

FORMULATION AND EVALUATION OF POLYHERBAL ANTIDANDRUFF POWDER SHAMPOO

Sachin Gholve^{1*}, Sachin Nadarge¹, Sunil Hindole¹, Omprakash Bhusnure¹,
Pratap Bhosale² and Sanjay Thonte¹

¹Channabasweshwar Pharmacy College (Degree), Kava Road, Basweshwar Chowk, Latur,
Maharashtra, India-413512

²Channabasweshwar Pharmacy Polytechnic Kava Road, Basweshwar Chowk, Latur,
Maharashtra, India-413512.

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***Correspondence for
Author**

Sachin Gholve

Channabasweshwar
Pharmacy College
(Degree), Kava Road,
Basweshwar Chowk,
Latur, Maharashtra, India-
413512.

ABSTRACT

Day by day dependency of people is rising on herbal or ayurvedic formulation not only for chronic ailments but also for number of acute problems. The assurance of therapy with minimal side effects has been proven that ayurvedic formulation is to be promising for cosmetic use too. In the scenario of changing food habits, stress level and dependent environment conditions, number of skin and hair disorders are encountered. Maintenance of other factor shall not fulfill the need so extraneous treatment is essential that to which is safe. In case of hair disorders like dandruff problem, proper selection of ayurvedic ingredient with their required amounts, dosage form can be formulated as powder shampoo to fight against dandruff. This herbal shampoo was formulated using natural ingredient like *fenugreek* (methi), *Azadirachta indica* (neem), *Acacia concinna* (shikakai), *Sapindus*

mukorossi (reetha), *Ocimum sanctum* (tulsi) with proven efficacy of hair care preparation is prepared. The combination of several such ingredient of herbal origin has made it possible to secure highly effective dry powder shampoo. The formulation at laboratory scale was done and evaluated for number of parameters to ensure its safety and efficacy.

KEYWORDS: Hair, Dandruff, Powder Shampoo, Herbal material, Methi seed, Antidandruff shampoo.

1. INTRODUCTION

Harry defined shampoo as a preparation of a surfactant i.e. surface active material in a suitable form liquid, solid, powder. But the usage of surface active material becomes very harmful from long time for the youth as well as our environment. Various synthetic compounds, chemicals, dye and their derivative has been proved to cause various skin diseases having numerous side effects. The word herbal is a symbol of safety in contrast to the synthetic one which has adverse effects on human health. Thus there is increasing attractiveness of herbal cosmetics and the tremendous range of herbal products now generally available to the public. "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. Exposure to harmful chemicals is kept to a minimum and as for the all natural one there is no exposure to harmful chemicals at all. They are a stepping stone to buying organic products. Most customers, after getting unsatisfactory results with commercial shampoos, begin their journey with natural shampoos and when they find them satisfactory but want more, move on to organic shampoos.

There are many ingredients found in organic shampoos that are also found in natural shampoos like Vitamin E, Aloe Vera and Soy protein and they provide the same benefits to natural shampoo users as organic shampoo users. Natural Shampoos stimulate the growth of new hair by having a combination of organic and natural ingredients which stimulate the hair follicles while keeping the environment around the follicles clear and balanced.

Longer lasting Hair, by minimizing toxin exposure to the hair, the hair stays healthy, long and damage free. Then there is formulate a new advanced herbal antidandruff shampoo. Before the formulating this shampoo they collect information about Hair, Dandruff, and Shampoo.

Hair

In humans it is a special and cherished feature, especially in females, but its main functions are in protection of the skin from mechanical insults and to facilitate home therapy^[1,2], eyebrows and eyelashes, for example, stop things entering the eyes, while scalp hair prevents sunlight, cold, and physical damage to the head and neck.^[3] It also has a sensory function,

increasing the perception of the skin surface for tactile stimuli, and sub serves important roles in sexual and social communication, considering the psychological impact on quality of life seen in hair disorders, such as hir sutism, hair loss, etc.^[3,4] In particular, regarding this last point, a significantly higher prevalence of personality disorders in subjects with androgenetic alopecia regarding the prevalence of such diagnoses in the general population have been reported.^[5]

Anatomy and Physiology of the Hair

Structure of Hair

A hair is composed of columns of dead, keratinized cells welded together. The shaft is a superficial portion of the hair, which projects from the surface of the skin. The shaft of straight hair is rounded in cross section, that of wavy hair is oval and that of wooly hair is elliptical or kidney shaped. The root is the portion of the hair deep into the surface that penetrates into the dermis and sometimes into the subcutaneous layer. The shaft and root both consist of three concentric layers-

- **Medulla**

It is the central part of the shaft and is generally noticeable in thick hair. It is composed of two or three rows of polyhedral cells containing pigment granules and air spaces.

