International Journal of Phytopharmacy **Research Article**
ISSN: 2277-2928 (Online)
Journal DOI: https://doi.org/10.7439/ijpp

Development and standardization parameters of dry shampoo incorporating medicinal plant powders

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Abstract

Shampoos are used not only for cleansing purposes but also for imparting gloss to hair and to maintain their manageability. Shampoos come in various types, including powder shampoo, liquid shampoo, lotion shampoo, cream shampoo, jelly shampoo, aerosol shampoo, baby shampoo, specialized shampoo, medicated shampoo, conditioning shampoo and, liquid herbal shampoo. As far as herbal shampoos are concerned, in terms of stability criteria, depending on the nature of the ingredients, they may be plain shampoo, antiseptic, antidandruff, or anti-hair fall. In the present work, the herbal shampoo powder has been developed, by using traditional drugs for hair care. The preparation was formulated using ***Amla, Ashoka, Bhringraj,*** and evaluated for organoleptic properties, powder characteristics, foam test evaluation and physical evaluation. The physico-chemical evaluation of the formulated shampoo showed ideal results. The preparations were formulated & evaluated for organoleptic, powder characteristics, foam test, physical evaluation, and stability studies. As the selected drugs have been used since long time as single drug or in combination, present investigation will further help to establish a standard formulation and evaluation parameters, which will enhance the standardization for quality and purity of dry powder shampoo. Herbal Shampoo is used for cleansing of the hair, conditioning, smoothening of the hair surface, good health of hair, making hair free of dandruff, dirt, grease above all, its safety benefits were studied. The advantage of herbal cosmetic is their non- toxic nature, reduce the allergic reaction.

Keywords: Dry Shampoo, Physico- chemical Evaluation, Standardization Parameters.

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***Article History:**
Received: 06/7/2025
Revised: 05/08/2025
Accepted: 09/08/2025
DOI: https://doi.org/10.7439/ijpp.v15i1.5858

QR Code

How to cite: Kamlesh K., Manisha T. and Pratyush J. Development and standardization parameters of dry shampoo incorporating medicinal plant powders. *International Journal of Phytopharmacy* 2025; 15(1): e5858. Doi: 10.7439/ijpp.v15i1.5858 Available from: https://ssjournals.co.in/index.php/ijpp/article/view/5858

1. Introduction

Hair is an integral part of human beauty. Hair is responsible for the looks of a person. They indicate the prakriti of a person. They can change the overall appeal, makeover of an individual [1-2]. People have been using herbs for cleaning, beautifying and managing hair since the ancient era. As the time has passed synthetic agents have taken a large proportion, but today people are aware of their harmful effects on hair, skin and eyes. This has increased attention towards the medicinal plant products, which are less expensive and have a few side effects [3-5]. Hair cleansers or shampoos are used not only for cleansing purpose but also for imparting gloss to hair and to maintain their manageability and provide sheen to the hair.[1]Shampoos are of various types, like powder shampoo, clear liquid shampoo, lotion shampoo, gel shampoo, medicated shampoo, liquid herbal shampoo etc [6-7]. As far as herbal shampoos are concerned in stability criteria, depending upon the nature of the ingredients they may be simple or plain shampoo, antiseptic, antidandruff shampoo, nutritional shampoo containing vitamin, amino acids, protein hydrolysate [8-10]. Hair is one of the vital parts of the body derived from ectoderm of the skin and is protective appendage of the body and considered accessory

structure of the integument along with sebaceous glands, sweat glands and nails [11-13]. They are also known as epidermal derivatives as they originate from the epidermis during embryological development [14-16]. Hair is an important part of the overall appeal of an individual. Hair is one of the external indicators of internal body conditions. Shampooing is the most common form of hair cleansing. The primary function of shampoo is to cleanse hair of the accumulated sebum, dust, scalp debris etc [17]. Various shampoo formulations are associated with hair quality, hair care habits and specific problems such as treatment of oily hair, dandruff and for androgenic alopecia [18]. Shampoos are liquid, creamy or gel like preparations. The consistency of the preparation depends on the inclusion of traditional soaps saturated with glycerides and natural or synthetic fatty alcohols or the thickening agents (e.g. gum, resin and PEG). Indian women used herbals such as *Shikkakai* and *Reetha* that are natural cleansing agents with less harmful effects [19]. Shampooing is the most common form of hair cleansing. Various shampoo formulations are associated with hair quality, hair care habits and specific problems such a treatment of oily hairs, dandruff and for androgenic alopecia [20]. A shampoo is a preparation of a surfactant in a suitable form-liquid, solid or powder which when used for the specific conditions will remove surface grease, dirt and skin debris from the hair shaft without adversely affecting the user. The most important functions of the shampoo are to cleanse the dirt, sebum and harmful environmental irritants present in the environment [21]. They help to open the pores on the surface of the scalp beneath which are the hair follicles. They also help to reduce dandruff causing fungus from the scalp. They help in adding glow to the hair, smoothness, reduce itchiness, manage pH of the scalp.

