



PREPARATION AND EVALUATION OF NOVEL POLYHERBAL SHAMPOO POWDER

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ABSTRACT:

The aim of the present study is to formulate and evaluate herbal shampoo powder 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 products used in daily as the hair is special and cherished feature of humans. Hair care products is additionally define because the preparation which are meant for cleansing, modifying the feel, changing of the colour, giving life to the stressed hair, providing nourishment to the tresses and giving the well appearance to the hair. Specialty shampoos are marketed to people with dandruff, color-treated hair, gluten or wheat allergies, a concentration in using an organic product, and newborns and young kid's baby shampoo may well a smaller amount irritating. There also are shampoos intended for animals which will contain insecticides or other medications to treat skin conditions or parasite infestations like fleas. As the selected drugs being used since long time as single drug or in combination, present investigations will further help to establish a standard formulation and evaluation parameters, which will certainly help in the standardization for quality and purity of such type of herbal powder shampoos.

KEY WORDS: Herbal Shampoo, Evaluation, Standardization, Anti-Dandruff, Anti-microbial, Mukuroziosides, Lawsone.

INTRODUCTION:

Hairs are the integral part of human beauty. People are using herbs for cleaning, beautifying and managing hair since the ancient era. As the time has passed synthetic agents have taken a large share but today people are getting aware of their harmful effects on hairs, skin and eyes.^[1] These regions attracted to community towards the herbal products, which are less expensive and have negligible side effects. Hair cleansers or shampoos are used not only for cleansing purpose but also for imparting gloss to hair and to maintain their manageability and oiliness for hairs^[2] Shampoos are of various types, like powder shampoo, clear liquid shampoo liquid shampoo, lotion shampoo, solid gel shampoo, medicated shampoo, liquid herbal shampoo etc. As far as herbal shampoos are concerned in stability criteria.^[3] Depending upon the nature of the ingredients they may be simple or plain shampoo, antiseptic or antidandruff shampoo and nutritional shampoo containing vitamin, amino acids proteins hydrolysate^[4]

Hair Anatomy: [2, 4]

The root is that the portion of the hair deep into the surface that penetrated into the dermis and sometimes into the subcutaneous layer. The shaft and root both encompass three concentric layers.

- **Medulla:** it's the central a part of the shaft and is mostly noticeable in thick hairs. it's composed of two or three rows of polyhedral cells containing pigment granules and air spaces.
- **Cortex:** it's located peripheral to the medulla and forms the key a part of the shaft. It entails of elongated cells, encompassing pigment granules in dark hair though air in white hair
- **Cuticle:** it's the outermost layer of the hair and consists of one layer of thin, flat cells which are heavily keratinized.

Structure of hair: [4, 5]

In this context it's the character of the hair shaft which is of primary interest. It's structure is also described as follows. The greater part of the shaft is made of elongated keratinized cells linked together to create the cortex of the hair fibre. The cortex is enclosed by a cuticle derived from one strand of cells within the bulb of the foundation, which becomes a surface structure of the hair fibre five to 10 cell layers thick.

