



## MULTIPURPOSE HERBAL POWDER SHAMPOO

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### ABSTRACT

Aim of the present research work was to formulate multipurpose herbal shampoo powder and comparison with marketed powder shampoo contains many natural ingredients with an emphasis on safety and efficacy, which will avoid the risk posed by chemical ingredients. It clears dirt, dandruff, promote hair growth. strengthens. and darken the hair. moreover, it also act as a conditioning agent and performs all these actions without affecting or damaging hair. The hearb amala, bhringaraj, hibiscus, shkakai, and ginger have been selected to formulate the herbal shampoo powder on the basis of the traditional system and scientific justification with modern use The major objective of the present study was to formulate an herbal shampoo powder by means of eliminating harmful synthetic ingredients and substitute them with natural ingredients. It is very difficult to get all the properties in one substance. Thats why we makes this product unique is that we have made a quality powder shampoo with different properties. Such as anti dandruff, antibacterial, hair growth promoter, conditioner, give smoothen hairs, reduce hair fallor dead skin, etc. The main cause of dandruff is usually a fungus called "Pityrosporum ovale" (P.ovale) which is a naturally occurring yeast - like organism found most on the scalp and other part of the human skin. The fungus is found most on skin areas with plenty of sebaceous glands : on the scalp where large no of sebaceous glands can be found hence chances of dandruff in haire is more as compare to other body part. The reason of hair problem are tension, scalp infection, harmone disturbances, lowers vitamin, food, minerals, and large chemical shampoos are used. To overcome all this problems it was the main aim of our project, so we prepared multipurpose powder herbal shampoo for hair treatment.

**KEYWORDS:** It clears dirt, dandruff, promote hair growth. strengthens.

### INTRODUCTION

Hair -care products may be defined as the preparation which are meant for cleansing, modifying the texture, changing the colour, giving life to the stressed hair, providing nourishment to the hair and giving the healthy look to the hair. The English word shampoo is derived from Hindi word "champion" which means head massage with some form of hair oil. The main aim is shampoo is to remove dirt, oil, skin particals, dandruff, environmental pollutants and other contaminant particals from hair without adversely affecting the users.

Shampoos are most likely utilized as beautifying agents and are a powder preparation of detergent containing various additive, preservative, and active ingredient. It is usually applied on the wet hairs, massaging into the hair, and cleansed by rinsing with water. Alternative to synthetic shampoo we can use shampoo containing natural herbals. However, formulating cosmetic products containing only natural substance are very difficult. There are number of medicinal plants with potential effect on hair used traditionally over years around the

world and are Incorporated in shampoo powder preparation. These medicinal plants used in powder form, crude form.

Hair is one of the external barometer of internal body condition s, It is an important part of human body. Various synthetic compounds, chemicals, dyes, and their derivative have been proved to cause harmful effect. Now a days, people are having an awareness of their effect on hairs skin and eyes. Due to this reasons community is getting attracted towards herbal products dye to their inexpensive nature and negligible side effects. And hence this product having great demand in market.

A shampoo powder is said to be ideal when it (1) effectively and completely remove dust particles and excessive sebum from the scalp and hair, (2) easily remove when rinsed with water, (3) leave the hair non dry, soft and manageable,(4) impart a pleasant fragrance to the hair, (5) couse no side effect or irritation to the skin or hairs. nowadays naturals products dominate over

the synthetic products since it has no side effects. This is one reason that the herbal products are popular among the consumers. Synthetic hair products have chemicals which may give short term growth and shine to hair, but definitely when used for long term damages the hair which may even lead to baldness, premature hair graying and hair loss. Some of the chemicals buses in synthetic shampoo includes sodium directly sulphate, N-nitrosodiethanolamine, EDTA, disodium EDTA, formaldehyde, etc., Hence chances of hair damage are more as compare to herbal powder shampoo.

### Ideal properties of shampoo

Today's shampoo formulations are beyond the stage of pure cleansing of the hair. Additional benefits are expected, e.g. conditioning, smoothing of hair surface, improvement of comb ability and leather creaminess.