1.1 Ideal characters of shampoo are

- Effective and complete cleansing of the dust and excessive sebum.
- Effectively wash hair.
- Produce a good lather.

The shampoo must be easily removed by rinsing with water imparting the hair a soft, lustrous look with good manageability. Impart a pleasant fragrance to the hair. Produce less side effects like irritation to skin and eye.

1.2 Shampoo ingredients:

- Surfactant
- Antidandruff agents
- Conditioning agents
- Pearlescent Agents
- Sequestrants
- Thickening agents
- Colours
- Perfumes
- Preservatives

1.3 Types of Shampoo

Shampoos are of the following types:

1. Powder Shampoo.
2. Liquid Shampoo.
3. Lotion Shampoo.
4. Cream Shampoo.
5. Jelly Shampoo.
6. Aerosol Shampoo.
7. Specialized Shampoo.
8. Conditioning Shampoo.
9. Anti-dandruff Shampoo.
10. Baby Shampoo.
11. Two Layer Shampoo.

1.4 The problems of hair:

Falling of hair, Greying of hair, Dandruff, and Split end hair etc. The causes of hair problem are tension, scalp infection, hormonal imbalance, lower vitamin, minerals, and excessive use of chemical shampoos. To overcomes all these problems were the main intention of our project. So, a dry shampoo, incorporating ***Amla, Bhringraj, Ashoka*** bark was formulated for hair cleansing. Cleanliness of hair and scalp are among the most important personal life consideration to day.

2. Material and methods:

2.1 Preparation of Ingredients:

Amla

Figure 1: Amla Fruits

Amla trees are highly adaptable, thriving in diverse climates, from subtropical to semi-dried regions, and are resistant to saline and alkaline soils. They are often found in tropical and subtropical forests and can survive in both dry and moist conditions. Amla is highly valued for its vitamin C content and antioxidants. The fruit is traditionally used in Ayurvedic medicine for various purposes, including improving immunity, digestion, and skin health. Vitamin C: Amla is one of the richest natural

sources of Vitamin C, which provides strong antioxidant properties and boosts the immune system.

Tannins: Compounds like emblicannin A and B, punigluconin, and pedunculagin have potent antioxidant properties, helping to stabilize vitamin C content.

Polyphenols: Includes flavonoids such as quercetin and kaempferol, which have anti-inflammatory and antioxidant effects.

Gallic Acid and **Ellagic Acid**: These phenolic acids exhibit anti-inflammatory, anti-microbial and anti-cancer activities.

Alkaloids and Glycosides: Minor constituents that contribute to various pharmacological actions.

Phyllantin and Zeatin: Known for promoting wound healing and other medicinal properties. It acts as an Antioxidant, Anti- inflammatory, Immunomodulatory, Antimicrobial, Hepatoprotective, Anti-diabetic, Cardioprotective.

Ashoka

Figure 2: Ashoka Tree

Ashoka (*Saraca asoca*) is primarily distributed in South and Southeast Asia, India**.** ***Ashoka*** is native to India and is widely found in the Himalayan foothills and tropical forests of the Indian subcontinent**.** It grows in forests and temples, where it is often planted as a sacred tree due to its cultural and religious significance. It is mostly common in states like Uttar Pradesh**,** Madhya Pradesh**,** Himachal Pradesh**,** and Tamil Nadu**.** ***Ashoka*** is a medium-sized evergreen tree**,** typically growing to a height of 8–10 meters but can reach up to 15 meters in some cases.

Habit: It has a dense**,** rounded canopy and is known for its aesthetic and medicinal qualities.

Ashoka is highly regarded in Ayurveda for treating gynaecological disorders, particularly menstrual problems, excessive bleeding, and uterine health. The bark, leaves, and flowers are used in various forms (powder, decoction, paste) for treating conditions like irregular menstruation, painful periods, and postpartum care. It also has properties that help in digestive health, anti-inflammatory action and anti-anxiety benefits.

