



Formulation And Evaluation Of Antidandruff Herbal Shampoo

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Abstract: The aim of the present study is to formulate and evaluate herbal Anti dandruff shampoo containing natural ingredients with an emphasis on safety and efficacy. It clears dirt, dandruff, promotes hair growth, luster, strengthens and darkens the hair. The shampoo sector is probably the largest unit of among the hair care products. Since the shampoos are one of the cosmetic product used in daily as the hair is special and cherished feature of humans. Majority of ingredients in the shampoos are chemicals and hence have been under severe attack due to its potential risk of side effects with its usage. The main objective is to study how to eliminate harmful synthetic ingredients from anti-dandruff shampoo formulation and substitute them with safe natural ingredients. An attempt has been made to combine modern formulation technology into a formula based on natural ingredients. The shampoo was prepared by taking the extracts of Orange peel powder (*Citrus Aurantium Dulcis-Rutaceae*) (active ingredient). Curry Leaves (*Murraya Koenigii-Rutaceae*), Ginger (*Zingiber Officinale- Zingiberaceae*), Aloe vera (*Aloe Barbados's Miller-Asphodelaceae*), Reetha (*Sapindus Mukorossi-Sapindaceae*) in different proportions. Several physicochemical tests were performed for visual assessment, wetting time, pH, assurance of solid contents, surface tension, detergency, dirt dispersion, conditioning performance, foam stability. The formulated herbal shampoo is black in color with demonstrable good froth stability, detergency, good cleansing, low surface tension, optimum pH and conditioning activity. All these are the ideal characters for good quality of the herbal shampoo to be used in daily life. However, further scientific investigation is required for validation of its overall quality.

KEYWORDS: pH, Herbal shampoo, Natural ingredients, Hair, Dandruff, Cleansing action, Dirt removal

INTRODUCTION

HAIRS ARE THE INTEGRAL PART OF HUMAN BEAUTY.

Hair is a protein filament that grows from follicles on the dermis or skin. Scientific name of hair is pili or pilus.

Hair is a component of the integumentary system and extends downward into the dermal layer where it sits in the hair follicle.

The presence of hair is a primary differentiator of mammals as a unique class of organisms. In humans, it is a cherished and highly visible indicator of health, youth, and even class.

It has a sensory function, protects from cold and UV radiation, and can have a significant psychological impact when its growth or structure is deranged.

At a microscopic level, the variety in length, color, diameter, and cross-sectional shape of each hair creates the characteristic profiles seen across ethnic groups and among individuals.

Hair Anatomy

► Hair grows from hair follicles situated within the fatty layer of the scalp. Contrary to the popular belief that hair grows as single strands, hair follicles actually grow in groups of 1-4 hairs called "follicular units"

At the base of each hair follicle is a hair bulb where the growth mechanism for producing hair occurs. Hair follicles get their nourishment from the blood vessels within the dermis. The cells divide and develop to produce the hair shaft.

While the hair is still developing underneath the epidermis, it maintains a soft form. Once it pushes past the epidermis,

Parts of the Hair:

■ Dermal papillae:

The dermal papilla is responsible for regulating the hair cycle and hair growth, and is also comprised of androgen receptors that are sensitive to the presence of DHT.

Matrix:

The matrix surrounds the dermal papillae and contains all the active cells needed for hair growth and for the development of the different parts of the hair.

Outer root sheath:

The outer root sheath, or tricholemma, is the outermost part of the hair and is keratinized.

Inner root sheath:

Inner root sheath is comprised of three parts: the Henley layer, Huxley layer, and cuticle. The Henley's and Huxley's layers are capsular layers that anchor onto each other

PROBLEMS RELATED TO HAIR:

- Dandruff
- Dry hair
- Split ends
- Oily hair
- Frizzy hair
- Limp hair
- Hair loss
- Heat damage
- Color damage
- Grey hair

ADVANTAGES OF SHAMPOO:

Cleansing properties

Improving hair hygiene.

Treating scalp conditions Treatment for dry scalp

Treatment for hair loss.

Treatment for greasing or oily hair.

Relieves itch and irritation

Repairs damaged hair.

Shampoo keeps hair silky or smooth.

IDEAL PROPERTIES OF SHAMPOO:

To make the hair smooth and shiny.

Produce good amount of foam

Should not cause irritation to scalp skin and eye.