1. It should effectively and completely remove dust or soil, excessive sebum or other fatty substances and loose corneal cells from the hair.
2. It should produce a good amount of foam to satisfy the psychological requirements of the user.
3. It should be easily removed on rinsing with water.
4. It should leave the hair non-dry, soft, lustrous with good manageability and minimum fly away.
5. It should impart a pleasant fragrance to the hair.
6. It should not cause any side-effects / irritation to skin or eye.
7. It should not make the hand rough and chapped.
8. To deliver an optimum level of foam to satisfy the expectation of the user.
9. To perform as a vehicle for the deposition of beneficial materials onto the hair and scalp.
10. To be non-damaging to the tissues of the eye if inadvertently splashed.

Based upon the past history:- Indian women use herbals such as shikkakai, reeth and soil that are natural cleansing agents without harmful effects. A shampoo is a preparation of surfactant in a suitable liquid, solid or powder which when used under the specific conditions will remove surface grease, dirt, and skin debris from the hair shaft without adversely affecting the users hairs. "Herbal shampoos 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 pollutions etc. The advantages of this herbal formulation are, it is Pure and organic ingredients, Free from side- effects, No surfactants eg: SLS, No synthetic additives, Good Stability. They are less harmful as compared to commercial shampoos. In the present study, herbal shampoo was formulated containing various types of herbs and suitable ingredients, such as :- Emblica officinalis {hair growth promoter}, Acacia concinna {detergent}, Lawsonia inermis {growth of hair}, tea {dye}, coffee {hair growth promoter}, hibiscus roses {prevent hair loss}, aloe barbadensis {moisturising effect}, brahmi {growth of hair}, Reetha {foaming

agent}, methi powder {nourishment of hair}, ocimum sanctum {antibacterial}, Azadiracta indica {anti dandruff}. Etc.,

## MATERIALS AND METHODS

### Procurement of material

The different parts of the herbs were selected for the study having hair care property. The herbs are methi powder, Neem leaf (Azadirachta indica), Shikakai fruit (Acacia concinna), Aloe leaf (Aloe barbadensis), Henna Leaf (Lawsonia inermis), Brahmi root (Centella asiatica), Ritha fruit (Sapindus mukorossi), Amla fruit (Embelica officinalis), Nagarmotha (Cyperus rotundus), coffee beans (Coffea arabica), Tea leaves (Thea sinensis), orange peel (Cetrus aurantium), Hibiscus leaves and flowers (Hibiscus rosea), methi seeds (Trigonella foenum-graecum), mulani mitti (asbestos clay), Bhringraj leaves (Eclipta prostrata), bavachi flowers (Psoralea corylofolia), ashwagandha (Withania somnifera), and Tulsi. The powder of methi, Amla fruit, Neem leaf, Shikakai fruit, Aloe leaf, Henna Leaf, Ritha fruit, brahmi root, nagrmotha, tulsi leaves, coffee beans, tea leaves, orange peel, hibiscus flowers, bavachi plant, bhringraja, multani mitti, were collected from the local market. The raw materials collected were given with their respective biological source and uses in (table no.1) ingredients in the hair care; even they are responsible to provide the nutrition to the body. Herbs have long been associated with hair care and are often ingredients of conditioners, shampoos and rinses. The selection of active ingredients for hair care powder is often based on the ability of the ingredient to prevent damage to the skin as well as to improve the quality of the skin by way of cleansing, nourishing and protecting the skin. In the paper, we reported the development and evaluation of herbal hair care powder.