Ashoka contains a variety of bioactive compounds that contribute to its therapeutic effects such as

Tannins: They have astringent, anti-inflammatory, and antioxidant properties.

Flavonoids: Such as quercetin, which possess antioxidant, anti-inflammatory, and antimicrobial actions.

Saponins: They have anti-inflammatory and immunomodulatory properties.

Alkaloids: Contribute to analgesic and anti-inflammatory activities.

Steroids: Steroidal compounds like β-sitosterol help in reducing inflammation and promote overall health.

Coumarins: These compounds possess antioxidant and anti- inflammatory effects.

Glycosides: Support heart function and lowering blood pressure. ***Ashoka*** is widely used in the treatment of female reproductive health disorders, Anti-inflammatory, Antioxidant, Antibacterial and Antimicrobial.

Bhringraj

Figure 3: Bhringraj

Bhringraj (*Eclipta prostrata* or *Eclipta alba*) is widely distributed across tropical and subtropical regions, particularly in Asia, Africa, and America. India and South Asia: ***Bhringraj*** is commonly found throughout India, particularly in the warm, humid regions.

It grows abundantly in Himalayan foothills, plains, and tropical forests. It thrives in areas with plenty of sunlight, moisture, and fertile soil, including road sides, fields, and wastelands. ***Bhringraj*** thrives in tropical and subtropical regions and is typically found in moist areas such as road sides, fields, and in wetlands. It grows best in sunny locations with well- drained soils and high humidity.

Distribution: Commonly found in India, Southeast Asia, parts of Africa, and increasingly in South and Central America.

Chemical Constituents: Contributing to Medicinal Properties) consists of-

Alkaloids: Ecliptin and Stigmasterol.
Triterpenoids: Including beta-sitosterol.
Flavonoids: Apigenin and Luteolin.
Sesquiterpenes: Anti-inflammatory and antimicrobial effects.
Coumarins and Glycosides: Contribute to its medicinal properties.

2.2 Preparation of Dry Shampoo Powder:

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

1. **Drying:** All the ingredients were dried.
2. **Weighing:** All the required powders for shampoo preparation were weighed individually.
3. **Size reduction:** Crude Drugs were size reduced using a hand-driven Ball Mill individually.
4. **Mixing:** All these ingredients were mixed thoroughly by the mortar pestle to form a homogenous fine powder.
5. **Sieving:** Then the fine powder was passed through sieve no.80 to get a sufficient quantity of fine powder.
6. **Packing and labelling:** Then it was packed and labelled suitably.

2.3 Evaluation of dry shampoo:

Organoleptic evaluation:

Organoleptic evaluation includes the parameters like colour, odour, taste and texture. Colour and texture are evaluated by vision and touch sensation respectively. For taste and odour evaluation, a team of five taste and odour sensitive people was formed and random sampling was performed.

General powder Characteristics:

General powder characteristics include evaluation of parameters which include flow properties, appearance, packaging criteria, etc.

Formulation Characteristics evaluated were powder form, particle size, angle of repose, and bulk density, tapped density. Samples for all these evaluations were taken at three different levels i.e. from the top, middle and lower levels.

Particle Size:

Particle size is a parameter, which could affect various properties like spreadability, grittiness, etc. Particle size was determined using sieving method I.P. Standard sieves were used for mechanical shaking for10 minutes.

Angle of repose:

It is defined as the maximum angle possible between the top of the pile of powder to the horizontal plane surface.

Funnel method:

Required quantity of dried powder was 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 surface. The height and radius of the powder heap was noted and recorded the angle of repose (θ). The angle of repose was calculated using the formula mentioned in textbook.

Bulk Density:

Bulk density is the ratio between the given mass of a powder and its bulk volume. Weighed the required amount of dried powder and filled it into a 50ml measuring cylinder up to 50 ml mark. Then dropped the cylinder onto a hard surface from a height of 1 inch at a 2-second interval. Measured the volume of the powder. Then weighed the powder. This process was repeated to get average values. The bulk density was calculated.

Tapped density

The tapped density was obtained after mechanical tapping a container containing the powder. Observed the initial powder volume or mass, tapped the measuring cylinder or vessel mechanically for 1min and taken volume or mass readings until little further volume or mass change was observed.

