



Formulation and evaluation of herbal shampoo: A comparative study

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Abstract

The herbal shampoo powder for hair care was prepared using some of the traditional medicines. For organoglytics, powder characteristics, foam examination, and physical assessment, Amla, Reetha, Nagarmotha, Shikakai, and Brahmi were evaluated. According to product selection if the drug is used individually or collectively, existing regulations will help set standards and quality criteria which will definitely help standardize the consistency and purity of these herbal powder shampoos. The entire world is now trying to stick to the pure herbal products by getting no other side effects on ailments. We use made things for our hair and lose their magnificence, quality, strength, volume and shine. Each single manufactured item such as cleanser contains a harmful substance that is responsible for hair damage. Herbal shampoo is the only drug used for hair washing and often used on hair problem hair remedies.

Keywords: herbal shampoo, foam test, quality, herbal powder

1. Introduction

Hair is central to human appearance. People have been using medicinal plants for cleanliness, cosmetics and managing since earlier times. As time has passed, synthetic agents have taken on a greater share, but people are now aware of their adverse effects on the skin and eyes. Such regions have attracted less costly herbal products with marginal side effects. Hair cleaners or shampoos are not only used for cleanliness, but also to polish the hair and to preserve its control and coordination^[1]. Herbal shampoo is defined as a preparation of a surfactant (surface active material) in an appropriate type of liquid solid or power which, when used under the specified conditions, removes surface grease, dirt the skin debris from the hair shaft and scalp without adversely affecting the user's hair, scalp or health.

Herbal formulations are seen as an alternative to synthetic shampoo but it is a challenging task to formulate cosmetics using fully natural raw material^[2]. There are large numbers of medicinal plants which are reported to have beneficial effects on hair and are widely used in shampoo formulation^[3]. These plant products can be used in their powdered form, crude form, distilled extracts, or derivative form^[4]. It is exceedingly difficult to produce a herbal shampoo using a single natural material which will be milder and healthier than the synthetic ones, and at the same time perform favorably with its foaming, detergent and solid content.

Ideal Characteristics of Shampoo^[5].

1. Should effectively and completely remove the dust, excessive sebum.
2. Should effectively wash hair.
3. Should product a good amount of foam
4. The shampoo should be easily removed by rinsing with water.
5. Should leave the hair non-dry, soft, lustrous with good, manageability.

6. Should impart a pleasant fragrance to the hair.
7. Should not make the hand rough and chapped.
8. Should not have any side effects or cause irritation to skin or eye.

Composition of Shampoo^[5].

1. Surfactant
2. Antidandruff agent
3. Conditioning agent
4. Pearlescent agent
5. Sequestrants
6. Thickening agent
7. Colures, perfumes and preservative.

Function of ingredients

1. Amla: Amla It grows on hair and helps with development. It makes the hair retained nature texture and natural oils for a good shine and appearance. It controls loss of hair. It contains fatty acids which humidify the hair. Fatty acids penetrate the skin, reducing dryness and dandruff. This includes antioxidant properties that strengthen the hair roots. It works as a conditioner giving a natural shine and bounce to hair.^[6,7,8]
2. Reetha: It is a washing agent that keeps scalp soft and eliminates any microorganism that is responsible for infection. It also nourishes hair, keeping it safe and smooth. It highlights the hair and gives the color back to nature. it is also helpful for anti dandruff.
3. Shikakai: It preserves nature hair oil, it keeps hair healthy and lustrous. It brings hair on condition and strength. It decreases hair loss, and adds hair volume. It is a potent antidandruff. This produces infectional scalp.
4. Nagarmotha: Stimulates the roots of hairs. It acts on sebaceous gland to facilitate the development of new hairs.