**Table 1: Biological source and their uses of herbal ingredients.**

Sr. no	Ingredients	Biological name	Use of ingredients
1	Methi seeds	Dried seeds of <i>Trigonell foenum-graecum</i> (Leguminosae)	Conditioning and nourishment of hair.
2	Ashwagandha powder	Ashwagandha ( <i>Withania somnifera</i> ) is a short woody shrub belonging to the Solanaceae family	Controls Hair Fall, Prevents Premature Greying, Promotes Hair Health.
3	Neem Leaves	Dried leaves of <i>Azadirachta indica</i> (Meliaceae)	Fight scalp infection, prevent the dryness and flaking of hairs, lice, dandruff and itching.
4	Shikakai fruit	Dried pods of <i>Acacia concinna</i> (Mimosaceae)	Foam base and anti-dandruff, to improve hair and skin. and it clears dandruff and the dirt accrued on the scalp
5	Aloe vera leaf	Dried leaves of <i>Aloe barbadensis miller</i> (Asphodelaceae)	Condition and moisturizing effect.
6	Henna Leaves	Dried leaves of <i>Lawsonia inermis</i> (Lythraceae)	Growth of hair, Conditioner.
7	Brahmi root	Dried roots of <i>Centella asiatica</i> (Apiaceae)	Support to growth of Hairs.
8	Reetha fruit	Dried fruits of <i>Sapindus mukorossi</i> (Sapindaceae)	Reetha is a foaming agent
9	Amla fruit	Dried ripe fruits of <i>Emblica officinalis</i> (Euphorbiaceae)	Darkening of hairs and Hair growth promoter.
10	Nagarmotha fruits	Dried ripe fruits of <i>Cyperus rotundus</i> (Cyperaceae)	Scalp disorder
11	Tulsi leaves	Dried leaves of <i>Ocimum sanctum</i> (Lamiaceae)	Antibacterial
12	Coffee seeds	Dried ripe seed of <i>coffea Arabia</i> (rubiaceae)	Natural colorant, dye, provide shine to the hairs
13	Tea leaves	Dried leaves and bud of <i>Thea sinensis</i> (theaceae)	Dye, dead skin removal, provide shine to the hair.
14	Bhringraj leaves	Dried leaves of <i>Ecilipta Alba</i> (Asteraceae)	Hair darkening, hair growth promoter
15	Hibiscus flowers and leaves	Dried leaves and flowers of <i>Hibiscus rosea</i>	Hair conditioner, hair growth promoter, Prevent hair loss.
16	Orange peel	Dried peel of <i>citrus aurantium</i> or <i>citrus dimension</i> (rutaceae)	pH modifier, natural cleanser, anti dandruff
17	Bavachi bark	Dried plant or leaves of <i>psoralea corylifolia</i> (fabaceae)	Provide flavour or aroma, rich source of coumarin
18	Multani mitti	Asbestos clay. Rich source of minerals	Dirt removal, absorbant

**Method of preparation of multipurpose herbal powder shampoo****1:- Drying**

All herbs were collected in dry powder form.

**2:- Weighing**

All the powder herbs were weighed in required quantity as per formula.

**3:- Seiving**

The crude ingredients were collected and these ingredients were size reduced, and sieving to obtain a uniform particle size distribution.

**4:- Mixing**

All powder herbs were mixed in ascending order to get uniform particle size and mixed properly.

**5:- Sieving**

Then this fine powder herbs was passed through sieve no.:120, to get the smooth fine powder formulation.

**Table 2: Formula for multipurpose herbal powder shampoo.**

Sr. No	Ingredients	% quantity
1	Shikakai	30%
2	Amala	10%
3	Methi	2%
4	Ashwagandha	2%
5	Neem	10%
6	Heena	2%
7	Hibiscus	10%
8	Bhringraj	10%
9	Alove	10%
10	Coffee	10%
11	Tea	10%
12	Tulsi	10%
13	Brahmi	20%
14	Reetha	30%
15	Nagarmotha	5%
16	Orange peel	5%
17	Bavchi	5%
18	Mulani mitti	1%

**Marketed formulation:-(kaavery shikkakai powder)**  
**Marketed formulation:- (Kaavery Shikkakai**  
**Ingredients).**

Sr/ no.	Ingredients
1	Acacia concinna
2	Mimosa amara
3	Madhusa longifolia
4	Trigonella foenum-graecum
5	Hibiscus Rosa sinensis
6	Ocimum sanctum
7	Dispersing agents
8	Fillers

### Evaluation of Multipurpose Herbal Powder Shampoo

Prepared formulations of shampoos were subjected to following evaluation parameters.

#### A. Organoleptic evaluation/visual appearance

Organoleptic evaluation for parameters like colour, odour, taste and texture was carried out. Colour and texture was evaluated by vision and touch sensation respectively. For taste and odour evaluation a team of five taste and odour sensitive persons were selected.

#### B. General powder characteristics

General powder characteristics includes 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 particle size, angle of repose, bulk density and tapped density. All the three shampoo powders were taken at three different level i.e. from top, middle and lower level for the evaluation.

##### 1. Particle size

Particle size is a parameter, which affect various properties like spreadability, grittiness etc., particle size was determined by 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 pile of powder to the horizontal flow.

##### Funnel method

Required quantity of dried powder is taken in a funnel placed at a height of 6 cm from a horizontal base. The powder was allowed to flow to form a heap over the paper on the horizontal plane. The height and radius of the powder was noted and recorded the angle of repose ( $\theta$ ) can be calculated by using the formula.

