

Formulation and Evaluation of Sulfate Free Herbal Powder Shampoo

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Abstract: Shampoos are kind of detailing that are utilized for hair and body washing or helpful purposes. Shampoos are anticipated to be much more than unimportant cleansing specialists. The discoveries of this examination uncover that manufactured additives have now and then been the cause of antagonistic impacts among shoppers, so it's the challenge to get ready a total home-grown cleanser in powder frame. This thinks about points to define a self-protecting cleanser powder containing common fixings with accentuation of security and adequacy, will maintain a strategic distance from the hazard postured by chemical fixings. The defined cleanser powders contain Amla natural product, Hibiscus Leaf, Neem leaf, Shikakai natural product, Henna Leaf, Ritha natural product. All cleanser powders were assessed for organoleptic, powder characteristics, Physicochemical assessment, soil scattering, frothing capacity, wetting time etc. As the chosen drugs being utilized since long time as single sedate or in combination, display examinations will assist aid set up a standard formulation and assessment parameters, which is able certainly offer assistance within the standardization for quality and immaculateness of such sort of home-grown powder shampoos. After totally thinking about it is concluded that all the three powder shampoos appeared great quality of cleanser. The PHS2 was found to be tasteful for the utilize among the three. While the definition is within the powdered shape so having more chance amid capacity as compared to fluid cleanser.

Keywords: shampoo, herbal powder and herbs, evaluation

I. INTRODUCTION

The essential component of human attractiveness is hair. Since ancient times, people have used herbs to manage, clean, and adorn their hair. Synthetic substances have risen in popularity throughout time, but people are now more conscious of their detrimental effects on skin, eyes, and hair. These factors drew the population to herbal products since they are less costly and have fewer negative effects. Shampoos and hair cleansers are used for more than just cleaning; they also give hair a glossy finish and keep it manageable and oily. There are many different kinds of shampoos, including powder, clear liquid, lotion shampoo, medicinal shampoo, liquid herbal shampoo, solid gel shampoo, and soon. Regarding the stability standards for herbal shampoos. Simple or basic shampoo, antimicrobial or antidandruff shampoo, and nutritious shampoo with vitamins, amino acids, and proteins hydrolyzed are all possible options, depending on the kind of constituents. Since the dawn of civilization, people have utilized herbs to treat illnesses and preserve health. A wealth of knowledge on the traditional aspects of therapeutically significant natural ingredients, their usage in skin and hair care, and folklore practices across the nation may be found in a variety of literatures. Utilizing the photochemical process has a lot of potential. components of hair care products; in fact, they are in charge of giving the body nourishment

Herbs are frequently used as components in conditioners, shampoos, and rinses and have long been connected to hair care. In the paper, we report on the development and evaluation of polyherbal hair care powder



Sr. No	Constituents	Biological source/Family	Uses
1	Amla fruit	Dried ripe fruits of <i>Embelica officinalis</i> (Euphorbiaceae)	Darkening of hairs and Hair growth promoter
2	Hibiscus Leaf	Dried leaves of <i>Hibiscus rosea</i> (Malvaceae)	Prevents hair loss and hair growth promoter.
3	Neem leaf	Dried leaves of <i>Azadirachta indica</i> (Meliaceae)	prevent the dryness of hairs and flaking of hairs
4	Shikakai fruit	Dried pods of <i>Acacia concinna</i> (Mimosaceae)	Foam base and antidandruff
5	Fenugreek powder	Dried seeds of <i>Trigonella foenum graecum</i> (Leguminosae)	Conditioner and moisturizing effect
6	Tulsi powder	Dried leaves of <i>osimum sanctum</i> (lamiaceae)	Act as an anti-bacterial agent
7	Lemon leaf	Dried leaves of <i>citrus limon</i> (rutaceae)	Anti-dandruff, natural cleanser, ph modifier
8	Ritha fruit	Dried fruits of <i>Sapindus mukorossi</i> (Sapindaceae)	Detergent and antidandruff
9	Chia seeds powder	Dried powder of <i>salvia hispanica</i> seeds (lamiaceae)	Reducing inflammation and promote growth of hairs
10	Guava leaf powder	Dried leaves of <i>psidium guajava</i> (myrtaceae)	Promote growth of hairs and make hair thicker

Table No:1 Herbs used in the preparation of polyherbal shampoo powder

AMLA:

Synonyms: Emblica, Indian goose berry, amla

Family: - Euphorbiaceae

Biological source: - this consist of dried, as well as fresh fruit of the plant *Embelica officinalis gaerth* (*Phyllanthus emblica linn*) **Uses:** fruits are diuretics, gives cooling effect, laxative effect, dried fruits is used in haemorrhage, used diarrhoea, dysentery, darkening of hairs and growth promoters.

