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FORMULATION AND EVALUATION OF EGGS WHITEBASED HERBAL SHAMPOO

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ABSTRACT

The shampoo sector is probably the largest unit among the hair care products. Shampoos are one of the cosmetic products used daily as the hair is a special and cherished feature of human being which beautifies the look of every individual. Day by day dependency of people is raising on herbal formulations not only for a chronic ailment but also for several acute problems.

The assurance therapy with minimal side effects has been proven with ayurvedic formulations. In the scenario of changing food habits, stress, and dependent environment conditions, several hairs and skin disorders are encountered. In case of hair disorders like dandruff, hair fall, dull hair, split ends, etc, a proper selection of ayurvedic ingredients with the required amount, the dosage form can be formulated to fight against hair problems.

This polyherbal shampoo was formulated by using natural ingredients like Aloe vera (*Barbadensis miller*), Neem leaves (*Azadirachta indica*), Reetha fruit (*Sapindus mukurossi*), Shikakai (*Acacia concinna*), Amla fruit (*Embllica officinalis*), Hibiscus leaves (*Hibiscus rosa-sinensis*) with proven efficacy.

The combination of such ingredients has made it possible to secure highly effective dry powder shampoo. The formulation at laboratory scale was evaluated for several organoleptic properties, general powder characteristics and physicochemical evaluation to ensure the safety and efficacy.

INTRODUCTION:

Hairs are an integral part of human beauty. Herbal shampoos are cosmetic preparations that with the use of traditional ayurvedic herbs are meant for cleansing the hair, and scalp, beautifying and managing the hair since the ancient era. Herbal shampoos are used not only for cleansing purposes but also for imparting gloss to hair and maintain their manageability and oiliness for hair.

A shampoo is a hair care product typically, in the form of viscous liquid that is used for cleaning hair to remove dirt, dandruff, pollutants and other contaminant particles that gradually build up in hair. The goal is to remove the unwanted build-up without stripping out so much as to make hair unmanageable.

Hair is one of the external indicators of internal body conditions. Shampooing is the most common form of hair treatment [1 - 3]. For the removal of oil, dirt, environmental pollutants, skin particles, dandruff and other contaminants that gradually grow up in hair, shampoo is used as a cleaning agent and is known as a hair care product being liquid, creamy or gel-like preparations. The main focus is on the removal of contaminants without any stripping of sebum to make hair unmanageable [4]. The consistency of the preparation is based on the inclusion of natural or synthetic fatty alcohols or the thickening agents (e.g. resin, gum, and PEG) and traditional soaps saturated with glycerides. Indian women use natural herbs such as reetha and shikakai that are natural cleansing agents without harmful effects.

1. American journal of pharmatech research

Chavhan V.M . et - al (2019)

- Evaluation and formulation of herbal shampoo.
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- research is required to improve its quality especially on the conditioning performance and to identify the constituents which are responsible for the performance

2. Asian Journal of Pharmaceutical And Reserch

Vijayalaxmi .A et -al (2018)

The present study was carried out with the aim of preparing the herbal shampoo that reduces hair loss during combing, safer than the chemical conditioning agents as well as to strengthen the hair growth.

3. International journal of Science and Research (IJSR)

Gaikwad P.D. et-al (2018)

Formulators must play an active role in educating the consumers about the potential harmful effects of synthetic detergent in shampoos. There is a strong need to change the consumer perceptions of a good shampoo and the onus lies with the formulators.⁴

4. International journal of creative research thought (IJCRT)

Bhagwat S.S et – al (2020)

Use of conditioning agents (synthetic) reduces the protein or hair loss. To provide the effective conditioning effects, the present study involves the use of shikakai, amla, and other plant extracts instead of synthetic cationic conditioners.

MATERIAL AND METHODS :-

The following steps are followed sequentially for the formulation of polyherbal shampoo powder.

- **Drying:-** All the powder are in dry form and grinded.
- **Weighing:-** All the required herbal powders for shampoo preparation were weighed individually.
- **Size reduction:-** The crude ingredients were collected and these ingredients were size reduced using a hand-driven mixer individually.
- **Mixing:-** All these fine ingredients were mixed thoroughly by the mixer to form a homogenous fine powder.
- **Sieving:-** Then this fine powder was passed through sieve no.80, to get a sufficient quantity of fine powder.
- **Packing and labeling:-** Then it was packed and labeled suitably.