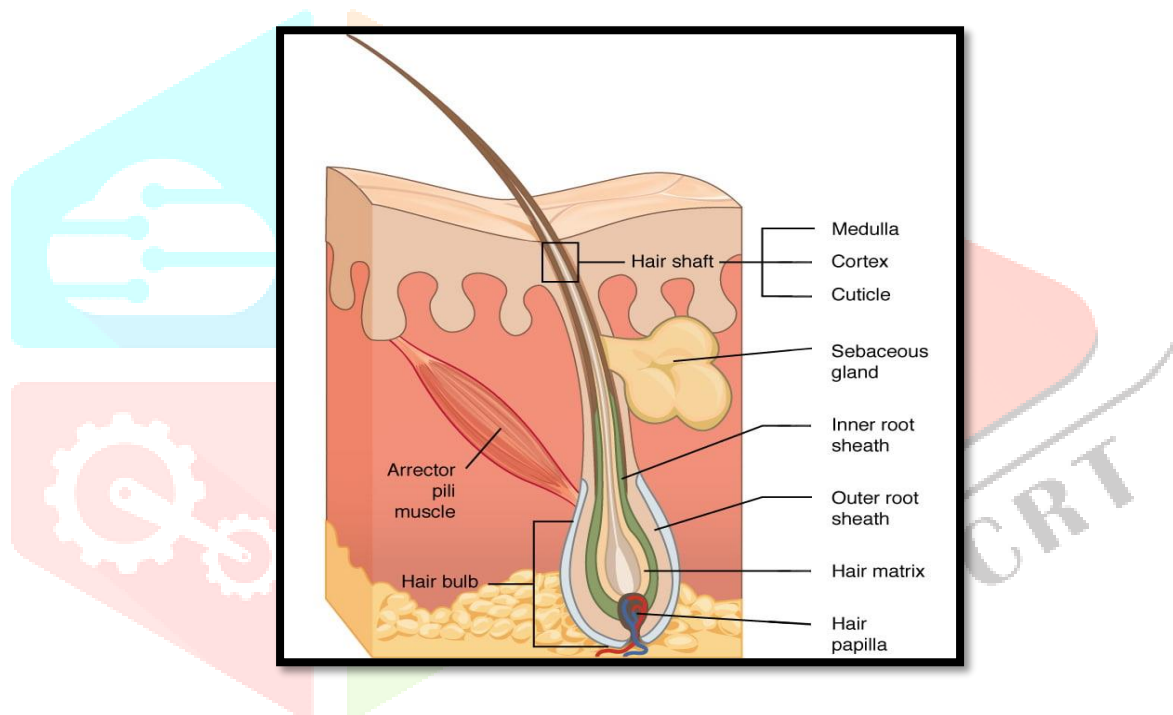


Fig.1: Structure of Hair.

Parts of the Hair: [5,6]

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, particularly the outer root sheath, the inner root sheath and the hair shaft. Combined, the matrix and the dermal papillae make up the hair bulb.

Outer root sheath: The outer root sheath, or tricholemma, is the outermost part of the hair and is keratinized. It covers the entire hair follicle inside the dermis and then transitions through to the epidermis, providing the hair follicle with an opening from which to surface from.

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 with the purpose of stabilizing the hair. The cuticle, which is the innermost part that it closest to the hair shaft, is made from dead

hardened cells and give the hair shaft added protection. This, together with the capsular layers that make up the Henley's and Huxley's layers, secures the hair and allows it to grow in length.

Hair shaft: The hair shaft is the solitary part of the hair follicle that fully exits the surface of the skin. The hair shaft is made up of three layers: the medulla, cortex, and the cuticle. The medulla is described as an unsystematic and unstructured area located in the innermost region of the hair shaft and is not always present. The cortex, in contrast to the medulla, is highly structured and organized. The cortex is made up of keratin and is responsible for giving hair its strength and durability, as well as its water uptake. The cortex also contains melanin and determines the color of hair based on then number, distribution and types of melanin granules present. The cuticle is the hair's outer protective layer and is connected to the internal root sheath. It is a complex structure with a single molecular layer of lipids that helps hair repel water.

HAIR PHYSIOLOGY: [5,6,7]

i) Anagen (growth phase): Most hair is growing at any given time. Each hair spends several years in this phase.

ii) Catagen(transitional phase): Over a few weeks, after hair growth slows and the hair follicle Shrink.

iii) Telogen (resting phase): Over months, hair growth stops and the old hair detaches from the hair follicle. A new hair begins the growth phase, pushing the old hair out.