##### Open - ended cylinder method

Required amount of dried powder is placed in a cylindrical tube open at both ends is placed on a horizontal surface. Then the funnel should be raised to form a heap. The height and radius of the heap is noted and recorded. For the above two methods, the angle of repose ( $\theta$ ) can be calculated by using the formula.  $\theta = \tan$

$-1(h / r)$  Where,  $\theta$  – Angle of repose, h – Height of the heap, r – Radius of the base of the base of the heap

#### 3. Bulk density

Bulk Density is the ratio between the given mass of a powder and its bulk volume. Required amount of the powder is dried and filled in a 50 ml measuring cylinder up to 50 ml mark. Then the cylinder is dropped onto a hard wood surface from a height of 1 inch at 2 second intervals. The volume of the powder is measured. Then the powder is weighed.

This is repeated to get average values. The Bulk Density is calculated by using the below given formula.

$$\text{Bulk density} = \frac{\text{Mass of the herbal powder shampoo}}{\text{Volume of the herbal powder shampoo}}$$

#### 4. Tapped density

The tapped density is an increased bulk density attained after mechanically tapping a container containing the powder sample. After observing the initial powder volume or mass, the measuring cylinder or vessel is mechanically tapped for 1 min and volume or mass readings are taken until little further volume or mass change was observed. It was expressed in grams per cubic centimeter ( $\text{g}/\text{cm}^3$ ).

$$\text{Tapped Density} = \frac{\text{Weight of powder}}{\text{Tapped volume of powder}}$$

#### C. Physicochemical evaluation

##### 1. pH

The pH of 10% shampoo solution in distilled water was determined at room temperature  $25^\circ\text{C}$ . The pH was measured by using digital pH Meter.

##### 2. Washability

Formulations were applied on the skin and then ease and extent of washing with water were checked manually.

##### 3. Solubility

Solubility is defined as the ability of the substance to soluble in a solvent. One gram of the powder is weighed accurately and transferred into a beaker containing 100 ml of water. This was shaken well and warmed to increase the solubility. Then cooled and filter it, the residue obtained is weighed and noted.

##### 4. Loss on drying

Loss on drying is the loss of mass expressed in percent m/m. Two gram of the powder was weighed accurately and transferred into a dry Petri dish.

The Petri dish is placed in a dessicator for 2 days over calcium chloride crystals. Then the powder was taken and weighed accurately to find out the weight loss during drying.

### 5. Skin /eye irritation test

The eye and skin irritation tests revealed that the herbal shampoo powder shows no harmful effect on skin and eye. This is due to the absence of synthetic surfactants. Most of the synthetic surfactants produce inflammation of the eyelid and corneal irritation. 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 and eye.

#### Skin irritation test

Skin irritation test is carried out by using open patch method.

With many cosmetic products, whether commercial or homemade, it is recommended that you do a patch test on your skin prior to use. This is to ensure that you do not have an allergic reaction to the product and if you do, 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 a period of 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 have a reaction. If you do not have any allergic reaction symptoms, it is likely that the preparation is all right for your skin type.

#### Eye irritation test

Animals (albino rats) were collected from animal house. About 1% shampoo solutions was dripped into the eyes of albino rats with their eyes held open with clips at the lid. The progressive damage to the rat's eyes was recorded 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

5 g of the each air dried herbal shampoo powder was weighed and macerated with 100 ml of Alcohol of the specified strength in a closed flask for twenty-four hours, shaken frequently during six hours and allowed to stand for eighteen hours. Filtered, by taking precautions against loss of solvent, 25 ml of the filtrate was evaporated to dryness in a tare flat bottomed shallow dish, and dry at 105 °C, to constant weight and weighed. The percentage of alcohol-soluble extractive with reference to the air-dried drug was 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 is characteristic for a herb. 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.

#### Acid insoluble ash

Acid insoluble ash was calculated by boiling above obtained ash with 25 ml dil. Hcl for 5min, insoluble matter was collected in gooch crucible, washed with hot water, ignited and weighed.

### 8. Dirt dispersion

Two drops of 1% each shampoo powders were added in a large test tube contain 10 ml of distilled water. 1 drop of India ink was added; the test tube was stoppered and shaken for 10 times. The amount of ink in the foam of was estimated as None, Light, Moderate, or Heavy.

