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Preparation and Evaluation of Polyherbal Shampoo Powder

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ABSTRACT

Shampoos are cosmetic preparations that are used to wash hair and scalp, packed in a convenient way for usage. The primary function of the shampoo is to clean the hair, accumulated sebum, scalp debris and residue of hair. A shampoo formulation must be safe and efficient for a long time use .The use of polyherbal cosmetics are raising as they have few side effects. The main objective of our polyherbal shampoo formulation is to eliminate the harmful effects which are caused due to the synthetic shampoos available in the market.The formulated polyherbal shampoo powder consists of Ritha, Neem leaf, Almond, Henna, Rose petals, Chickpea, Vettiver, Hibiscus leaves and flowers. All these materials were collected shade dried and was made into powder. They were mixed together in respective ratios and the following evaluation tests were carried out – Organoleptic characteristics, powder characteristics, physicochemical evaluation, dirt test, foaming capacity, wetting time, etc. As the selected ingredients have been used since long time the present investigation will certainly help in standardization of quality and purity of polyherbal shampoo powder.

KEYWORDS: Polyherbal; shampoo; formulation; evaluation; quality.

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INTRODUCTION

Since the ancient era people use herbs for cleaning, beautifying and to manage hair because hair is considered as the integral part of human beauty[1]. The main constituent of hair is keratin. Keratin is a remarkable protein which is resistant to wear and tear. As years passed by, synthetic agents have taken a dominating role in the formulation industries, but now a days, due to the less expensive and reduced side effects of the natural products people are getting attracted towards natural products because of the harmful effect on the skin, hair and eyes caused by synthetic products[2].

Shampoos are not only used for cleansing hair but also used to maintain the hair – soft, shiny, thicker, longer and to remove the oiliness from the hair. Many types of shampoos are available like powder shampoo, clear liquid shampoo, lotion shampoo, solid gel shampoo, medicated shampoo, liquid herbal shampoo, etc[3,4],. Depending upon the type /nature of ingredients used it may be simple shampoo, anti-dandruff shampoo, anti-septic shampoo and shampoos containing vitamins, amino acids, protein hydrolysate called as nutritional shampoo[5].

MATERIALS AND METHODS

Collection of Plant Material

All the plant materials were collected from the Medicinal Herbal Garden of Sri Ramachandra University, Tamil Nadu and few from the market. These plant materials were shade dried, powdered and stored in air tight containers until it was used for further studies.

Formulation of Powder Shampoo

The formulated shampoo powder is not only safer than the synthetic agent containing shampoos, but it also reduces dandruff, hair fall and makes hair stronger. The above ingredients used also acts as Ritha- antibacterial, antifungal, cleanser, exfoliate, insect repellent, etc., Neem leaf as astringent, antiseptic, antibacterial, antiviral, itching, scabies, boils, swelling and used for head lice infestation. Henna works as a cooling agent and natural dye. Almond as demulcent, nutritive. Rose flower as nourishing & conditioning agent. Hibiscus helps in hair growth. Chickpea helps in darkening hair and vettiver is used as coolant and fragrance[6,7,8,9].

All the ingredients mentioned in Table I were weighed accurately, passed through sieve no 120 and then mixed geometrically[10] and stored in a well closed container for further evaluation.

Table 1: Formulation of powder shampoo

S.No	Ingredients(Common Name)	Ingredients (Biological Name)	Use	Quantity for 100g
1	Ritha fruits	*Sapindus mukorossi*	Detergent	20%
2	Neem leaf	*Azadirachta indica*	Antidandruff	10%
3	Almond	*Prunus amygdalus*	Hair thickener	15%
4	Henna	*Lawsonia inermis*	Nourishing & conditioning	10%
5	Rose flower	*Thymus vulgaris*	Nourishing & conditioning	10%
6	Hibiscus flower	*Hibisucus rosea*	Hair growth	20%
7	Vettiver	*Zizanioides damascena*	Fragrance	10%
8	Channa	*Cicer arietinum*	Darkening	5%

EVALUATION OF SHAMPOO POWDER

1. ***Organoleptic Evaluation:*** The sample was taken randomly and the parameters like colour, odour and texture were carried out manually[11].

2. ***General Powder Characteristics:*** General powder characteristics include evaluation of parameters that affect the external property like flow property, appearance, packaging criteria, etc[12,13].

a) **Particle Size**: The particle size of the powder shampoo was determined by sieving method for 10min.

b) **Angle of Repose**: The flow property of the powder was determined by funnel method; a distance of 2cm was maintained between the graph sheet and the bottom of the funnel, flowing was continued till the top of the heap touches the bottom of the funnel tip.

c) **Bulk Density**: A 100ml graduated cylinder was taken and 5gm of powder was added to the graduated cylinder. This was then kept in the bulk density apparatus and bulk density was calculated .It is expressed in g/cm^3.This is a very important property for packaging and to get uniformity of the product.

d) **Tapped Density:** 5gms of powder was taken and placed in 100ml graduated cylinder and was tapped mechanically for 1 minute and volume was noted until little change in volume was observed. It expressed in g/cm^3.