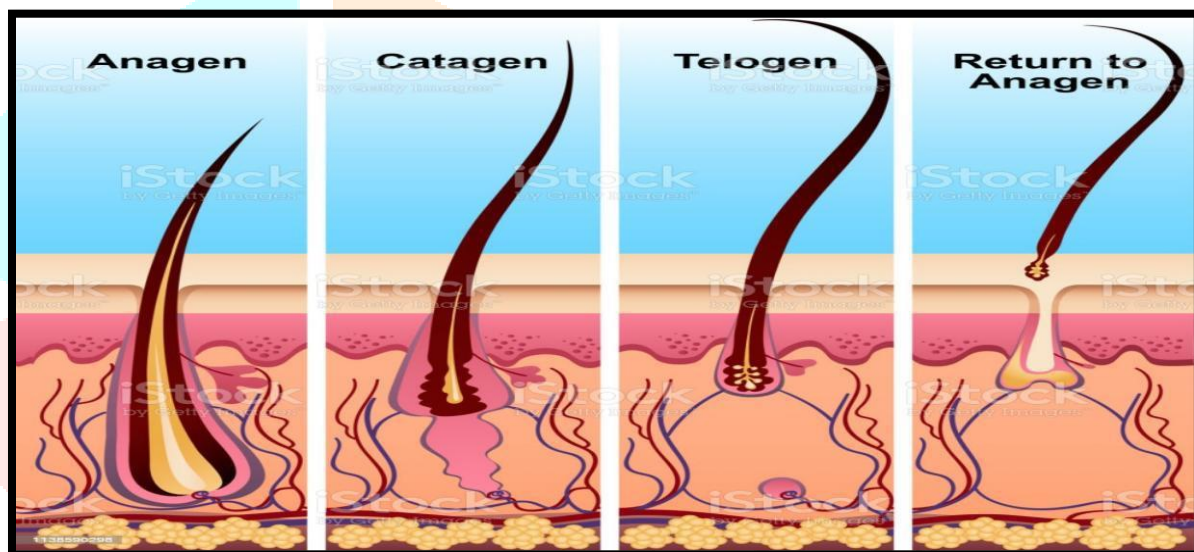


Fig 2: Stages of hair growth or hair growth cycle.

Growth of hairs: [7,8]

A typical growth rate for human scalp hair is 0.3-0.5 millimeters (mm) per day. A healthy scalp (the top of the head extending from one inch above the ear) supports something of the order of 1000000 hair follicles. Workers have considered it as high 2000000 hair follicles. The bulk of the hair is made up of the cortex, the cell which is toughly high in Indians. The straight hair of the Chinese and Japanese has virtually no orthocortex, while the crimped hair of Negroes has an easily recognized band of orthocortex.



Fig 2: Human hair growth

Hair care products are additionally defined because the preparations which are meant for cleansing, modifying the feel, changing of the colour, giving life to the stressed hair, providing nourishment to the tresses and giving the well appearance to the hair. Specialty shampoos are marketed to people with dandruff, color treated hair, gluten or wheat allergies, an concentration in using an organic product, and newborns and young kids baby shampoo may well a smaller amount irritating. There also are shampoos intended for animals which will contain insecticides or other medications to treat skin conditions or parasite infestations like fleas. Shampoo is made of surfactant, most often sodium lauryl sulfate, with a co-surfactant, most often cocamidopropyl betaine in water to produce a thick, viscous liquid. Other important components include salt (sodium chloride), which is made use of to control the viscosity, a preservative and fragrance. Further constituents are generally involved in shampoo preparations to maximize the subsequent abilities: pleasurable lather, modest cleaning, minor skin and eye irritation, thick or creamy feeling, pleasant perfume, low toxicity, good biodegradability, slight acidity (pH but 7), no damage to hair, repair of harm already done to hair.

PROBLEMS RELATED TO HAIR: [5, 8]

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

DANDRUFF: [8,9]

- It is a harmless, chronic condition that occurs when the scalp becomes dry or greasy and produces white flakes of dead skin that appear in the hair or on the shoulders.
- Although it is harmless, dandruff can be embarrassing for those who have it.
- Skin cells are formed continuously on the scalp, so the shedding of the dead skin cells is normal process. With dandruff, however skin cells are shed at a faster rate than normal. oil from the scalp causes the skin cells to clump together and appear as white flakes.

CAUSES OF DANDRUFF: [7, 9]

- Dry skin.
- Irritated, oily skin.
- Not shampooing often enough
- Other skin conditions:
 - A. Eczema
 - B. Psoriasis
 - C. Seborrheic dermatitis
- Malassezia-yeast like fungus
- Sensitivity to hair products (contact dermatitis)

TREATMENT:

- Follow a healthy diet.
- Avoid stress.
- Shampoo use a combination of special
- Ingredients to control dandruff.

SHAMPOO:

A Shampoo is a preparation of a surfactant in a suitable form –liquids,solid or powder-which when used under the specified conditions will

- Remove surface grease
- Dirt and
- Skin debris

From the hair shaft and scalp without adversely affecting the user.

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.
- Keeps your hair beautiful and blossomed.

IDEAL PROPERTIES OF SHAMPOO: [5,6]

- 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
- Low toxicity
- Slightly acidic (ph less than 7) since a basic environment weakens the hair by breaking the disulphide bonds in hair keratin.