### 9. Moisture content determination

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

### 10. Wetting time

The canvas was cut into 1 inch diameter discs having an average weight of 0.44 g. The disc was floated on the surface of shampoo solution of 1% w/v and the stopwatch started. The time required for the disc to begin to sink was measured acutely and noted as the wetting time.

### 11. Stability Study

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

### 12. Nature of hair after washes

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

### 13. Foaming index

One gram of the powder was weighed accurately and transferred into 250 ml conical flask containing 100 ml of boiling water. Then it is warmed gently for 30 minutes, cooled and filtered and make up the volume to 100 ml in standard volumetric flask. This extract is taken in 10 test tubes in a series of successive portion of 1, 2,

3....10 ml and remaining volume is made up with water to 10 ml. Then the test tubes were shaken in longwise motion for 15 seconds at speed of 2 frequencies / second. Then the tubes are allowed to stand for 15 minutes. The height of the foam was measured. Foaming index =1000/a

## RESULTS AND DISCUSSION

Prepared multipurpose herbal shampoo powder (M1) & simultaneously compared with marketed shampoo (M2)  
A) Organoleptic properties.

**Table 3: Organoleptic evaluation/visual appearance.**

Sr. No	Test	Observation (M1)	Observation (M2)
1	Colour	Light Brown	Light green
2	Odour	Characteristic	Characteristic
3	Texture	Fine or smooth	Very fine or smooth
4	Test	Slight	Slight



**IMG 1:- multipurpose herbal shampoo powder.**



**IMG 2: Marketed powder shampoo (kaavery).**

### B) General powder characteristics

**Table 4: General powder characteristics of herbal powder and marketed powder.**

Sr. No	Test	Result (M1)	Result (M2)
1	Partical size	22-25um	20-25um
2	Angle of repose	33"5°	34"55°
3	Bulk density	0.2804g/cm3	0.2893g/cm3
4	Tapped density	0.56g/cm3	0.58g/cm3

## C) Angle of repose

Table 5: Angle of Repose calculation of herbal powder and marketed powder.

Sr. No.	Method	Height of the cone (h in cm)	Radius of the cone (r in cm)	TAN $\theta$ = (H/R)	Average $\tan\theta$ =	$\theta = \tan^{-1}(h/r)$	Flow property
1 Prepared powder shampoo	Funnel method	3.5 cm	5.2cm	0.6730	0.6821	33°5'	Good flow property
		3.3cm	4.9cm	0.6734			
		3.5 cm	5.0cm	0.7			
2 Marketed powder shampoo	Funnel method	3.3cm	4.55cm	0.7252	0.6886	34°55'	Good flow property
		3.4cm	4.9cm	0.6938			
		3.3cm	5.1cm	0.6470			

## D) Bulk density

Table 6: Bulk density calculation of herbal powder and marketed powder.

Sr. No.	Bulk volume in (ml)	Mass of powder (gm)	Bulk density (gm/ml)	Average bulk density (gm/ml)
1.herbal powder	74	20	0.270g/cm <sup>3</sup>	0.2804g/cm <sup>3</sup>
	72	20	0.277g/cm <sup>3</sup>	
	68	20	0.294g/cm <sup>3</sup>	
2. Marketed powder	68	20	0.294g/cm <sup>3</sup>	0.2893g/cm <sup>3</sup>
	70	20	0.285g/cm <sup>3</sup>	
	69	20	0.289g/cm <sup>3</sup>	

## E) Tapped density

Table 7: Tapped density calculation of herbal powder and marketed powder.

Sr. No.	Tapped volume (ml)	Mass of powder (gm)	Tapped density(gm/ml)	Average tapped density (gm/cm <sup>3</sup> )
1.Herbal powder	37	20	0.54 g/cm <sup>3</sup>	0.56 g/cm <sup>3</sup>
	35	20	0.57 g/cm <sup>3</sup>	
	34	20	0.58 g/cm <sup>3</sup>	
2.Marked powder	34	20	0.58 g/cm <sup>3</sup>	0.58 g/cm <sup>3</sup>
	35	20	0.57 g/cm <sup>3</sup>	
	33	20	0.60 g/cm <sup>3</sup>	

## F) Physicochemical properties

Table 8: Physicochemical Property of herbal shampoo and marketed shampoo.