2.4 Physicochemical evaluation:

pH:

Measured the pH of 10 % shampoo solution in distilled water at 37°C temperature. The pH was measured using a digital pH meter.

Washability:

Applied the formulation on the skin then checked the ease and extent of washing with water manually.

Solubility:

Solubility is defined as the ability of the solvent to dissolve a particular amount of solute to form a solution. Weighed 1 gram of the powder accurately and transferred it into a beaker containing 100 ml of water. Shaken well and warmed to increase the solubility. Then cooled and filtered, and weighed the residue obtained.

Loss on drying:

Loss on drying is the loss in mass of water expressed in percent gm/gm. Weighed two grams of powder and transferred it into a dried Petridish. Placed the Petridish in a desiccator for 2 days over calcium chloride. Then, taken the powder and weighed accurately to find out the reduction in weight during drying.

Skin/Eye Irritation Test:

The eye and skin irritation tests revealed that the herbal shampoo powder produced no harmful effect on the skin and eye. This was due to the absence of synthetic surfactants. Most of the synthetic surfactants produce inflammation of the eyelid and corneal irritation. But in formulation of herbal shampoo powder, all the ingredients utilized were obtained naturally. So, it can be considered safe for use.

Skin Irritation Test:

Performed skin irritation test using the patch method. With many cosmetic products, whether commercial or homemade, it is recommended to perform a patch test on skin before use. This was done to ensure that no allergic reaction was seen for the product and if so, it would only be confined to a small area of skin and thus treatable with ease.

Ash value:

The residue left after incineration (complete burning) of the crude drug is considered as Ash Value. The residue obtained generally represents the inorganic salts naturally occurring in the drug and adhering to it. It varies with in definite limits according to the soil. It may also include inorganic matter intentionally added for the purpose of adulteration. Hence, an ash value determination furnishes the basis for deciding the identity and cleanliness of any drug and gives information relative to its adulteration/contamination with inorganic matter, thus ash values are helpful in concluding the quality and purity of drug. The total ash of a crude drug shows the care taken in its preparation. The acid-insoluble ash is a part of the total ash that is insoluble in dilute hydrochloric acid. A high value of acid-insoluble ash denotes high presence of silica and calcium oxalate content in the drug.

Total Ash Value:

Accurately weighed about 3 grams of air-dried drug powder in a tared silica crucible. Noted the weight of empty silica crucible and placed it along with weighed quantity of drug in to muffle furnace for incineration. Gradually increased the temperature of muffle furnace up to 450-500° C and kept the crucible in a muffle furnace until all the carbon was burnt off. Cooled and weighed ash after complete incineration, repeated weighing until a constant value was obtained. Then, the percentage of total ash was calculated with reference to the air-dried drug.

Acid insoluble ash value:

The ash obtained as from the procedure of total ash was boiled with 25 ml of dil hydrochloric acid for 5 minutes. After boiling the solution was filtered using an ash less filter paper. The insoluble matter remained on the ash less filter paper, washed it with hot water. Dried the filter paper, incinerated it. Then, removed it from incinerator and cooled it in a desiccator. Weighed the silica crucible. Then , calculated the percentage of acid-insoluble ash with reference to the air-dried drug.

Water soluble ash Value:

The total ash obtained was boiled with 25 ml of water for 5 minutes. The insoluble matter was collected on an ash less filter paper, washed with hot water and ignited for 15 minutes at a temperature not exceeding 450° C. The weight of insoluble matter was subtracted from the weight of total ash. The difference in weight represents the water-soluble ash. The percentage of water-soluble ash was calculated with reference to the air-dried drug.

2.5 Sensory Evaluation of Herbal Shampoo

To evaluate the appearance, color, odor, consistency, and foam quality of herbal shampoo using a sensory evaluation.

Procedure

For Appearance and Color: Poured 5 ml of shampoo into a clear glass beaker and observed under natural light on a white background. And finally, noted the presence of particles or clarity and Color (pale yellow, greenish, brownish, etc.).

For Odor (Fragrance): Smell the shampoo directly from the beaker. Recorded pleasant smell or fragrance intensity on a scale of 1–5.

Ease of Application: Applied a small quantity on wet hair or artificial hair strands. Observed lathering, spreadability and ease of rinsing.