HIBISCUS:

Synonyms: bombix, bombycella bon kopahi.

Biological source: - it is a flowering plant of mallow family

Family: - malvaceae

Uses: - it is used as a natural shampoo to maintain scalp, also used as an antidandruff agent, manage blood sugar, cancer prevention

NEEM:

Synonyms: - margosa, neem tree, Indian lilac

Family: -Meliaceae

Biological source: Neem is the fresh or dry leaves and seed oil of *Azadirachta indica*

Uses: - moisturising, cooling, antibacterial, antiseptic, antifedant.

SHIKAKAI:

Synonyms: - saptala, sage, chaemalanta.



Biological source: - it is the dried gummy exudation of stem and branches of *acacia arabica*.

Family: - *Leguminosae*

Uses: - cleanses the scalp without affecting its natural pH, promotes hair growth, heals wounds faster, control bleeding piles due to its astringent properties, reduces white flakes, treats dandruff.

FENUGREEK:

Synonyms: - Chandrika, alholva, fenogreco.

Biological source: - it is a dried seeds obtain from *Trigonella foenum-gracum*

Family: - Fabaceae

Uses: - hair growth, used in cooking as flavouring agent, used in traditional medicine to treat diabetes, as a dietary supplement, used to increase milk supply in breastfeeding mothers

TULSI:

Synonyms: sacred basil, holy basil

Biological source: Tulsi consists of fresh and dried leaves of *osimum sanctum linn*

family: - *Labiatae*

Uses: oil is used as antibacterial and insecticidal, used as stimulant, several preparations for skin diseases, leaves is used as stomachic, prevent hair loss, reducing dandruff.

LEMON:

Synonyms: cortex limonis

Biological source: lemon is the ripe or nearly ripe fruits and evergreen tree in the leaf of *citrus limonis burm*

family: - *rutaceae*

Uses: it is used as carminative and stimulant, oil is used as perfuming and flavouring agent, lemon juice citric acid can lighten hairs, removes scalp of hair, antidandruff agent.

RITHA FRUIT:

Synonyms: - aritha, soapnut, soapberry

Biological source: - ritha is dried fruit obtain from *spindus mukorossi* or Chinese soapberry.

Family: - sapindace

Uses: - it is used to control dandruff, prevent hair loss, give strength to hairs, used as body wash to manage skin infections, heal the wounds on skin, it may also have de-tanning properties.

CHIA SEEDS:

Synonyms: chian, salvia chia, salba, black chia

Biological source: chia is a flowering seed comes from the *salvia hispanica*

Family: *lamiaceae*

Uses: it is used in blood sugar control, good source of calcium, higher in fibre to induce bowel movements, contains omega-3 fatty acid which is good for hair growth, protein which support hair structure, zinc and copper which prevent thinning of hair.

GUAVA:

Synonyms: jam, Peru, amrood, amrutam

Biological source: guava is a dried extract of *Psidium guajava leaves*

Family: *myrtaceae*

Uses: antimicrobial agent, anti-cancer, antidiabetic, antioxidant, prevent dental carries, prevent hair fall, hair growth, strengthen the weak hairs.

II. MATERIAL AND METHOD

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2.1 Acquisition of material

The distinctive parts of the plants were chosen for the ponder having hair care property. plants are Amla natural product (*Emblca officinalis*), Hibiscus Leaf (*Hibiscus rosea*), Neem leaf (*Azadirachta indica*) Shikakai fruit (*Acacia concinna*),

The choice of active ingredients for hair care powder is frequently based on the ingredient's capacity to both prevent skin damage and improve skin quality by cleansing, nourishing, and protecting the skin.