5. Bhringaraj: it retaining the original black hair colour. Rejuvenates the skin.
6. Brahmi: he feeds from hair. It relieves tension, stimulates and relaxes the nerves. It also helps to enhance scalp circulation.
7. Jatamansi: Jattamansi is a small hurdle whose rhizomes will promote hair growth. It improves hair growth due to chemotherapy in alopecia.
8. Ginseng: Ginseng is an age-old natural hair loss remedy for many disorders, including hair loss.
9. Aloevera: It helps thicken hair. It also helps promote hair.
10. Lemon juice: It maintains the pH of Herbal shampoo. It gives a fragrance to herbal shampoo

glass. Flowing is continued until the bottom of the funnel reaches

Materials and Methods

At the verified companies selected herbal drugs in dried form were purchased. Herbs are tabulated in Table 1 along with their portion used in shampoos and the amount taken. [9, 10, 11]

Table 1: Herbal drugs used in powder shampoo formulation F1, F2 and F3

Constituents	F1 (%)	F2 (%)	F3 (%)
Amla	7.25	7.25	7.25
Reetha	5	5	5
Shikakai	4	2	2
Nagarmotha	2	2	2
Bhringaraj	6	5	6
Brahmi	2	2	3
Jatamansi	12	10	12
Ginseng	1.75	1.75	1.75
Aloevera	5	5	5
Lemon juice	1	1	1

Preparation of the herbal shampoo powder

All the powders needed for shampoo preparation were individually measured, passed through sieve no.120 mesh and mixed in ascending order by weight with continuous crushing.^[12] Total three batches of each preparation were labeled and held in a closed container for further studies.

Evaluation of Herbal Shampoo Powder

A. Organoleptic evaluation

Organoleptic evaluation was performed on criteria such as colour, taste, odour, and texture. Color and texture were measured by sensation of vision and touch, respectively. A team of five persons sensitive to taste and odor was created for taste and odor evaluation and random sampling was performed^[1].

B. General powder characteristic

General powder characteristics require assessment of those parameters that will influence the external properties of the preparation (such as flow properties, appearance, packaging requirements, etc.).

a. Particle size is a parameter that could affect various properties such as spreadability, grittiness etc. Particle size was calculated by the method of sieving using I.P. Standard sieves 10 min by mechanical shaking.

b. Angle of repose determines a powder's flow properties. It was calculated by the process of glass funnel method. The distance between the graph paper and the bottom of a powder is held at 2 cm. It had been decided by the funnel of

the top of the heap ^[13].

c. bulk density is an important property for product packaging. A weighted volume of powder was inserted into 100ml graduated cylinder for calculating bulk density. The cylinder is set to the apparatus of bulk density, and the bulk density has been measured ^[14, 15].

d. Tapped density is an increased density of bulk obtained after mechanically tapping a jar containing the sample of powders. After observing the initial volume or mass of the material, the measuring cylinder or vessel will be tapped mechanically for 1 min and volume or mass readings will be taken before no more volume or mass change is observed. It was measured in grams per centimetre cube (g / cm³) ^[12].

C. Physicochemical Evaluation

a. pH: The pH of 10 % shampoo solution was measured at room temperature of 25 ° C in distilled water. Digital pH meter was used to calculate pH.

b. Washability: Formulations were applied to the skin, and then manually tested for ease and degree of washing with water.

c. Solubility: Solubility is known as the substance's capacity to be soluble in a solvent. One gram of the powder is precisely measured and transferred into a beaker that holds 100 ml of water. It was well shaken and warmed to improve the solubility. The residue collected is then cooled and washed, weighed and recorded.

d. Skin irritation test: The skin irritation tests revealed that the herbal shampoo powder shows no harmful effect on skin. This is due to the absence of synthetic surfactants. But in this formulation of herbal shampoo powder, the uses of all ingredients are obtained naturally. So it does not produce any harmful effect on skin.

e. Ash value: About 2 Gm of powder drug was taken in silicon dish previously ignited and weighed. Temperature was increased by gradually increasing the heat not exceeding to red colour. After complete burning, ash is cooled and weighed ^[16].

f. Acid insoluble ash: Acid insoluble ash was calculated by boiling above obtained ash with 25ml dil. HCl for 5min, insoluble matter was collected in gooch crucible, washed with hot water, ignited and weighed ^[16].

g. Dirt Dispersion: In a wide test tube were inserted two drops of 1 % each shampoo powder containing 10 ml of distilled water. Added 1 drop of India ink; the test tube was closed and shaken 10 times. The amount of ink in the foam of None, Light, Moderate, or Heavy was calculated ^[17].