ACTION OF SHAMPOO:**Fig 3: Action of Shampoo****TYPES OF SHAMPOO:** [4,5,7]

1. **Powder shampoo:** It is available in the form of dry powder, initially it was prepared from dry soaps, but nowadays dry synthetic detergents are used for their preparation. Powder shampoo is prepared where addition of water or other solvent reduces the activity of the components, especially in case of medicated shampoo. Nowadays, these shampoos are not used due to the difficulty experienced in their application.

2. **Liquid shampoo:** These are clear liquid preparations that are most widely used. They are usually made by using detergent of low cloud point. Some of that shampoo may be transparent.

3. **Cream shampoo:** These are called as lotion shampoos which are modification of clear liquid cream shampoos. Solubilising agents such as magnesium stearate is also used to dissolve the added opacifier.

4. **Jelly shampoo:** These are transparent and thick usually made by incorporating a gelling agent, (e.g., cellulose). There is great use in hair salons and beauty parlors. The principle ingredient is detergent which can be used either alone or in combination with soap. By altering the proportion of detergent, gel of required consistency can be obtained. Addition of methyl cellulose to clear liquid shampoo and its subsequent thickening also gives rise to gel shampoo.

5. **Aerosol shampoo:** They are called aerosol shampoos because they are packed in aerosol containers. Their formulation, preparation and packing is complicated as an additional propellant is included. The propellant added must be compatible and should not reduce the activity of shampooing ingredients. The container opening is provided with a valve. Shampoo comes out as foam when the valve is pressed. Hence also called as foam type shampoo.

6. **Keratin shampoo:** When your shampoo (or any hair care product) is infused with keratin oil, you reap benefits that nourish and condition the hair. This helps it look shiny and smooth. It also helps to fight frizz, tame fly always, and protect against damage caused by styling tools like a straightening iron or blow dryer.

7. **Volumizing shampoo:** Volumizing or volume shampoos make hair appear fuller, bouncier and more full of body. It's more about the texture of the hair than the thickness of the hair strands. Instead, volumizing shampoos should be lightweight enough to not weigh down your hair, thus creating more body in the end.

8. **Specialised shampoo:** Speciality shampoos are marketed to people with dandruff, color-treated hair, gluten or wheat allergies, an interest in using an organic product, infants and young children ("baby shampoo" is less irritating).

A. Conditioner

B. Anti dandruff

C. Baby

- D. Two layer
- E. Anti hair fall

HERBAL SHAMPOO: [3, 5, 8]

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

Advantages of Herbal shampoos over synthetic chemical shampoos: [9, 10]

1. The cleansing action of the synthetic cleansers/ shampoo aims basically to remove oil content from the hair leaving the hair dry and damaged, whereas herbal shampoos aim at delivering essential nutrients to the hair and at the same time have a mild cleansing effect to remove the unwanted oily content.
2. The conditioning effect that is provided by herbs is more beneficial to the hair whereas the synthetic conditioners play with different types of charge inducers which may damage hair permanently.
3. In general, synthetic anti-dandruff shampoo make use of climbazole that helps in getting rid of dandruff temporarily but herbal shampoo uses the goodness of ginger, neem which removes dandruff-causing organisms.
4. Modern shampoos use silicones for silky hair which is not good for human use and also for the environment. However, the same silkiness can be obtained by using herbs like hibiscus.
5. The herbal/ herb extracts have the same efficacy and results when used in modern dosage forms like that of those when used alone.
6. Herbal shampoos are bio-degradable, earth-friendly, and are free from side effects.
7. Apart from this, the use of herbal shampoo help in revenue to many of the farmers at least to earn their livelihood through whom the herbs are sourced.

NEED OF SHAMPOO:

The skin on our head produce a greasy fluid called sebum. It is produced to protect the hair by coating itself all over the head. This give the hair a healthy shine but when secretes in large amount it makes the hair look dirty.