3. ***Physicochemical Parameter****:*

a) **Ash Value**[14]:

DETERMINATIO OF TOTAL ASH: 5g of powder was taken and placed in tarred silica crucible and kept in a muffle furnace at 450^0C until free from carbon, this was then cooled and the percentage of total ash was calculated.

Determination of Acid Insoluble Ash: The total ash was taken and was boiled for 5minutes with 25ml of dilute Hydrochloric acid and filtered, the insoluble matter that retained over the filter paper was washed with hot water and the acid insoluble ash was calculated.

b) **Moisture Content Determination**: 10g of sample was placed in a tarred evaporating dish and kept in hot air oven for 105^0C. The weight loss was observed at an interval of 15minutes until constant weight was obtained.

c) **pH**: 1g of sample was taken and dissolved in 10ml of water and pH was checked with the help of pH metre.

4. ***Cleaning Action****:* 5g of wool yarn/ cotton ball was taken and placed in grease, the same was then placed in a 200ml of water containing 1g of sample in a bottle, the bottle was shaken for 4minutes. The solution was removed and sample was taken out, dried and weighed. The amount of grease removed was calculated using the formula

Percentage of detergent powder = 100(1-weight of grease in test sample/ weight of grease in control sample)

5. ***Foaming Capacity****:* 2g of shampoo powder was taken in a 250ml graduated cylinder, 50ml of water was added and shaken for 10 times. The total volume of foam contents after 1 minute shaking was recorded at an interval of 5 minutes[15,16].

6. ***Dirt Dispersion:*** 1% of shampoo (1g of sample in 10 ml of water) was taken. 1 drop of methylene blue was added; the test tube was stoppered and shaken for 10 times. The amount of methylene blue in the foam was estimated.

7. ***Wetting Time****:* A canvas was cut into 1 inch diameter discs having a weight of 0.45g. The disc was made to float on the surface of 1% shampoo solution and the time required for the disc to sink was noted as the wetting time.

8. ***Nature of Hair After Wash****:* Nature of hair after wash was done by applying a small quantity of the powder on hair and then washed.

Directions to Apply

- Place required amount of powder in a bowl, add water and make it to a thick paste.

- Gently massage the paste into hair and scalp.
- Wait for 2 to 5 minutes.
- Rinse thoroughly with water.

RESULTS AND DISCUSSION

Organoleptic Evaluation: These parameters were done manually and the results have been tabulated in Table 2.

General Powder Characteristics: The particle size was found to be 20-25µm, Angle of repose was 23°±1.03, Bulk density and Tapped density was found to be 0. 454g/cc and 0.392g/cc respectively.

Table 2: Evaluation of Herbal Powder Shampoo

S.No	Evaluation parameters		Observation
1	Organoleptic evaluation	Colour	Greenish brown
		Odour	Slight
		Taste	Characteristic
		Texture	Fine and smooth
2	General powder Characters	Particle size	20-25µm
		Angle of repose	23°±1.03
		Bulk density	0. 454g/cc
		Tapped density	0.392g/cc
3	Physicochemical Evaluation	Ash value	
		Total ash	4%w/w
		Acid insoluble ash	1.77%w/w
		Moisture content	3.44%
		pH	7±1
4	Cleaning action		32±0.32
5	Foaming		Good foam
6	Dirt dispersion		Moderate
7	Wetting time		2min 14sec
8	Nature of hair after wash		Soft, manageable

Physicochemical Evaluation: The total Ash value and acid insoluble ash value was found to be 4%w/w and 1.77%w/w respectively. The moisture content was 3.44% and the pH of the shampoo was found to be 7±1.

Cleaning action of the formulation was found to be 32±0.32 and the shampoo gave good foam which will be with good compliance. Dirt dispersion capacity of the shampoo was found to be moderate. The shampoo had 2min 14sec of wetting time and the nature of hair after wash was found to be soft and manageable.

CONCLUSION

Our formulation was carried out based on the folklore claims of the herbs used and also to develop few parameters like quality and purity of herbal shampoo. The investigation of polyherbal shampoo powder was carried out for its standardization and shampoo powder.

The evaluation parameters like Organoleptic evaluation, General powder Characters, Physicochemical Evaluation, Cleaning action, foaming, Dirt dispersion, Wetting agent, Nature of hair after wash was carried out and was found to be within the standard range.

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