Sr. No.	Physicochemical evaluation	Herbal shampoo (M1)	Marketed shampoo (M2)
1	PH	5.48	5.46
2	Washability	Easily washable	Easily washable
3	Solubility	Soluble	Soluble
4	Skin irritation	No har full effect on skin	No dharm full effect on skin
5	Foaming capacity	Good foaming	Good foaming
6	Extractive value		
	Alcohol soluble	3.44gm remain	3.21gm remain
	Water soluble	0.46 remain	0.42 remain
7	Ash value		
	Total ash content	2.37% w/w	2.01% w/w
	Acid insoluble ash	1.02% w/w	0.97% w/w
8	Dirt dispersion	Moderate	Moderate
9	Moisture content determination	8.77 gm remain out of 10 gm	9.01 gm remain out of 10 gm
10	Wetting time	8.52 sec	6.46sec
11	Stability	Stable at room temp	Stable at room temp
12	Nature of hair after wash	Soft manageable	Soft manageable

1. Extractive value- alcohol solubility
2. Water solubility.



### 5. Washability of powder shampoo





6. Determination of alcohol soluble extractive
7. (1) Dirt dispersion of powder shampoo and 2) dirt dispersion of marketed shampoo.
- 8) Foaming ability of multipurpose herbal powder shampoo (M1)



**9) Foaming ability of marketed shampoo (M2)****10) Skin irritation test**

1: 1. Before applying the shampoo 2. Powder shampoo apply. 3. After 15 min. 4. After 20 min.

9) Skin irritation test -In this open patch method herbal powder shampoo is apply to the skin and observe their effect, they should not produce any side effect to the skin. They should not produce redness, a rash, any form ofkouts on the skin, itchiness, pain, flaking etc.

**11) Alcohol solubility test**

11) Alcohol soluble test - remaining test sample or marketed sample

## G) Foaming index

Table 9: Foaming index calculation for herbal powder and marketed powder.

Sr no	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
Test sample	2.5	2.3	2.1	2.6	2.0	2.3	2.4	2.5	2.1	2.6
Marketed sample	2.8	3.0	2.9	2.7	.4	2.5	2.4	2.7	2.6	2.1

Note: T1 - T10 Test tube numbers 1 to 10  
foaming index =  $1000/a = 1000/9 = 111.1\%$

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2	Ashwagandha powder	Ashwagandha (Withania somnifera) is a short woody shrub belonging to the Solanaceae family	Controls Hair Fall, Prevents Premature Greying, Promotes Hair Health.
3	Neem Leaves	Dried leaves of Azadirachta indica (Meliaceae)	Fight scalp infection, prevent the dryness and flaking of hairs, lice, dandruff and itching.
4	Shikakai fruit	Dried pods of Acacia concinna (Mimosaceae)	Foam base and anti-dandruff, to improve hair and skin. and it clears dandruff and the dirt accrued on the scalp
5	Aloe vera leaf	Dried leaves of Aloe barbadensis miller (Asphodelaceae)	Condition and moisturizing effect.
6	Henna Leaves	Dried leaves of Lawsonia inermis (Lythraceae)	Growth of hair, Conditioner.
7	Brahmi root	Dried roots of Centella asiatica (Apiaceae)	Support to growth of Hairs.
8	Reetha fruit	Dried fruits of Sapindus mukorossi (Sapindaceae)	Reetha is a foaming agent
9	Amla fruit	Dried ripe fruits of Emblica officinalis (Euphorbiaceae)	Darkening of hairs and Hair growth promoter.
10	Nagarmotha fruits	Dried ripe fruits of Cyperus rotundus (Cyperaceae)	Scalp disorder
11	Tulsi leaves	Dried leaves of Ocimum sanctum (Lamiaceae)	Antibacterial
12	Coffee seeds	Dried ripe seed of Coffea Arabica (Rubiaceae)	Natural colorant, dye, provide shine to the hairs
13	Tea leaves	Dried leaves and bud of Thea sinensis (Theaceae)	Dye, dead skin removal, provide shine to the hair.
14	Bhringraj leaves	Dried leaves of Eclipta Alba (Asteraceae)	Hair darkening, hair growth promoter
15	Hibiscus flowers and leaves	Dried leaves and flowers of Hibiscus rosea	Hair conditioner, hair growth promoter, Prevent hair loss.
16	Orange peel	Dried peel of Citrus aurantium or Citrus limonum (Rutaceae)	pH modifier, natural cleanser, anti dandruff
17	Bavachi bark	Dried plant or leaves of Psoralea corylifolia (Fabaceae)	Provide flavour or aroma, rich source of coumarin
18	Multani mitti	Asbestos clay. Rich source of minerals	Dirt removal, absorbant