HISTORY:

Indian subcontinent In the Indian subcontinent, a variety of herbs and their extracts have been used as shampoos since ancient times. A very effective early shampoo was made by boiling Sapindus with dried Indian gooseberry (amla) and a selection of other herbs, using the strained extract. Sapindus, also known as soapberries or soapnuts, a tropical tree widespread in India, is called ksuna. In ancient Indian texts and its fruit pulp contains saponins which are a natural surfactant. The extract of soapberries creates a lather which Indian texts called phenaka. It leaves the hair soft, shiny and manageable. Other products used for hair cleansing were shikakai (Acacia concinna) hibiscus flowers, ritha (Sapindus mukorossi) and arappu (Albizia amara). Guru Nanak, the founder and the first Guru of Sikhism, made references to soapberry tree and soap in the 16th century. Cleansing with hair and body massage (champu) during one's daily bath was an indulgence of early colonial traders in India. When they returned to Europe, they introduced the newly learned habits; including the hair treatment they called shampoo.

AIM

Preparation and evaluation of polyherbal powder shampoo

OBJECTIVE

As we know that now a days synthetic shampoos are very harmful for the hairs which can cause the damage, hair fall, dandruff in the hairs. Hence our motive to formulate the herbal powder shampoo is that the natural ingredients like Henna, Reetha, Shikakai, Hibiscus etc. are used for the best result on hair treatment.

- Prevent hair fall
- Anti-dandruff property
- Promote hair growth

- Anti-microbial agent

MATERIAL AND METHODOLOGY

1. Henna:-

Synonym: Egyptian Privet *Lawsonia Alba*.

Biological Source: It is a fresh or dried leaves of *Lawsonia Inermis* belonging to

Family: *Lythraceae*.

It is biennial dicotyledonous herbaceous shrub. A native of North Africa and South-West Asia, the plant is now widely cultivated throughout the tropics as an ornamental and dye plant.



Fig 4: Henna

- **Organoleptic Properties-** Color-Greenish brown, Odour -Characteristics Taste-Bitter
- **Chemical Constituents-** The main constituent of henna is Lawsone (0.5-1.0%).
- **Other constituents are-** Gallic Acid, White Resin, Sugars, Tannins, Xanthenes, Pinens, Glycoside-Hemoside (A, B and C)

Uses-

- Henna improves hair growth-The natural properties of henna promote hair growth. The powder can be used to create an essential oil that nourishes and encourages growth.
- Henna reduces hair fall- By incorporating henna powder in hair dye or shampoo reduces hair fall.
- Henna conditions your hair-Henna is a deep conditioner that leaves your hair feeling absolutely gorgeous.
- Henna prevents dandruff-Using henna regularly on your hair cures dandruff and prevents it from coming back.
- Henna repairs splits ends-Dry and damaged hair is prone to split ends, which worsen the situation.
- Henna breaks this viscous cycle and gives you deeply conditioned and nourished hair.

2. Orange Peel:

Orange Peel is consists of fresh and dried outer part of the pericarp of *citrus aurantium Linn.*

Family: *Rutaceae*

Organoleptic Properties: Colour Dark orange reddish , Odour: Aromatic

Chemical Constituents: Orange peel contains of 1 to 2.5% volatile oil is 90% limonene and small quantities of aldehydes citral, citronellal, bitter amorphous glycoside like aurantiamarin and its acid; hesperidin, isohesperidin, vitamin C, and Pectin.



Fig 5: Orange Peel

Uses:

- 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

3. Reetha:

- **Synonym-** Reeetha, Soapnut, Washnut, Aritha.
- **Biological Source-**It is dried fruits of species of *Sapindus Mukorossi* belong to **family Sapindaceae**.
- **Organoleptic Properties-** Color-Dark brown to Black Odour-Characteristics Taste-Bitter
- **Chemical Constituents-**The main constituent of reetha is Saponins. Other constituent are, Sopindic acid, Oleanolic acid, SapindosideA&B, Mukuroziosides, Trifoliosid.



Fig 6: Reetha

Uses-

- Reetha is employed because the main ingredient in soaps and shampoos for laundry hair, because it is taken into account good for the health of hair.
- Reetha is additionally used for removing lice from the scalp, because it has gentle insecticide properties.
- It is employed as cleanser, surfactant .In addition, it's used for the treatment of eczema, psoriasis, and for removing freckles.
- The plant is thought for its antimicrobial properties.