2.6 Oil Absorption Efficiency of Herbal Shampoo:

To evaluate the oil removal (absorption)

Efficiency of herbal shampoo using artificially oiled hair as a substrate. The method assesses the ability of the shampoo to remove oil from hair, indicating cleansing efficiency. The difference in hair weight before oiling, after oiling, and after dry shampooing was used to calculate % oil removal efficiency.

Procedure:

Pre-weighing: Taken dry, clean hair strands (~5 g). Weighed accurately and recorded as W_1 (weight before oiling).

Oiling: Applied 0.5 g of oil per gram of hair to the hair strands. Rubbed gently to ensure uniform distribution. Allowed the hair sample to stand for 30 minutes for oil absorption.

Weight after oiling: Wiped off excess surface oil gently using filter paper. Weighed the oiled hair and recorded as W_2 (weight after oiling).

Shampoo Washing: Taken 1 g of shampoo per gram of hair. Applied the shampoo on the oiled hair. Massaged gently for 3 minutes.

Weighing: Weighed the hair again and recorded as W_3 (weight after dry shampooing).

Calculation:

Calculated

% Oil Removed using formula:

$$\% \text{ Oil Removed} = (W2-W3/W2-W1) \times 100$$

Residue Visibility of Herbal Shampoo:

To evaluate the presence of visible residue on hair after application of dry herbal shampoo, assessing the removal and residue-free nature of the formulation. After dry shampooing insoluble ingredients may leave visible residues on hair. This method involves visual inspection under standardized conditions to detect and grade residue visibility.

Procedure

Pre-cleaning of hair: Washed the hair strands thoroughly with distilled water to remove any pre-existing contaminants. Allowed them to dry at room temperature.

Shampoo Washing:

Taken oiled or clean hair as required for formulation testing. Applied 1 g of shampoo per gram of hair, adding 10 ml of distilled water. Massaged for 3–5 minutes for actual hair washing. Rinsed thoroughly with lukewarm distilled water until foam was completely removed.

Drying: Allowed hair strands to air dry at room temperature. Alternatively, used a hair dryer on low heat, ensuring no residue was blown away.

Visual Inspection: Spread hair on a white background under bright light. Observed for visible residues, flakes, or particles with the naked eye.

Used a magnifying glass/stereomicroscope if needed for detailed inspection.

2.7 Stability and Shelf-life:

To determine the stability and shelf-life of the prepared dry herbal shampoo under different storage conditions by evaluating physical, chemical, and microbiological parameters over time. The stability study demonstrated the ability of the herbal shampoo to maintain its quality, safety, and efficacy under storage conditions for a specified period, indicating shelf-life. Both accelerated and real-time stability studies were used.

Method

Prepared three sets of shampoo samples for Accelerated conditions: 40°C ± 2°C, 75% RH ± 5% RH, for Refrigerated conditions: 4°C ± 2°C and for Room temperature: 25°C ± 2°C. Observations were recorded at time intervals of Initial (0 months), 15 days, 30 days, 60days and 90 days (or longer for real-time studies up to 12 months).

Physical Parameters such as Color, Odor, Appearance (clarity, phase separation, precipitation), consistency, and volume, chemical parameters and microbial parameters were evaluated.

Procedure for Testing Colour, Odor, Appearance: Visually inspected under daylight.

pH: Used 1% shampoo solution in distilled water and measured using a calibrated pH meter.

Viscosity: It was measured using a Brookfield viscometer or using a simple flow test.

3. Result and Discussion

3.1 Evaluation of Herbal Shampoo

Organoleptic evaluation:

A dry herbal shampoo containing ***Amla, Bhringraj, and Ashoka*** is effective for cleansing the scalp, reducing oiliness, and promoting scalp health, especially when formulated with proper particle size and low moisture content.

It is a natural, eco-friendly alternative to conventional dry shampoos and supports Ayurvedic principles of hair care. This pH is scalp-friendly ideal pH: 4.5–5.5 which protects against microbes. Avoids alkalinity that can remove natural oils or cause irritation. Minimal residue remains if a soft brush or towel is used for removal. Scalp feels clean and refreshed, without drying effect seen in chemical shampoos. The shampoo is made from natural plant powders (Amla, Bhringraj, Ashoka), which contain tannins, alkaloids, glycosides which are water-soluble. Cellulose and lignin are insoluble in both water and oil. Therefore, it behaves like a suspension in water—not a true solution. It swells and disperses, allowing beneficial components to act on the scalp. A LOD ≤ 6% means the powder is dry enough to prevent microbial growth. If LOD is >7%, there's a risk of spoilage or clumping - drying or reformulation may be needed.