**Table 2: Formula for multipurpose herbal powder shampoo.**

Sr. No	Ingredients	% Quantity
1	Shikakai	30%
2	Amala	10%
3	Methi	2%
4	Ashwgandha	2%
5	Neem	10%
6	Heena	2%
7	Hibiscus	10%
8	Bhringraj	10%
9	Alove	10%
10	Coffee	10%
11	Tea	10%
12	Tulsi	10%
13	Bramhi	20%
14	Reetha	30%
15	Nagarmotha	5%
16	Orange peel	5%
17	Bavchi	5%
18	Mulani mitti	1%

**Table 03: Marketed formulation :- (kaavery shikkakai powder) Marketed formulation :- (Kaavery Shikkakai Ingredients).**

Sr no.	Ingredients
1	Acacia concinna
2	Mimosa amara
3	Madhusa longifolia
4	Trigonella foenum-graecum
5	Hibiscus Rosa sinensis
6	Ocimum sanctum
7	Dispersing agents
8	Fillers

**Table 4: Organoleptic evaluation/visual appearance.**

Sr. No	Test	Observation (M1)	Observation (M2)
1	Colour	Light Brown	Light green
2	Odour	Characteristic	Characteristic
3	Texture	Fine or smooth	Very fine or smooth
4	Test	Slight	Slight

**Table 5: General powder characteristics of herbal powder and marketed powder.**

Sr. No	Test	Result (M1)	Result (M2)
1	Partical size	22-25um	20-25um
2	Angle of repose	33°5'	34°55'
3	Bulk density	0.2804g/cm <sup>3</sup>	0.2893g/cm <sup>3</sup>
4	Tapped density	0.56g/cm <sup>3</sup>	0.58g/cm <sup>3</sup>

**Table 6: Angle of Repose calculation of herbal powder and marketed powder.**

Sr. No.	Method	Height of the cone (h in cm)	Radius of the cone (r in cm)	TAN $\theta$ = (H/R)	$\tan\theta$ =	$\theta = \tan^{-1}(h/r)$	Flow property
1 Prepared powder shampoo	Funnel method	3.5 cm	5.2cm	0.6730	0.6821	33°5'	Good flow
		3.3cm	4.9cm	0.6734			
		3.5 cm	5.0cm	0.7			
2Marketed powder shampoo	Funnel method	3.3cm	4.55cm	0.7252	0.6886	34°55'	Good flow
		3.4cm	4.9cm	0.6938			
		3.3cm	5.1cm	0.6470			

**Table 6: Bulk density calculation of herbal powder and marketed powder.**

Sr. No	Bulk volume in (ml)	Mass of powder (gm)	Bulk density (gm/ml)	Average bulk density (gm/ml)
1.Herbal powder	74	20	0.270g/cm <sup>3</sup>	0.2804g/cm <sup>3</sup>
	72	20	0.277g/cm <sup>3</sup>	
	68	20	0.294g/cm <sup>3</sup>	
2. Marketed powder	68	20	0.294g/cm <sup>3</sup>	0.2893g/cm <sup>3</sup>
	70	20	0.285g/cm <sup>3</sup>	
	69	20	0.289g/cm <sup>3</sup>	

**Table 7: Tapped density calculation of herbal powder and marketed powder.**

Sr. No.	Tapped volume (ml)	Mass of powder(gm)	Tapped density(gm/ml)	Average tapped density (gm/cm <sup>3</sup> )
1.Herbal powder	37	20	0.54 g/cm <sup>3</sup>	0.56 g/cm <sup>3</sup>
	35	20	0.57 g/cm <sup>3</sup>	
	34	20	0.58 g/cm <sup>3</sup>	
2.Marked powder	34	20	0.58 g/cm <sup>3</sup>	0.58 g/cm <sup>3</sup>
	35	20	0.57 g/cm <sup>3</sup>	
	33	20	0.60 g/cm <sup>3</sup>	