4. Hibiscus:

- **Synonym**-Hibiscus rosa-sinensis, Hibiscus cooperi auct.
- **Biological Source:** Hibiscus is a genus of flowering plant in the *mallow* belonging to family *Malvaceae*.
- **Organoleptic Properties-** Color-white to pink, red, orange or yellow. Odour-Aromatic.
- **Chemical Constituents**-The constituents of hibiscus are, Citric acid, Mallic acid, Tartaric acid, Galactose.

**Fig 7: Hibiscus****Uses-**

- Due to presence of antioxidant. it gives healthier hair.
- It conditions hair mildly and keeps them bouncier.
- It can even be used as pH indicator.

5. Shikakai:-

- **Synonym**- Satala, Virala, Tatphala.
- **Biological Source**-Dried fruits of *Acacia Concinna* belonging to family *Fabiaceae*.
- **Organoleptic Properties-** Color-Dark brown. Odour-Characteristics.
- **Chemical Constituents**-The chemical constituents of shikakai are, Spinosterol, Acacia acid, Lactone, Glucose, Arabinose.



Fig 8: Shikakai

Uses-

- Shikakai gives healthy, beautiful and bouncy hair causes you to look beautiful.
- It is rich in anti ophthalmic factor, D, E and K and other antioxidants which very essential for healthy and quick growth of hair naturally.
- Shikakai is employed in many shampoos and hair medicines for its hair strengthening and conditioning properties.

EXPERIMENTAL WORK

FORMULATION OF HERBAL SHAMPOO:

Sr. No.	Ingredients	Quantity used for 100%	Uses
1	Henna	5 %	Anti-dandruff agent
2	Orange Peel	10%	Promote Hair growth
3	Shikakai	20%	Detergent
4	Neem	2.5%	Antimicrobial Agent
5	Potassium carbonate	7.5%	Alkali
6	Borax	15%	Saponifier
7	Reetha	10%	Detergent
8	Ginger	10%	Prevent hair loss
9	Amala	5%	Promote hair growth
10	Peppermint	5%	Cooling Agent
11	Lemon Grass	10%	Antibacterial agent
12	Perfume	0.2%	Fragrance

METHODOLOGY:

Drying all the powder are in dry form and grinded
 ↓
 Weighing all the required powder for the formulation
 ↓
 Size reduction the crude drug ingredients were collected and these ingredients were size reduced using mixer individually
 ↓
 Mixing All these fine ingredients were mixed thoroughly by mixer to form homogeneous fine powder
 ↓
 Sieving Then this fine powder was passed through Sieve no.120, for getting fine powder material

EVALUATION PARAMETER:**1. Physical Appearance:** ^[11]

A. Colour and Appearance: The colour & appearance of the formulation was observed visually.

Odour: The odour of the formulation is pleasant/ characteristics.

Consistency: It is found to be semi-solid with visually observation.

B) General powder characteristic: ^[7, 9]

General powder characteristics include evaluation of those parameters which are going to affect the external properties (like flow properties, appearance, packaging criteria, etc.) of the preparation. Characteristics evaluated under this section are powder form, particle size angle of repose, and bulk density. Sample for all these evaluations are taken at three different levels i.e. from the top, middle and lower levels.

i) Particle size

Particle size is a parameter, which could affect various properties like spread ability, grittiness, etc., Particle size is determined by the sieving method by using I.P. Standard sieves by mechanical shaking for 10 Min.

ii) Angle of repose

It is defined as the maximum angle possible in between the surface of the pile of powder to the horizontal flow.

Funnel method

Take required quality of the dried powder in a funnel placed at a height of 6 cm from a horizontal base. Allow the powder to flow to form a heap over the paper on the horizontal plane. Note the height and radius of the powder and record the angle of repose (θ) by using the formula. Place required amount of dried powder in a cylindrical tube open at both ends on a horizontal surface. Then raise the funnel to form a heap. Record the height and radius of the heap. For the above two methods, the angle of repose (θ) can be calculated by using the formula.

$$\theta = \tan^{-1}(h / r)$$

Where, θ – Angle of repose,

h – Height of the heap,

r – Radius of the base

iii) Bulk density

Bulk density is the ratio between the given mass of a powder and its bulk volume. Take the required amount of dried powder and fill it in a 50 ml measuring cylinder up to 50 ml mark. Then drop the cylinder onto a hardwood surface from a height of 1 inch at a 2-second interval. Measure the volume of the powder. Then weigh the powder. This is repeated to get average values. The bulk density is calculated by using the below-given formula.