Stored in airtight containers to prevent moisture absorption. A value within 5–7% is typical for high-quality herbal powders. Ash >9% may indicate contamination with inorganic impurities like sand or excess minerals. An acid-insoluble ash value ≤1.5% indicates low levels of siliceous contaminants and good cleaning/sieving during processing.

Water Soluble Ash value indicated presence of soluble minerals like potassium, magnesium, and trace elements. A value too low may suggest adulteration or poor-quality plant material.

A higher-than-expected value might indicate excess mineral salts or non-herbal additives.

Table 1: Composition of Herbal dry shampoo powder:

S. No.	Ingredients	Quantity (100gm)
1.	*Bhringraj* herb	20 gm
2.	*Amla* fruit	20 gm
3.	*Ashoka* bark	20 gm

Table 2: Organoleptic evaluation

Organoleptic evaluation	Result
Colour	Greyish brown
Odour	Pleasant
Taste	Characteristic Astringent
Texture	Fine, smooth

3.2 General Powder Characteristics:

Table 3: General powder characteristics

Powder Characteristics	Result
Particle Size	25-30 micrometer
Angle of repose	34°9’
Bulk density	0.354
Tapped density	0.55

3.3 Physico-chemical evaluation:

Table 4: Physico-chemical characteristics

Test	Result
pH	4.8
Washability	Very good
Solubility in distilled water	Partially soluble
Solubility in Ethanol (95%)	Insoluble
Solubility in pH5.5 Water	Partially soluble
Solubility in Coconut Oil	Insoluble
Loss on Drying	4.8%
Total Ash value	6.2%
Acid-insoluble ash value	0.78%
Water-soluble ash value	2.7%

Table 5: Results of Sensory Evaluation of Herbal Shampoo:

Parameters	Observation/Score
Appearance	Fine uniform powder
Colour	Greyish brown
Odour	4 (pleasant)

Table 6: Results of Oil Absorption Efficiency:

Observation	Value(g)
Weight before oiling (W_1)	5.00
Weight after oiling (W_2)	7.50
Weight after applying dry shampoo (W_3)	5.50
%Oil Removed	80 %

Table 7: Results of Residue Visibility of Herbal Shampoo

Parameters	Observation/Score
Residue Visibility	Score 0 (None)
Comb test	Clean
Mean Residue score	Negligible

Table 8: Results of Stability and Shelf-life Evaluation of Herbal Shampoo:

Parameters	Initial	15 Days	30 Days	60 Days	90 Days
Color	Greyish brown	Same	Same	Same	Slightly dark
Odor	Aromatic	Same	Same	Same	Same
Appearance	Clear, no particles	Same	Same	Slight turbidity	Slight turbidity
pH	6.5	6.4	6.3	6.3	6.2
Microbial growth	Absent	Absent	Absent	Absent	Absent

4. Conclusion

Medicinal plants used in the formulation of Herbal shampoo were found as rich source of novel constituents. The various quality control parameters were checked. All parameters gave favorable results. The result obtained from present study showed that the active ingredients of these drugs when incorporated in shampoo produced 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 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 ways of minimizing damages to the hair. Such results are estimated for a formulation to establish strong results for the usage and good results of the product. Though the product is in dry form and being dry, is suitable for storage. The evaluation parameters like Organoleptic evaluation, General Powder Characters, Physico-chemical Evaluation, cleansing action was carried out and was found to be within the standard range. The present work focussed on the use of the medicinal plants in place of synthetic ingredients. Herbal based powder shampoos are more effective in terms of safety and ease of manufacturing and from an economic point of view.

Acknowledgement

Presenting Author is thankful to the management of Sarvepalli Radhakrishnan University, RKDF College of Pharmacy, Bhopal, Madhya Pradesh, India for providing the facilities to conduct the research work.

The constant inspiration being provided from by the Chairman of the University, Chancellor Mrs Janak Kapoor Madam, Vice Chancellor and CEO Madam, Vice CEO Sir, Registrar Sir, Pro-Chancellor, Dean Research and Development, for enlightenment of the path of Research and Development.

Authors are also thankful to Dr. Mrs Manisha Tandon for her consistent support and guidance throughout the project work.