Should completely.effectively remove dirt.

Impart pleasant fragrance to hair.

Good biodegradability

HERBAL SHAMPOO:

They are the cosmetic preparations that with the use of traditional ayurvedic herbs are meant for cleansing the hair and scalp just like the regular shampoo. They are used for removal of oils, dandruff, dirt, environmental pollution, etc.

ADVANTAGES OF HERBAL SHAMPOO:

Herbal shampoo are made out of pure and organic ingredients and there are no synthetic additives or surfactants are free of any side effects.

Are bio-degradable and earth friendly. It doesn't cause irritation to the eyes.

It is cost friendly, not much expensive

Regular usage of herbal shampoo can do wonders for your hair.

By using herbal shampoo, you can get the perfect oil balance.

They are made out of natural essential antiseptic properties that prevent our hair and scalp from the harsh u.v rays of the sun thus preventing skin infections

FUNCTIONS OF INGREDIENTS:

1) Orange peel: Citrus Aurantium Dulcis, Rutaceae. It is good for itchy scalp and removes dandruff as it loaded with antibacterial agents and a high content of essential compounds like vitamin C. It will give you a nice and refreshing feel by adding good smell to your crowning glory.



2) Reetha : Sapindus Mukorossi-Sapindaceae, Reetha or Soapnuts is also called as Arishtak in Ayurveda and "Soap nut tree" in India. It is well known for its traditional medicinal uses and is commonly used as a hair cleanser. It is an anti hair loss shampoo, the natural antifungal and anti bacterial which may helps in anti dandruff. It can be used on a daily basis to provide nourishment to the hair scalp and promote hair regrowth.



3) Hibiscus: Hibiscus rosa-sinensis, malvaceae, The Hibiscus nourishes the hair follicles, soften the hair and make it more manageable. To reap the nourishing benefits of Hibiscus for your hair, you can use conditioners that have Hibiscus as the key ingredient. flowers

4) Ginger :

Zingiber Officinale-Zingiberaceae, the anti septic properties of ginger helps in treating dandruff effectively by getting rid of infections and fungus on the scalp. One of the main reason for dandruff is imbalance in PH. Ginger balances the PH of the scalp that ultimately helps in hair growth



5)Curry leaves:

Murraya Koenigii-Rutaceae, Curry leaves help to control dandruff. Its antifungal properties help in reducing dandruff and itchiness leaving you with a clean scalp and healthy hair. Curry leaves moisturize your scalp, promote hair growth, and prevents dandruff. Curry leaves are rich in cell reinforcements that saturate the scalp while disposing the dead hair follicle, helps in preventing hair fall, premature hair graying, and dandruff



6)Aloe vera :

Aloe Barbadensis Miller-Asphodelaceae, Aloe vera may also reduce inflammation, which can help people with dandruff symptoms, such as itchiness. It is an antifungal and antibacterial properties of Aloe vera may prevent dandruff. It will restore the PH of scalp and increases the hair Growth.



Function of other chemicals:

- 1) Glycerine: It helps in moisturizing of hair.
- 2) Sodium Chloride: It is used as a thickener.
- 3) Sodium lauryl sulphate (SLS): It is used as a surfactant.
- 4)Lemon juice: It is used as a preservative.
- 5) Gum (acacia): It is used to increase viscosity.
- 6) Castor oil: It helps for seal out moisture, reduce breakage, and protect the hair from damage.

FORMULATION OF HERBAL SHAMPOO:

Formulation of the herbal shampoo was done as per the formula given in Table 1. To increase the thickness of formulation, SLS (7.5%) solution was prepared using 0.1 M NaCl. Twenty ml of the herbal extract was added to 20 ml SLS solution with 20 ml NaCl solution and mixed by shaking gently. The final volume was made to 100 ml by adding 10 ml acacia gum extract, 2 ml of glycerine and 25 ml of water. To improve aroma in the formulation, sufficient quantity (q.s.) of essential oil (castor oil) was added. The shampoo also included one capsule of Vitamin E for conditioning, activated charcoal for color and 2 ml of lemon juice as preservative

Composition of herbal shampoo

Ingredients	Quantity
Herbal extracts	20 ml
Sls	20 ml
O.1 M Nacl	20 ml
Acacia(gum)	10 ml
Glycerine	2 ml
Vitamin E capsule	2
Lemon juice	2 ml
Essential oil (castor oil)	q.s
Water	25

Materials and methods Collection of plants:

The parts of plants like orange (peel), Reetha (fruit), Ginger (root) and Guar gum were collected from the local market. Curry patta (leaves) and Aloe vera (leaves) were obtained from nursery locally. These were washed under running water to remove contaminants. They are dried in sunlight, converted into coarse powders and sieved using 60meshes. The extracts were prepared by decoction method and the prepared extracts were stored in well-closed containers.