**Table 8: Physicochemical Property of herbal shampoo and marketed shampoo.**

Sr. No	Physicochemical evaluation	Herbal shampoo (M1)	Marketed shampoo (M2)
1	PH	5.48	5.46
2	Washability	Easily washable	Easily washable
3	Solubility	Soluble	Soluble
4	Skin irritation	No skin irritation	No skin irritation
5	Foaming capacity	Good foaming	Good foaming
6	<b>Extractive value</b>		
	Alcohol soluble	3.44gm remain	3.21gm remain
	Water soluble	0.46 remain	0.42 remain
7	<b>Ash value</b>		
	Total ash content	2.37% w/w	2.01%w/w
	Acid insoluble ash	1.02% w/w	0.97%w/w
8	Dirt dispersion	Moderate	Moderate
9	Moisture content determination	8.77 gm remain out of 10 gm	9.01 gm
9	Moisture content determination	8.77 gm remain out of 10 gm	9.01 gm remain out of 10 gm
10	Wetting time	8.52 sec	6.46sec
11	Stability	Stable at room temp	Stable at room temp
12	Nature of hair after wash	Soft manageable	Soft manageable

**Table 9: Foaming index calculation for herbal powder.and marketed powder.**

Sr. no	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
Test sample	2.5	2.3	2.1	2.6	2.0	2.3	2.4	2.5	2.1	2.6
Marketed sample	2.8	3.0	2.9	2.7	.4	2.5	2.4	2.7	2.6	2.1

Note: T1 - T10 Test tube numbers 1 to 10 foaming index =  $1000/a = 1000/9 = 111.1\%$



Multipurpose herbal shampoo powder



Marketed powder shampoo (kaavery)

1. Extractive value .-  
a) alcohol solubility  
b) water solubility



2. Water solubility



3. total ash content



<p>4. wetting time</p>	
<p>5. determination of alcohol soluble extractive</p>	 <p>6) Washability of powder shampoo</p>
<p>7) Foming ability of herbal powder shampoo (M1 AND M2)</p>	

8) Dirt dispersion of powder shampoo And Marketed formulation	 Two graduated cylinders are shown side-by-side. The left cylinder contains a white powder at the bottom and a clear liquid above it. The right cylinder contains a white powder at the bottom and a clear liquid above it, with some white residue visible on the inner wall of the cylinder.
9) Skin irritation test	 Four photographs of human skin are arranged in a 2x2 grid, labeled 1 through 4. Photograph 1 shows a smooth, unblemished skin surface. Photograph 2 shows a skin surface with a yellowish, powdery substance applied to it. Photograph 3 shows a skin surface with a yellowish, powdery substance applied to it, and a small red mark is visible. Photograph 4 shows a skin surface with a yellowish, powdery substance applied to it, and a small red mark is visible.
10) Alcohol solubility test	 Two photographs of white filter paper are shown side-by-side. The left filter paper has a brown, powdery substance on it. The right filter paper has a brown, powdery substance on it, and a small amount of the substance has dissolved into the liquid on the paper.

### SUMMARY AND CONCLUSION

A survey of global hair care market trends indicates that consumer use of herbal products has significant increased over the past years. The factors like UV radiations, use of harsh chemical products have direct and indirect impact on the hair. To overcome this problems the present study has the best undertaken to design a herbal shampoo which will not only give hair protection but also conditioning effect, shine and manageability. The upresent work focuses on the

potential of herbal extracts from cosmetic purposes. Hence we conclude that the formulation of polyherbal shampoo powder is effective in reducing dandruff without irritation, less adverse effect and better conditioning effect. 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. Nowadays there is strong demand for natural therapies, and this is increasing in western countries. The

herbs which are a cheapest of phytoconstituents are on wheals to attain their role in polyherbal formulation so as to have synergistic role. Hence we concluded that the polyherbal formulation of Shampoo is effective in reducing dandruff without irritation, less adverse effect and better conditioning effect. The awareness and need for cosmetics with herbs in on the rise, as it is strongly believed that these products are safe and free from side effects. For the treatment of dandruff we have both synthetic and natural herbal shampoos. But when compared to the chemical based shampoos, herbal based shampoos are more effective in terms of safety and ease of manufacturing and in the economic point of view they are cheap.

The crude herbs was collected and prepared herbal powderd shampoo and various evolution test was perform by comparing with marketed powderd shampoo. both marketed and prepared powder shampoo results was obtained satisfactory

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