Authors also acknowledge the efforts being shown by the staff of Sarvepalli Radhakrishnan University, Bhopal, Dr. Prashant Soni, Dr. Pratyush Jain, Dr Pathak Kailash, Dr. Sharma Rishikesh specially Mrs. Ketkee Mandawar, Mrs. Seema Sahu, Mr Praveen Kumar, Mr Supyar Singh, Dr. Yogesh Shivhare.

References

[1]. Hasrat JA, Pieters L, De Baker JP, Vauquelin G, Vlietinck J. Screening of medicinal plants from Suriname for 5-HT1A ligands: bioactive isoquinoline alkaloids from fruits of *Annona muricata*. *Phytomed.* 4, 1997b 133–140

[2]. Pendbhaje NS, Narang AP, Pathan SM, Raotole SA, Pattewar SV. Ethnopharmacology, pharmacognosy and Phytochemical profile of *Allium sativum*: A review. *Pharmacologyonline.*, 2011, (2):845-853

[3]. Ranjani R, Raju MA. Anticancer properties of *Allium sativum* – A review. *Asian J Biochem PharmaceuticRes.* 2012,3(2):190-196

[4]. Cardelle-Cobas A, Soria AC, Corzo-Martinez M, Villamiel M. A comprehensive survey of garlic functionality. Nova Science Publishers, Inc, 2010: 1-60

[5]. Kemer KJ, MD, MPH. Garlic (*Allium sativum*). The Longwood Herbal Task Force, www.longwoodherbal.org/garlic/garlic.pdf.March 8, 2000

[6]. Kirtikar KR, Basu BD. Indian medicinal plants. International Book Distributors, Dehradun, 2nd ed.,1935, Vol.IV:2513- 2515.

[7]. Lardos A, Kreuter MH. Garlic. R & D Department, Flachsmann A G, Zurich,1-8.

[8]. Pimple BP, Patel AN, Kadam PV, Patil MJ. Microscopic evaluation and physicochemical analysis of *Origanum majorana* Linn leaves. *Asian Pac J Trop Dis.*2012:1-6.

[9]. Zaid H, Rayan A, Said O, Saad B. Cancer treatment by Greco Araband Islamic herbal medicine. *The Open Nutraceutical J.*3,2010:203-212.

[10]. Kadam PV, Yadav KN, Deoda RS, Navasare VS, Shivatare RS, Patil MJ. Pharmacognostical evaluation of root of *Alpinia galanga* Willd. *Int J Pharm.* 2012, 2(2):426-431.

[11]. Kadam PV, Yadav KN, Patel AN, Navasare VS, Bhilwade SK, Patil MJ. Phytopharmacopoeial specifications of *Garcinia indica* fruit rind. *Phcog J.* 4(31), 2012: 23-28.

[12]. Kadam PV, Yadav KN, Narappanawar NS, Shivahare RS, Bhusnur HU, Patil MJ. Development of quality standards of *Terminalia catappa* leaves. *Phcog J.* 3(26),2011:19-24.

[13]. Kadam PV, Deoda RS, Shivatare RS, Yadav KN, Patil MJ. Pharmacognostic, phytochemical and physicochemical studies of *Mimusops elengi* Linn stem bark (Sapotaceae). *Scholarly Res Lib.* 4(2), 2012:607-613.

[14]. Anonymous, World Health Organization (WHO), Quality control methods for medicinal plant material. Geneva,1998.

[15]. Kumar D, Kumar K, Kumar S, Kumar T, Prakash O. *Asian Pacific Journal of Tropical Biomedicine*. 2012:169-175.

[16]. Anonymous, The Ayurvedic Pharmacopoeia of India, Government of India, Ministry of Health and Family Welfare, Department of Indian System of Medicine & Homoeopathy, New Delhi, First Edition, Part-I, Vol. III, 1999: 108-109.

[17]. Sharma P; Cosmetics Formulation, Manufacturing and Quality Control, Vandan Publications,1998:153.

[18]. Mithal B.M., Saha RN; A Handbook of Cosmetic; Vallabh Prakashan ;11, 2002: 02.

[19]. Gennaro AR, Wilkins M: The Science and Practice of Pharmacy, 21 ed, 2000:701.

[20]. K.R. Khandelwal, "Practical Pharmacognosy, Techniques and Experiments," Nirali Prakashan, Nineteenth Edition;2008:157-160.

[21]. K.R. Khandelwal, "Practical Pharmacognosy, Techniques and Experiments," Nirali Prakashan, Nineteenth Edition; 2008:149-156.