Preparation of herbal extract:

5g of Curry patta powder, 5g of Ginger water, 10g of Aloe vera gel, 20g of Reetha and 5g of orange peel powder (Table 2) were mixed with 100 ml water in a stainless steel vessel. The mixture was kept for boiling until the water

Ingredients of herbal extracts

Plant	Part	Quantity for 100 mg
Curry leaves	Leaves	5 gm
Ginger	Root	5 gm
Orange peel powder	Peel	20 gm
Retha	Fruit	10 gm
Hibiscus	Leaves	5 gm
Aloe vera	Leaves	10 gm

EVALUATION OF HERBAL SHAMPOO:

To evaluate the prepared formulations, quality control tests including visual assessment and physicochemical controls such as pH, density, viscosity, surface tension, foam volume, foam stability and wetting time were performed using standard protocols.

► Physical appearance/visual inspection:

The formulation prepared was evaluated for the clarity, color, odor and foam producing ability and fluidity [14].

► Determination of pH:

A 10% v/v shampoo solution was constituted in distilled water and the pH of the solution was measured by using a calibrated pH meter [15].

► Determination of solid content percentage:

A clean dry evaporating dish was weighed and 4 grams of shampoo was added to the evaporating dish. The evaporating dish with shampoo was placed on the hot plate until the liquid portion was evaporated. The weight of the solid contents present in the shampoo was calculated after drying.

► Wetting time:

Wetting time was calculated by noting the time required by the canvas paper to sink completely [16]. A canvas paper weighing 0.44 g was cut into a disc of diameter measuring 1-inch. Over the shampoo (1% v/v) surface, the canvas paper disc was kept and the time taken for the paper to sink was measured using the stopwatch

► Dirt dispersion:

Two drops of herbal shampoo were added in a wide mouthed falcon tube containing 10ml of distilled water. 1 drop of India ink was added, the falcon tube was covered and shaken for ten times. The amount of ink in the foam was estimated as None, Light, Moderate, or Heavy.

► Cleansing action:

The cleansing property of the herbal shampoo was evaluated by the application of the shampoo on hair that has not been washed for seven days. The shampoo was used to wash the hair of human subject that had applied oil 4-5 hours before washing. The performance of the shampoo was assessed on its ability to remove oily dirt from scalp.

► Foaming ability & foam stability:

Cylinder shake method was used for determining foaming ability. 50ml of the 1% herbal shampoo solution was put into a 250ml graduated cylinder & the cylinder was covered with hands and shaken for 10 minutes. The total volume of the foam content after 1 minute shaking was recorded. Immediately after shaking the volume of foam at 1 minute intervals for 10 minutes were recorded. The foam volume remains same throughout the period of about 5 min showing that the generated foam by the shampoo has good stability and the prepared shampoo exhibits higher foam property which may be due to the presence of soapnut.

► Stability Study:

The stability of the formulation was studied for a period of four weeks by keeping at temperature of 25 - 30 deg * C

► Skin Irritation Test:

Prepared herbal shampoo was applied on skin for 5 minutes after that was washed and tested for irritation or inflammation to the skin.

► Conditioning attributes:

The conditioning effect of the shampoo on the hair was evaluated after the hair had been washed with it. Conditioning properties include all desirable benefits imparted to the hair such as increased mass to the hair, improved lustre, softness and silkiness.

Conclusion :

The objective of the study was to develop a stable and functionally effective herbal shampoo by excluding synthetic chemicals, which are normally incorporated in such formulations to larger extent. Synthetic hair shampoo is known to damage the hair cuticle leaving it brittle, dull and dry. Although the formulated shampoo contains synthetic chemical as SLS (7.5%) but its percentage is too small as compared to synthetic shampoo (10-40%) available in the market. The evaluation study on our shampoo showed good cleaning action, better foaming capacity, and quick wetting time. We have used Aloe-vera gel to provide the conditioning effects.

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