- **Cortex**

It is located peripheral to the medulla and forms the major part of the shaft. It consists of elongated cells, containing pigment granules in dark hair while air in white hair.

- **Cuticle**

It is the outermost layer of the hair and consists of a single layer of thin, flat cells, which are heavily keratinized.

Physiology of the hair

A hair arises from the integrated activities of several keratinocyte layers in the hair follicle. The development of hair is a dynamic, cyclic process in which the duration of growth cycles is coordinated by many hormones and cytokines and depends not only on where the hair is growing but also on some other factors, such as the individual's age and stage of development, nutritional habits, or environmental alterations like day-length.^[6] Important players of this cycle are mainly cytokines (hormones), which are able to instruct the follicle

to undergo appropriate changes, so that each hair can be in a different stage of growth cycle compared to the adjacent hairs.^[7-8] Hair follicles grow in repeated cycles, in which stages of rapid growth and hair shaft formation alternate with stages of apoptosis-driven hair follicle regression and relative hair follicle quiescence.^[9,10] In particular, the hair growth cycle can be divided into three distinct phases

- 1) Anagen or growth phase;
- 2) Catagen or transitional phase; and
- 3) Telogen or resting phase.

The anagen phase is an active growth phase, during which the hair follicle enlarges reaching its characteristic onion shape and a hair fiber is produced. It can be divided into six stages (I–VI). During anagen I–V (proanagen), hair progenitor cells proliferate, envelope the growing dermal papilla, grow downwards into the skin, and begin to differentiate into the hair shaft and IRS; then, the newly formed hair shaft begins to develop and the melanocytes located in the hair matrix show pigment producing activity; in anagen VI (metanagen), full restoration of the hair fiber-producing unit is realized, which is characterized by formation of the epithelial hair bulb surrounding the dermal papilla, located deep in the subcutaneous tissue, and the new hair shaft appears from the skin surface. This phase can last for several years in hair follicles.^[3,11]

Dandruff

The relationship between dandruff and seborrhea dermatitis has at times been controversial. While most investigators regard seborrhea dermatitis of the scalp as severe dandruff, others believe that dandruff should be used to describe any flaking of the scalp.^[12,13] A normal scalp has few flakes and healthy looking, smooth skin. Dandruff is clinical condition caused by *Malassezia* (*Pityrosporum*) species is of great cosmetic concern all over the world. *Pityrosporum ovale* is strongly suspected to play a role in the manifestation of the seborrhea dermatitis. Dandruff is known to be controlled by fungistatic ingredients in Anti-dandruff shampoos. herbal formulation have growing demand in the world market. The natural remedies are more acceptable in market because it's safe and fewer side effect antidandruff shampoo and nutritional shampoo containing vitamin, amino acids proteins hydrolysate. Currently available treatment of dandruff include therapeutic use of zinc pyrithione, salicylic acid, imidazole derivatives, glycolic acid, steroids, and sulphur and coal tar derivatives. However, these agents show certain limitations, either due to poor clinical efficacy or due to

the. Furthermore compliance issues, these drugs are unable to prevent recurrence. The herbal shampoo powder was formulated using natural ingredients with *Acacia concinna* (shikakai), *Lawsoniainermis* (henna), *Aloevera* (aloe), *Ocimum sanctum* (Tulsi), *Azadiracta indica* (Neem), and *Fenugreek* (methi). Both are having antidandruff action. The synthetic shampoo contain cationic, anionic and non anionic surfactant mix in this surfactant having good foaming character but its toxic and caused irritation of eye. Hard water the surfactants leave a deposit of sodium, calcium and magnesium salts on the hair shaft. So these synthetic shampoos are found to have side effects like drying effect on the hair. These shampoos leave the hair too dry to handle (or) comb, to avoid these problems, herbal shampoos will be useful.

Shampoo

Hair is an important part of the overall appeal of the human body. The hair of the head has historically been associated with beauty and social distinction. Innumerable instances from all the art forms can be cited supporting the special prominence accorded to the hair by people of virtually all times and cultures. Whereas the hair has been trimmed, shaped and even colored since the most ancient times, relatively little emphasis has been placed on the process of cleaning it. Only in this century has a real technology in the cleaning of the hair and scalp been developed. First came the mass distribution of cake soap and sanitary facilities to make bodily cleanliness and personal hygiene practice. Next came the specialization of branded shampoo products for the hair and scalp, offered in multiplicity of types and forms. Now, washing the hair and scalp with shampoo has become a nearly universal practice. Shampoos are probably the most widely used hair products today, based on synthetic ingredients as well as herbal ingredients.