Bulk density = mass of the polyherbal powder shampoo

Volume of the polyherbal powder shampoo

iv) Tapped density

The tapped density is an increased bulk density attained after mechanical tapping a container containing the powder sample. Observe the initial powder volume or mass, tap the measuring cylinder or vessel mechanically for 1 min and take volume or mass readings until little further volume or mass change was observed. It was expressed in gram per cubic centimeter (g/cm³).

Weight of powder

Tapped density= -----

Tapped volume of powder

2. pH: When it come to the P^H of your skin it's reliant on the skin acid mantle. This acid mantle protect skin against external influence like bacteria, allergens& pollution, while maintaining moisture for your skin to stay balance your acid mantle will naturally stay slightly acidic with a P^H of around 4.5-5.9. When it comes to the P^H of your skin it's reliant on the skin acid mantle. This acid mantle protect skin against external influence like bacteria, allergens& pollution, while maintaining moisture for your skin to stay balance your acid mantle will naturally stay slightly acidic with a P^H of around 4.5-5.9.

Dip the pH electrode into formulation stir it with magnetic bar (~305) with the identical stirring rate as for calibration for best result.

- The Ph is completed when the pH reading is stable.
- Record the pH value (temperatures if needed).^[13]

3. Washability: ^[16]

Little quantity of scrub was applied over the skin & was washed with water it absolutely was easily washable.

4. Solubility: ^[6]

Solubility indicates the utmost amount of a substance that may be dissolved in an exceedingly solvent at a given temperature. Such an answer is termed saturated. Divide the mass of the compound by the mass of the solvent and so multiply by 100 g to calculate the solubility in g/100g.

5. Loss of drying: ^[17]

Loss of drying is the loss of mass expressed in percent m/m. Weigh Two gram of powder and transfer into a dry Petri dish. Place the Petri dish in a desiccator for 2 days over calcium chloride crystals. Then take the powder and weigh accurately to find out the weight loss during drying.

6. Skin irritation test: ^[18, 19]

Perform skin irritation test by using the open patch method.

With many cosmetic products, whether commercial or homemade, it is recommended to do a patch test on skin before use. This is to ensure that no allergic reaction is seen for the product and if so, it will only be confined to a small area of skin and thus treatable with ease.

Step 1 - Pour or squeeze out a little of the cosmetic preparation to your wrist.

Step 2 - Dab a small amount of the preparation on the pulse of your wrist or the crook of your elbow.

Step 3 - Leave the preparation unwashed for 15-20 min.

Step 4 - Watch for signs of an allergic reaction. Typical signs will include redness, a rash, any form of breakouts on the skin, itchiness, pain, flaking, etc. Some people may also experience nausea or respiratory reactions. If any of these signs present themselves, cease use immediately.

Step 5 - Continue to use the product if you do not react. If you do not have any allergic reaction symptoms, the preparation is likely all right for your skin type.

7. Eye irritation test ^[5, 9]

Collect animals (albino rats) from the animal house. Dip about 1 % of shampoo solutions into the eyes of albino rats with their eyes held open with clips at the lid. Record the progressive damage to the rat's eyes at specific intervals over an average period of 4 seconds. Reactions to the irritants can include swelling of the eyelid, inflammation of the iris, ulceration, hemorrhaging (bleeding), and blindness

8. Extractive values: ^[19, 21]

i) Determination of alcohol-soluble extractive

Weigh 5 g of each air-dried herbal shampoo powder was and macerate with 100 ml of Alcohol of the specified strength in a closed flask for twenty-four hours, shake frequently for six hours, and allow to stand for eighteen hours. Filter, by taking precautions against loss of solvent, 25 ml of the filtrate is evaporated to dryness in a tare flat bottomed shallow dish, and dry at 105 °C, to constant weight and weigh. The percentage of alcohol-soluble extractive concerning the air-dried drug is calculated.

ii) Determination of water-soluble extractive

Proceeded as directed for the determination of alcohol-soluble extractive, using chloroform water instead of ethanol. The percentage of water-soluble extractive was calculated for each sample.