h. Moisture Content Determination: Weighing 10 g of each herbal shampoo powder in a tare evaporating dish, it was placed in a 105⁰ C hot air oven. Repeated the drying until we noticed the constant weight loss after the 30 minute period. For each sample the moisture content has been determined ^[17].

i. Foaming capacity: The foaming capacity of the herbal powder shampoos was measured using a foam stability test with 2 grams of powder in a graduated container with 50 ml of water for different time intervals.

j. Ease of distribution: Ease of distribution was achieved by applying 5ml of the formulation over the wet hair and calculating the time taken to complete the distribution. ¹⁸

k. Ease of rinsing: The time taken to remove the detergent was performed by applying 5 ml of the shampoo and time taken for complete removal of frothing from wash water was determined.

l. Ease of combing (Wet): Ease of combing was performed by passing a comb through the wet hair and checking whether the comb glides smoothly.

m. Ease of Combing (Dry): Ease of combing was performed by passing a comb through the

dry hair and checking whether the comb glides smoothly [18].

Evaluation results of herbal shampoo powder are tabulated as follow:

Results

A. Organoleptic evaluation

Table 2: Organoleptic evaluation parameters and results

Sr. No	Organoleptic evaluation	F1	F2	F3
1	Colour	Greenish brown	Greenish brown	Greenish brown
2	Odour	Slight pleasant	Slight pleasant	Slight pleasant
3	Taste	Characteristics	Characteristics	Characteristics
4	Texture	Fine smooth	Fine smooth	Fine smooth

B. General powder characteristics

Table 3: General powder characteristics and results

Sr. No.	General powder characteristic	F1	F2	F3
1	Particle size	22-25 μ m	21-24 μ m	19-26 μ m
2	Angle of repose	28.680	27.340	26.460
3	Bulk density	0.45gm/ml	0.43 gm/ml	0.47 gm/ml
4	Tapped density	0.57gm/ml	0.53 gm/ml	0.58 gm/ml

C. Physicochemical Evaluation

Table 4: Physicochemical evaluation and results

Sr.No	Physicochemical evaluation	F1	F2	F3
1	PH	5.52	5.41	5.89
2	Washability	Easily washable	Easily washable	Easily washable
3	Solubility	Soluble (sparingly)	Soluble (sparingly)	Soluble (sparingly)
4	Skin / eye irritation	No harmful effect on the skin	No harmful effect on the skin	No harmful effect on the skin
5	Ash value: a) Total ash value	4.42	4.13	4.32
	b) Acid insoluble ash	1.98	1.72	1.81
6	Dirt dispersion	Moderate	Moderate	Moderate
7	Moisture content	3.58%	3.29%	3.53%
8	Foaming capacity	Good foaming (132)	Good foaming (134)	Good foaming (133)
9	Ease of distribution	Better	Better	Better
10	Ease of rinsing	Best	Best	Best
11	Ease of combing (wet)	Better	Better	Better
12	Ease of combing (dry)	Best	Best	Best

Discussion

Three herbal powder formulations F1, F2 and F3 were prepared using Amla, Reetha, Nagarmotha, Shikakai and Brahmi in varying composition (Table-1) of crude drugs. There have been tests on the different quality assurance parameters. All parameter yields favorable outcome. The result obtained from this study shows that when integrated in shampoo, the active ingredients of these drugs offer more stable products with good cosmetic appeal. General powder characteristics were considered almost similar for both formulations. Moisture content for F1, F2 and F3 formulations was found to be 3.58 % w / w, 3.29 % w / w and 3.53 % w / w, respectively. For both formulations the pH has been found to be 5-6 (Table -4). Other tests of the formulation show in Table 4.

Conclusion

Globalization is required today, and herbal medicines contribute to global market beauty, health care, hair preparedness, and hair preparation. This is why we believe that the formulation of powdered herbal shampoo decreases swelling, decreases side effects and improves conditioning. Three shampoo powders are good and all the predicted properties are dependent on humidity time, foam

consistency, dirt and cleanliness. F2 will be more acceptable. Liquid shampoo comes as dry powder No further change in the long store's stability and durability.

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