Aloe leaf (*Aloe barbadensis*), Henna Leaf (*Lawsonia inermis*), Brahmi root (*Centella asiatica*), Rith fruit (*Sapindus mukorossi*) 5,6 The powder of Amla natural product, Hibiscus Leaf, Neem leaf, Shikakai natural product, Aloe leaf, Henna Leaf, Ritha natural product was collected from the neighborhood advertise.

The crude materials collected were given with their individual natural source and employment in **TABLE NO 1**

Total three batches of each preparation were prepared labelled and kept in close container in ascending order by weight with continuous trituration

All the required powder for shampoo preparation were weighed individually and passed through sieve no. 120 mesh and mixed for further studies. The preparation formula for PHS1, PHS2, PHS3, were given in **TABLE NO 2**.

Table No: 2 Formula for the shampoo powder

Sr. No	Constituents	PHS1	PSH2	PHS3
1	Amla fruit	30	25	28
2	Hibiscus Leaf	15	20	17
3	Neem leaf	10	10	10
4	Shikakai fruit	10	12	08
5	Aloe leaf	2	2	2
6	Henna Leaf	2	2	2
7	Brahmi root	5	5	5
8	Ritha	5	5	5

III. EVALUATION OF SHAMPOO POWDER

3.1.1 organoleptic evaluation/visual appearance: Organoleptic evaluation for parameters such as color, odor, taste, and texture were conducted; for taste and odor evaluation, a team of five individuals who are sensitive to taste, and odor was selected

3.1.2: General powder characteristics These characteristics include evaluation of those parameters that will affect the external properties (such as flow properties, appearance, packaging criteria, etc.) of the preparation. Particle size, angle of repose, bulk density, and tapped density are evaluated under this section. All three shampoo powders were taken at three different levels—the top, middle, and lower level for the evaluation.

3.1.3: Particle size is a metric that can impact a number of characteristics, such as grittiness and spreadability. The particle size was measured using the I.P. Standard sieves and mechanical shaking for ten minutes.

3.1.4: Angle of repose A powder's flow characteristics are influenced by its angle of repose. The fixed glass funnel technique was used to find that the graph paper and the bottom of a powder should be kept 2 cm apart. The flow continued until the heap's top touched the funnel's bottom tip.

3.1.5: Bulk density is a crucial characteristic for product homogeneity and packaging. Particle size, particle size distribution, and cohesion all affect bulk density. A weighted quantity of powder was added to a 100 ml graduated cylinder in order to measure bulk density. Bulk density was estimated, and the cylinder is mounted on a bulk density device. Grams per cubic centimeter (g/cm³) is the unit of measurement.

The density that is taped

The increased bulk density that results from physically tapping a container holding the powder sample is known as the "tapped density." The measuring cylinder or vessel is mechanically tapped for one minute after the initial powder



volume or mass has been measured, and readings of the volume or mass are taken until there is little more change in either. Grams per cubic centimeter (g/cm³) was the unit of measurement.

3.2: Physicochemical analysis

3.2.1: Values of extracts

Alcohol-Soluble Extractive Determination In a closed flask, 5 g of each air-dried polyherbal shampoo powder was weighed, macerated with 100 ml of alcohol of the designated strength for 24 hours, shaken regularly every 6 hours, and left to stand for 18 hours. To prevent solvent loss, 25 milliliters of the filtrate were dried in a shallow dish with a flat bottom, dried at 1050 degrees Celsius, and weighed to a consistent weight. In relation to the medication that was air-dried, the percentage of alcohol-soluble extractive was computed.

3.2.2: Water-Soluble Extractive Determination followed the instructions to determine the alcohol-soluble extractive, substituting chloroform water for ethanol. For every sample, the proportion of water-soluble extractive was determined.

Value of Ash Calculating the Total Ash Five grams of each air-dried polyherbal shampoo powder were weighed, placed in a tare silica crucible, and burned in a muffle furnace at a temperature of no more than 4500C until carbon was removed. The mixture was then cooled. A percentage of the total amount of ash was computed.

3.2.3: Water-Soluble Extractive Determination used chloroform water in place of ethanol and proceeded as directed to identify the alcohol-soluble extractive. The percentage of water-soluble extractive was calculated for each sample.

