericarp.-+



Figure 3 – Herbs

The word "herb" is pronounced in Commonwealth English, but is standard among American English speakers as well as those from regions where h-dropping occurs. In Canadian English, both pronunciations are common. In botany, the noun "herb" refers to a "plant that does not produce a woody stem", and the adjective "herbaceous" means "herb-like", referring to parts of the plant that are "green and soft in texture"

NEEM:

Azadirachta indica, commonly known as neem, margosa, nimtree or Indian lilac, is a tree in the mahogany family *Meliaceae*. It is one of the two species in the genus *Azadirachta*. It is native to the Indian subcontinent and to parts of Southeast Asia, but is naturalized and grown around the world in tropical and subtropical areas. Its fruits and seeds are the source of neem oil. *Nim* is a Hindustani noun derived from Sanskrit *nimba* (निंब).



Figure 4 - Neem

TULSI:

Ocimum tenuiflorum, commonly known as tulasi, tulsi, or holy basil, is an aromatic perennial plant in the family *Lamiaceae*. It is widely cultivated throughout the Southeast Asian tropics. It is native to tropical and subtropical regions of Asia, Australia and the western Pacific. This plant has escaped from cultivation and has naturalized in many tropical regions of the Americas. It is an agricultural and environmental weed



Figure 5: Tulsi

LEMON ZEST :

Zest is a food ingredient that is prepared by scraping or cutting from the rind of unwaxed citrus fruits such as lemon, orange, citron, and lime. Zest is used to add flavor to many different types of food. In terms of fruit anatomy, the zest is obtained from the flavedo (exocarp) which is also called zest. The flavedo and white pith (albedo) of a citrus fruit together makes up its peel. The amounts of

both flavedo and pith are variable among citrus fruits, and may be adjusted by the manner in which they are prepared. Citrus peel may commonly be used fresh, dried, candied, or pickled in salt.



Figure 6 : Lemon Zest

ALOE VERA :

Aloe vera (*Aloe barbadensis Miller*) is a perennial succulent, cactus-like plant known for its thick, greenish, spiky leaves that store water and a soothing, clear gel. It is widely used in alternative medicine for its moisturizing and healing properties, containing vitamins, minerals, and enzymes that

provide anti-inflammatory and antioxidant benefits. The *Aloe vera* plant is a short-stemmed perennial herb that grows in arid and tropical climates, characterized by its grey-green leaves arranged in a rosette pattern. The leaves have serrated margins with small spines and contain two primary substances.



Figure:7 Aloe vera

II. METHOD AND MATERIALS :

Materials:

Table.Ingredient table

	HERBS	FUNCTION
1.	Neem	Anti-fungal
2.	Tulsi	Anti-septic
3.	Aloe vera	Moisturizer, hair strengthen
4.	Lemon zest	Anti-dandruff, scalp cleanser
5.	Curry Leaves	Reduce hair fall, strengthen follicles.
6.	Amla	Nourishing hair by roots, promoting growth
7.	Hibiscus	Stimulating follicles, promoting growth
8.	Ginger	Stimulate scalp circulation, reduce hair brakage
9.	Fenugreek	Promote hair growth and reduce hair fall
10.	Glycerine	Humectant
11.	Laurel glucoside	Foam inducer
12.	Tea Leave Oil	Anti-dandruff, anti-bacterial
13.	Ethanol	Solvent, preservative
14.	Polyethylene glycol(PEG)	Hair thickener
15.	Camphor	Reduce dandruff, promote blood circulation
16.	Vanila, Orange	Fragrance
17.	De-ionized water	Vehicle



Figure 8: Ingredients

PROCEDURE:

First clean all the glassware and equipment used in this formulation.



Collect all the herbs and extract it all using proper pharmacopoeia procedure.



Mostly using Clevenger/ Soxhlet apparatus.



Figure 9: Extraction procedure



Mostly ethanol and water is used as solvent for extraction.



Collect the residue of extraction and further start the manufacturing process of shampoo.



Add laurel glucoside using water or vehicle on it.



Lastly add the fragrance on it.



Store it on a suitable container on suitable temperature.



Figure 11: Preparing Shampoo

EVALUATION TEST OF FORMULATION:

1)Physical appearance/visual inspection: The formulation was assessed for clarity, color, texture, and odor.

2) Determination of PH: One strip of pH paper was dipped in a 10% shampoo solution in distilled water at room temperature (25 degrees Celsius), and the color of the strip was compared to the key. After calibration, the pH meter can also be used. A basic solution causes the cuticle (outer layer) of the hair to swell and open, while an acidic solution causes it to shrink and lay flat on the hair shaft. The majority of shampoos are either natural or mildly acidic.