9. Ash value: [21, 23]**i) Total ash content**

Ash value is calculated to determine the inorganic contents which are characteristic of an herb. Take about 2 Gm of powder drug in silicon dish previously ignited and weighed. The temperature is increased gradually by increasing the heat not exceeding to red colour. After complete burning, cool and weigh the ash.

ii) Acid insoluble ash

Acid insoluble ash is calculated by boiling obtained ash with 25 ml diluted HCl for 5 min, insoluble matter is collected in gooch crucible, wash with hot water, ignite, and weigh.

10. Dirt Dispersion: [24]

A one percentage (1%) solution of every shampoo (1 g of sample in 100 mL of water) was taken and one drop of ink was added; the tube was stoppered and shaken ten times. the quantity of ink within the foam was estimated as none, light, moderate, or heavy.

11. Moisture content determination [8, 9]

Weigh 10 g of each herbal shampoo powder in a tare evaporating dish and kept it in a hot air oven at 105°C. Repeat the drying until the constant weight loss is observed after 30 minutes. The moisture content is calculated for each sample.

12. Foaming index [5,7]

Weigh one gram of the powder and transfer into a 250 ml conical flask containing 100 ml of boiling water. Then warm gently for 30 minutes, cool and filter, and make up the volume to 100 ml in a standard volumetric flask. Take this extract in 10 test tubes in a series of successive portions of 1, 2, 3....10 ml, and make up the remaining volume with water to 10 ml. Then shake the test tubes in longwise motion for 15 seconds at speed of 2 frequencies/second. Then allow to stand for 15 minutes. The height of the foam is measured.

Foaming index = $1000/a$

a = height of the foam

13. Wetting time:

The wetting ability of a surfactant is depending on its concentration and is often accustomed test its efficacy. The canvas disc method is quick, efficient and reliable test to judge the wetting ability of a shampoo.

14 Stability Study: [16]

The thermal stability of the shampoos was studied by placing them in glass tubes in a very humidity chamber at 45 °C with 75% ratio also as in an exceedingly refrigerator at 4 °C, and comparing them to the identical shampoos kept at a space temperature of 25°C.

15. Nature of hair after washes: Nature of hair after wash can be done by collecting the responses of volunteers

RESULT:**RESULT OF POLYHERBAL SHAMPOO POWDER:**

Sr. No	Physicochemical Evaluation	Result
1	pH	5.47
2	Washability	Soft Manageable, Easily Washable
3	Solubility	Soluble
4	Skin/Eye irritation Test	No harmful effect on skin or eye
5	Foamability	2.3 cm in height Good Foaming
6	Dirt Dispersion	Moderate
7	Wetting Time	149±0.19
8	Stability	Stable

Presently available marketed products:

- * Organic hair cleanser- by tribe concepts- ingredients include fenugreek, shikakai, reetha.
- * Root strengthening and conditioner- by tribe concepts- ingredients include fenugreek, amla, liquorice.
- * Natural hair shampoo- by Havintha- ingredients includes amla, reetha, shikakai, methi.
- * Herbal organic hair wash- by MahaGro - ingredients include shikakai, reetha, methi, brahmi, amla, hibiscus, bhringraj, kapoorkali.
- * Kesh Jyothi herbal hair wash- by Isha life - ingredients include amla, shikakai, reetha, henna, hibiscus.

CONCLUSION:

Globalization is the need of today and the world market will open for all by 2005. The world market is also moving towards herbal medicines for health care, health foods and for cosmetic purposes including hair preparations. India is rich heritage for cultivation and production of herbal medicines due to its diversified climatic conditions. Indian traditional literature and ethanopharmacological studies present a number of plants/ formulations with proven efficacy for hair care preparations. Present investigations was carried out to formulate the herbal shampoo powder preparations based upon traditional knowledge and to develop few parameters for quality and purity of herbal powder shampoo. Although these studies are preliminary but presented evaluation parameter will be useful for the standardization of herbal shampoo powder. The formulated shampoos were evaluated for the organoleptic, general powder characteristics and physiochemical study, they are also evaluated for their different properties cleaning action, foaming capacity, dirt dispersion, wetting time and nature of hair after wash. Formulation of herbal shampoo powder was found to be in compliance with all the properties of powders and exhibited satisfactory results. The evaluation studies showed good cleaning action, better foaming capacity, and quick wetting time than other formulation batches. From the given study, it can be concluded that all the formulations of herbal shampoo powders prepared were good and had all the properties.

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