A shampoo is a preparation of a surfactant (i.e. surface active material) in a suitable form – liquid, 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.

Herbal Shampoo

“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.

Ideal properties of shampoos

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.

MATERIALS AND METHODS

Procurement of material

The different parts of the plants were selected for the study having hair care property. The plants 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*) and Tulsi. The powder of methi, Amla fruit, Neem leaf, Shikakai fruit, Aloe leaf, Henna Leaf, Ritha fruit 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 no.1:- Biological source and their uses of herbal ingredients.

Sr.No	Ingredient	Biological name	Use of ingredient
1	Methi powder	Dried seeds of <i>Trigonella 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	Dried ripe fruits of <i>Cyperus rotundus</i> (Cyperaceae)	Scalp disorder
11	Tulsi	Dried leaves of <i>Ocimum sanctum</i> (Lamiaceae)	Antibacterial

Method of preparation**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 hand driven mixer individually.

Mixing

All these fine ingredients were mixed thoroughly by mixer to form a homogenous fine powder.

Sieving

Then this fine powder was passed through sieve no.:120 , to get the sufficient quantity of fine powder.

Table- 2:- Formula for herbal antidandruff powder shampoo.

Sr.no.	Ingredient	Quantity (for 100 gm)
1	Methi powder	10 gm
2	Aswagandha powder	10 gm
3	Neem leaves	05 gm
4	Shikakai fruits	10 gm
5	Aloe vera leaves	10 gm
6	Brahmi powder	10 gm
7	Henna leaves	05 gm
8	Reetha fruit	10 gm
9	Amla fruit	10 gm
10	Nagarmotha	10 gm
11	Tulsi	10 gm

EVALUATION OF HERBAL POWDER SHAMPOO^[15, 17-21]

Prepared formulations of shampoos were subjected to following evaluation parameters.

A. Organoleptic evaluation/visual appearance^[15,17]

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^[14-16]

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^[18]

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^[19]

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 (θ) 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 (θ) can be calculated by using the formula.

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

θ – Angle of repose, h – Height of the heap, r – Radius of the base of th

3. Bulk density^[18,19]

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^[20,21]

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 (g/cm³).

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

C. Physicochemical evaluation

1. pH

The pH of 10% shampoo solution in distilled water was determined at room temperature 25°C. The pH was measured by using digital pH Meter.^[17]

2. Washability

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

3. Solubility^[15]

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 ^[15]

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 ^[15,17]***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 ^[17]

Acid insoluble ash was calculated by boiling above obtained ash with 25 ml dil. Hcl for 5 min, 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 105⁰c. 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 ^[17]

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 ^[15]

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 ^[15,17]

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

2. RESULTS**Table no.3:- Organoleptic evaluation/visual appearance.**

Sr. no	Test	Observation
1	Colour	Faint brownish
2	Odour	Characteristic
3	Texture	Fine and smooth
4	Taste	slight

Table no.4:- General powder characteristics.

Sr. no	Test	Result
1	Particle size	20-25 μm
2	Angle of repose	33°4'
3	Bulk density	0.4656 g/cm^3
4	Tapped density	0.612 g/cm^3

Table no.5:- Angle of Repose calculation of herbal 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	Funnel method	3.7	5.6	0.6607	0.6810	33° 4'	Good flow property
		3.9	5.4	0.7222			
		3.5	5.3	0.6603			

Table no.6:- Bulk density calculation of herbal powder.

Sr.no.	Bulk volume (ml)	Mass of the powder (gm)	Bulk density gm/ml	Average bulk density gm/ml
1	100	46.56	0.4656 g/cm^3	0.4656 g/cm^3
2	100	46.55	0.4655 g/cm^3	
3	100	46.57	0.4657 g/cm^3	

Table no.7:- Tapped density calculation of herbal powder.

Sr.no.	Tapped density (ml)	Mass of the powder (gm)	Tapped density gm/ml	Average tapped density gm/ml
1	76	46.56	0.612 g/cm ³	0.612 g/cm ³
2	76	46.56	0.612 g/cm ³	

Table no.8:- Foaming index calculation for herbal powder.

T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
0.8	0.7	0.7	0.9	0.5	0.6	0.9	0.8	1	0.8

Note: T1 - T10 Test tube numbers 1 to 10

foaming index = 1000/a

$$= 1000/9 = 111.1\%$$

Skin irritation test



Fig 1: 1. Before applying the shampoo

2. Powder shampoo apply. 3. After 15 min. 4. After 20 min.

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 of breakouts on the skin, itchiness, pain, flaking etc.