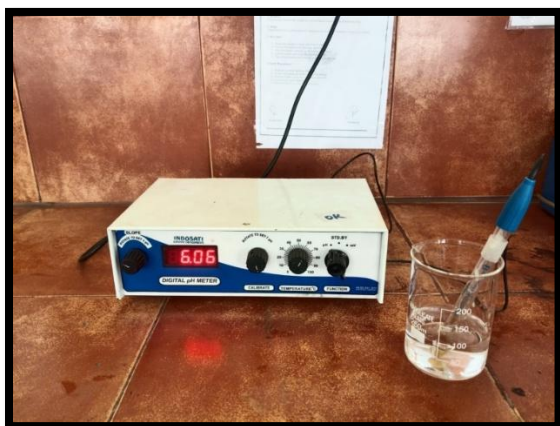


Figure 12: Ph test of shampoo

3)Dirt Dispersion: A large test tube containing 10 ml of distilled water was filled with two drops of shampoo and one drop of India ink. The test tube was then sealed and shaken ten times. it was judged that there was none, mild, moderate, or heavy ink in the foam. Shampoo that concentrates the ink in the foam is regarded as being of low quality. the debris has to leave in the liquid portion dirt that remain in the foam was hard to wash out it will deposit on the hair.



Figure 13: Dirt dispersion test

4)determination of solid content percentage: 4 grams of shampoo are added to a dry, clean evaporating dish after it has been weighed. Weighing the shampoo and dish together. - The correct amount of the shampoo was measure only and put the evaporating dish with shampoo was put on the hot plate until be aqueous portion was evaporated the amount of the shampoo only (solid) is drying determined - If a shampoo has too many solids it was tough to work into the hair or tootough to wash out - If it does not have sufficient, it was be too liquid and wash away quickly. A good shampoo will be approximately 20% to 30% solids.

5)foam stability test: The cylinder shake method was used extensively to assess foaming capacity. Fill a 250 ml graduating cylinder with 25 ml of 1% shampoo solution, cover it with your palm, and shake it for ten minutes. Following a minute of shaking, the total amount of the foam contents was recorded. The volume of foam was measured right away after shaking, and it was recorded for four minutes at one-minute intervals.



Figure 14: Foam stability test

6) Skin Irritation Test: Prepared antidandruff shampoo was applied on skin for 5 minutes after washed and test for irritation or inflammation on the skin.



Figure 15: Skin irritation test

7) Antifungal activity & In-vitro anti-dandruff activity: The anti-dandruff properties of three anti-dandruff shampoo formulations were evaluated using the diffusion assay method. The agar well diffusion method was used to test against *Malassezia furfur*. Using a sterilized stainless-steel corn borer, wells were created after the microbial cell solution was spread out onto the Sabouraud Dextrose Agar (SDA) plates. For 48 hours, the plates are incubated at 35 ± 2 °C. Plates are checked for the zone of inhibition surrounding the wells after the allotted amount of time. The ruler method was used to manually measure the inhibitory zones diameter.

8) Surface tension: Measurement was carried out with a 10% of shampoo dilution in distilled water at room temperature thoroughly clean the stalagmometer using chromic acid and purified water because surface tension is highly affected with grease or other lubricants.

9) Stability studies: The stability studies for the antidandruff formulations were performed according to ICH guidelines. The formulations were tested for their physical appearance, %solid content, transparency, and PH

III. RESULTS AND DISCUSSION:

The prepared Antidandruff shampoo was evaluated for physical appearance/visual inspection, determination of pH, determine % of solid contents, surface tension measurement, foam ability and antimicrobial activity. The synthesized anti-dandruff herbal hair formulation is loaded with the goodness of natural herbs along with the active phyto-constituents. It nourishes hair mildly by acting as an anti-dandruff agent. It effectively removes excess oil from the scalp, which is the major root cause behind dandruff.



Figure 15: Prepared Shampoo

The formulation is made with dried herbal ingredients, signifying few chances of the decomposition of the formulation, as there is a humid substance in either raw or finished form. The formulation was kept under observation for one month at room temperature to look for any visible changes in its color, odor, texture and appearance. The pH was also noticed. The formulation can be stored easily and is suitable to be used at any temperature, at any place in its stable form, since it is a natural herbal based formulation, with no harmful chemicals. However, the frequent use of it provides voluminous, smooth and dandruff free hair.

IV. CONCLUSION:

The formulated herbal anti-dandruff shampoo offers a promising solution to the persistent issue of dandruff, leveraging the power of

natural ingredients to provide effective relief. Through meticulous research and development, this shampoo combines a blend of botanical extracts known for their anti-fungal and anti-inflammatory properties, targeting the root cause of dandruff while soothing the scalp. Its gentle yet potent formula not only eliminates existing flakes but also prevents their recurrence, promoting a healthier scalp environment. The formulated herbal anti-dandruff shampoo stands as a testament to the effectiveness of herbal remedies in combating common scalp issues.

In the present research antidandruff shampoo was prepared and for evaluation compared to standard drug against *Staphylococcus aureus* and zone of inhibition obtained. The formulation was also evaluated for the physicochemical properties using recommended procedures. The shampoo revealed ideal characteristics of a shampoo. It may have effectiveness in antidandruff activity efficiency. Therefore the formulation met the aims of the present research, which could hold promise for further studies. A comprehensive series of tests was conducted to evaluate the performance of the formulated shampoo. These assessments focused on various attributes, including foaming ability, viscosity, pH level, and conditioning performance

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