Ash's worth How to Determine the Total Ash

After weighing five grams of each air-dried polyherbal shampoo powder, they were put in a tare silica crucible and heated to a maximum of 4500C in a muffle furnace until the carbon was gone. After that, the mixture was chilled. It calculated a percentage of the total amount of ash.

3.2.4: Determining the moisture content

A tare evaporating dish containing 10 g of each polyherbal shampoo powder was weighed and maintained at 1050C in a hot air oven. Drying was repeated until, after a 30-minute break, a consistent weight decrease was noted. For every sample, the moisture content was determined.

3.2.5: pH determination: At room temperature (25°C), the pH of a 10% shampoo solution in distilled water was measured. A digital pH meter was used to measure the PH.

Cleaning procedure

In a flask, 200 milliliters of water containing one gram of each polyherbal shampoo powder were added to five grams of wool yarn that had been soaked in grease. The water's temperature was kept at 350 degrees Celsius. For four minutes, the flask was shaken fifty times each minute. After removing the solution, the sample was extracted, dried, and weighed.

The following formula was used to determine how much oil had been removed:

$$DP = 100(1-T/C)$$

where C is the weight of grease in the control sample, T is the weight of grease in the test sample, and DP is the percentage of detergency power.

Capacity for foaming:

Despite having nothing to do with shampoos' capacity to clean, foam creation is crucial to consumers and is thus a crucial factor to consider when assessing shampoos. Foaming ability was assessed using the cylinder shaking method. A 250 ml graduated cylinder was filled with 50 ml of the 1% shampoo solution, and the cylinder was covered with the hand and shook ten times. Following a minute of shaking, the total quantities of the foam contents were noted. Only the foam volume was computed. Immediately following shaking, the volume of foam for each of the three shampoo powders was measured at 1-minute intervals for four minutes.



Dirt dispersion18:

A large test tube containing 10 ml of distilled water was filled with two drops of 1% shampoo powder and one drop of India ink. The test tube was sealed and shaken ten times, and the amount of ink in the foam was estimated to be None, Light, Moderate, or Heavy.

Detergency ability19:

The Thompson method was used to assess the samples' detergency ability. In short, a crumple of hair was washed and dried and separated into 3g weight groups after being treated with a 5% sodium lauryl sulfate (SLS) solution. An n-hexane solution containing 10% fake sebum was used to suspend the samples, and the mixture was agitated for 15 minutes at room temperature. Following sample removal, the solvent was allowed to evaporate at room temperature, and the amount of sebum in the samples was measured. Each sample was then split into two equal halves, one of which was used as the negative control and the other to be cleaned with 0.1 ml of the 10% test shampoo. Following drying, samples' sebum was removed using 20 milliliters of n-hexane and weighed again. Lastly, the following formula was used to determine each shampoo powder's % detergency power:

$$DP = 100(1-T/C)$$

where T is the weight of sebum in the test sample, C is the weight of grease in the control sample, and DP is the percentage of detergency power.

Time spent wetting (20, 21)

The canvas was divided into discs with a 1-inch diameter and an average weight of 0.44 g. The stopwatch began when the disk (Page 155) floated on top of a 1% w/v shampoo solution. The wetting time was determined by carefully measuring the amount of time needed for the disc to start sinking.

Nature of hair after washes

22 washes Volunteer answers can be gathered to determine the kind of hair after washing.

Study of Stability 23, 24

The formulations' acceptability and stability of their organoleptic qualities (color and odor) during the course of storage demonstrated their chemical and physical stability.

IV. CONCLUSION

According to the study's findings, the synthesized herbal shampoo powder composition was similar to commercial shampoos in a number of aspects. According to our research, prepared herbal shampoo powder is advised as a preferred option for reasonably priced care products.

The potential of plant extracts for cosmetic applications is the main focus of this work. Therefore, we draw the conclusion that the polyherbal shampoo powder formulation effectively reduces dandruff without causing irritation, having fewer negative effects, and improving conditioning. The current studies were conducted in order to define a few criteria for the quality and purity of herbal powder shampoo and to make the herbal shampoo powder preparations based on traditional knowledge.

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