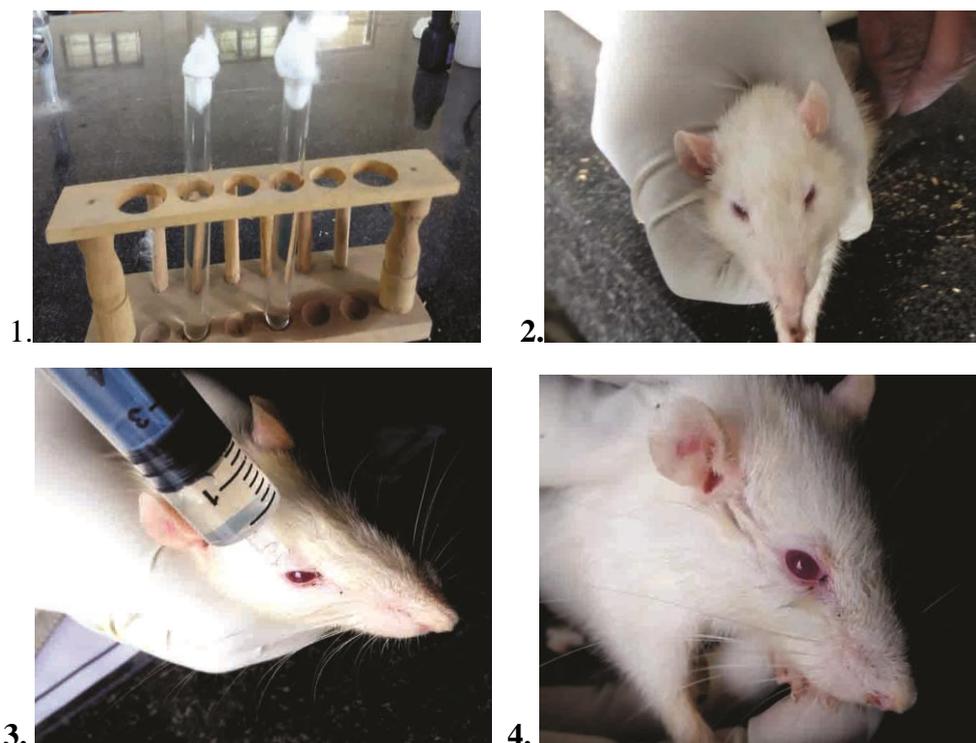
Eye irritation test

Fig 2: 1. Sample 2. Before applying sample 3. Apply sample 4. After 10 sec.

In this herbal formulation 1% dilution is apply to the albino rat eye then there is no irritation occure, like a swelling of the eyelid, inflammation of the iris, ulceration, hemorrhaging (bleeding) and blindness. So, this herbal powder shampoo are non toxic or no side effect to the skin, or eye.

Table no.9:- Physicochemical Property of shampoo.

Sr. no.	Physic-chemical evaluation	Result
1	pH	5.49
2	Washability	Easily washable
3	Solubility	Soluble (water)
4	Skin /eye irritation	No harmful effect on skin or eye
5	Foaming capacity	Good foaming
6	Extractive values	
	Alcohol soluble	16 % w/w
	Water solubility	12 % w/w
7	Ash value	
	Total ash content	4.88 % w/w
	Acid insoluble ash	1.57 % w/w
8	Dirt dispersion	Moderate
9	Moisture content determination	5.01 %
10	Wetting time	170 ± 0.04
11	Stability	Stable
12	Nature of hair after washes	Soft manageable

3. DISCUSSION

Medicinal plants used in the formulation of herbal shampoo were found as rich source of novel drugs. These plants were Methi, Henna, Reetha, Tulsi, Neem, Amla, Shikakai, Ashwagandha, Aloe, Brahmi had been reported for hair growth and conditioning. The various quality control parameters were checked. All parameter gives favorable result. The result obtained on present study shows that the active ingredients of these drugs when incorporated in shampoo gives more stable products with good aesthetic appeal. The pH of the shampoo has been shown to be important for improving and enhancing the qualities of hair, minimizing the irritation to the eyes and stabilizing the ecological balance of the scalp. The current trend to promote shampoos of lower pH is one of the minimizing damage to the hair. Such results are estimated out of a formulation to establish strong results for the usage and good results of the product. Though the product is in dry form inspite has wonderful wetting capacity and being dry is very good for the storage. 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.

4. 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 present 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 wheels to attain their role in polyherbal formulation so as to have synergistic role. Hence we conclude 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.

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