EVALUATION OF POLYHERBAL POWDER SHAMPOO:

Prepared formulations of shampoos should be subjected for the following evaluation parameters;

A) Organoleptic evaluation

Organoleptic evaluation on the parameters like colour, odour taste, and texture should be carried out. Colour and texture are evaluated by vision and touch sensation respectively. For taste and odour evaluation a team of five taste and odour sensitive persons are formed and random sampling is performed.

B) General powder characteristic

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. Characteristic 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.

1. Particle size

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

2. 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.

CONCLUSION:

Many people suffer from hair disorders such as dandruff, alopecia, and dermatitis. Shampooing is the best treatment for these types of disorders. The awareness and need for cosmetics with the herb is on the rise, as it is strongly believed that these products are safe and free from side effect. It is seen that many products natural claims are still based extensively on synthetic functional ingredients. The present review focus on the use of the herbal ingredient in place of synthetic ingredient instead of using cationic conditioners we can use shikakai, hibiscus, and other plant extracts to provide a conditioning effect. Herbal based powder shampoos are more effective in terms of safety and ease of manufacturing and from an economic point of view

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

Where, θ – Angle of repose, h – height of the heap,

r – Radius of the base

3.

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.

mass of the polyherbal powder shampoo Bulk density =

Volume of the polyherbal powder shampoo

4.

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/cm^3).

Weight of powder Tapped density =

Tapped volume of powder

C) **Physicochemical evaluation**

1. **PH :-** Measure the pH of 10 % shampoo solution in distilled water at room temperature 25o C. the pH is measured by using adigital pH meter.
2. **Washability :-** Apply the formulation on the skin then checkthe ease andextend of washing with water manually.
3. **Solubility :-** Solubility is defined as the ability of the substanceto solublein a solvent. Weigh 1 gram of the powder accurately and transfer into a beaker containing 100 ml of water. Shake well and warm to increase the solubility. Then cool and filter, and weigh the residue obtained.
4. **Loss of drying: -** Loss of drying is the loss of mass expressedin percent m/m. Weigh Two gram of powder and transfer into a dry Petri dish. Place thePetri 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.

5. **Skin /eye irritation test**

The eye and skin irritation tests reveals that the herbal shampoo powder shows no harmful effect on the skin and eye. This is dueto the absence of synthetic surfactants. Most of the synthetic surfactants produce inflammationof the eyelid and corneal irritation. But in formulation of herbal shampoo powder, all the ingredients used are obtained naturally. So, it does not produce any harmful effect on the skin and eye.

* **Skin irritation test**

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 beforeuse. 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 skinand thus treatable with ease.

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

Step 2 - Dab a small amount of the preparation on the pulse ofyour 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 anyof these signs present themselves, cease use immediately.

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

Eye irritation test

Collect animals (albino rats) from the animal house. Dip about 1

% of shampoo solutions into the eyes of albino rats with their eyesheld open withclips 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.

6. Extractive values

Determination of alcohol-soluble extractive

Weigh 5 g of each air-dried herbal shampoo powder 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 tared 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.

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.

7. Ash value

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.

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 a crucible, wash with hot water, ignite, and weigh.

8. Dirt dispersion

Two drops of 1% of each shampoo powder are added to a large test tube containing 10 ml of distilled water. Add 1 drop of India ink; stopper the test tube and shake for 10 times. The amount of ink in the foam is estimated as None, Light, Moderate, or Heavy.

9. Moisture content determination

Weigh 10 g of each herbal shampoo powder in a tared evaporating dish and keep 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.

10. Wetting time

Cut the canvas into 1-inch diameter discs having an average weight of 0.44

g. Let the disc float on the surface of a shampoo solution of 1 % w/v and then start stopwatch. The time required for the disc to begin to sink is measured accurately and noted as the wetting time.

11. Stability Study

The stability and acceptability of organoleptic properties (odor and color) of formulations during the storage period indicate that they are chemically and physically stable.

12. Nature of hair after washes

Nature of hair after wash should be done by collecting the responses of volunteers.

13. Foaming index

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

$$= 1000/aa = \text{height of the foam}$$