

“Formulation and Evaluation of Herbal Shampoo”

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Submitted: 15-05-2023

Accepted: 30-05-2023

ABSTRACT

Shampoos are the cosmetics preparation meant for cleaning the hair by removal of the dirt grease from the hair shaft and scalp. The purpose of using shampoo is to remove dirt that is build up on the hair without out much of the sebum. In the present scenario, it seems improbable that herbal shampoo, although better in performance and safer than the synthetic ones, will be popular with the consumers. Synthetic shampoo shows harmful effect on the hair and scalp like dryness of hair and keratin loss. Due to these reasons herbal shampoos has evolved as an alternative to synthetic shampoo because of the safe and traditionally used ingredients.

The formulation of shampoo using the extracts of *Embelica officinalis*, *Acacia concinna*, *Sapindus mukorossi*, *Eclipta prostrate*, *Aloe barbudensis* in different proportions, Evaluation of organoleptic, Physiochemical, and performance tests in terms of visual assessment, wetting time test, pH, assurance of solid contents, detergency, dirt dispersion, conditioning performance, foam volume, and stability was performed.

Keywords: Herbal shampoo, cosmetics, Evaluation of shampoo, Natural & Healthy

I. INTRODUCTION:

Hair is an integral part of human beauty. Hair care products are primarily meant for cleansing the hair. It also modifies the hair texture, provides nourishment to the hair and gives healthy look to the hair. In humans hair serves lot of puposes like protection against external factors, sebum, apocrine sweat and thermoregulations. Shampoo is the most common hair care cosmetic. It is available either in viscous liquid or powder form, applied for cleaning hair and scalp from dirt, residues of previously applied hair styling products and environmental pollutants. In the early days shampoos were meant only for cleansing hair and

scalp, but the shampoos available today do much more than that. Along with cleansing it leaves the hair easy to comb and controllable while being convenient to use. Hair products, when applied go to the scalp and they clean your scalp and hair. Herbal shampoos are super beneficial for hair. Herbal shampoos are prepared from natural ingredients and are meant for cleansing hair and scalp just like regular shampoo. These shampoos are free from side effects since no surfactants are involved, has good stability and are less harmful compared to synthetic shampoo. Synthetic shampoo contains surfactants. Long term use of these surfactants can lead to serious effects like scalp irritation, loss of hair, drying of hair and eye irritation. Due to these reasons the public is getting attracted towards herbal cosmetics due to its insignificant side effects and inexpensive nature.

Shampoos are most likely utilized as beautifying agents and are a viscous solution of detergents containing suitable additives preservatives and active ingredients. Shampoos are most probably used as cosmetics. It is a hair care product that is used for cleaning scalp and hair in our daily life. They are used for removal of oils, dandruff, dirt, environmental pollutions etc. It is usually applied on wet hair, massaging into the hair, and cleansed by rinsing with water. Many synthetic shampoos are present in the current market both medicated and non- medicated, however, herbal shampoo popularized due to natural origin which is safer, increases consumer demand and free from side effects.

In synthetic shampoos, surfactants (synthetic) are added mainly for their cleansing and foaming property, but the continuous use of these surfactants leads to serious effects such as eye irritation, scalp irritation, loss of hair, and dryness of hairs. Alternative to synthetic shampoos we can use shampoos containing natural herbals. However,

formulating cosmetic products containing only natural substances are very difficult. There are a number of medicinal plants with potential effect on hair used traditionally over years around the world and are incorporated in shampoo formulation. These medicinal plants may be used in extracts form, their powdered form, crude form, or their derivatives. To develop a shampoo containing an only one natural substances which would be safer with milder effect, then the synthetic shampoo is difficult and also it should possess good foaming, detergency, and solid content as such synthetic shampoo. Hence, we considered in detailing an unadulterated natural cleanser utilizing conventional technique using regularly utilized plant material for hair the present study. Herbal shampoo was formulated containing suitable ingredient such as *Emblica officinalis*, *Acacia concinna*, *Sapindus indica*, *Eclipta prostrata*, *Aloe barlxidensis*, n different proportions to formulate and evaluate its physicochemical properties. The pericarp of *S indica* poir (Soapnut) products of *Phyllanthus emblica* (Amla), and units of dried *A.concinna* (Shikakai) have been utilized customarily as old stories framework for purging hair. Cleanser nut and shikakai when shaken with water create rich foam due to their high saponin content it indicates frothing impact Amla fruit and *c. auriculata* flowers are used to promote hair growth, anti-dandruff agent, strengthen hairs, and prevent hair fall *E prostrata* leaves (Bhringraj) commonly known as false daisy in English and Bhringraj in India, to promote hair growth and prevent graying of hair. A shampoo is basically a solution of a detergent containing suitable additives for other benefits such as hair conditioning enhancement, lubrication, medication etc. Now-a-days many synthetic, herbal, medicated and non-medicated shampoos are available in the market but popularity of herbal shampoo among consumers is on rise because of their belief that these products being of natural origin are safe and free from side effects.

Synthetic surfactants are added to shampoo primarily for the foaming and cleansing action but their regular use leads to dryness of hairs, hair loss, irritation to scalp and eyes. Herbal formulations are considered as alternative to synthetic shampoo but formulating cosmetics using completely natural raw material is a difficult task. There are large numbers of medicinal plants which are reported to have beneficial effects on hair and are commonly used in formulation of shampoo. These plant products may be used in their

powdered form, crude form, purified extracts, or derivative form. It is extremely difficult to prepare a herbal shampoo using a single natural material that would be milder and safer than the synthetic ones, and at the same time would complete favourably with its foaming, detergency and solid content. In synthetic shampoos, surfactants are added mainly for their cleansing and foaming property, but the continuous use of these surfactants leads to serious effects such as eye irritation, scalp irritation, loss of hair, and dryness of hairs. Alternative to synthetic shampoo we can use shampoos containing natural herbals. However, formulating cosmetic products containing only natural substances are very difficult. There are a number of medicinal plants with potential effects on hair used traditionally over years around the world and are incorporated in shampoo formulation. Shampoos are most probably used as cosmetics. It is a hair care product that is used for cleaning scalp and hair in our daily life. Shampoos are most likely utilized as beautifying agents and are a viscous solution of detergents containing suitable additives preservatives and active ingredients. A liquid or cream preparation of soap or detergent to wash the hair is called as shampoo. Herbal shampoos are made of extracts of natural ingredients, they are suitable for all types of hair and do not cause major allergies or side effects. The shampoos are crafted with pure and organic ingredients and are free from synthetic additives.

1.1 History Indian subcontinent

In the Indian subcontinent, a variety of herbs and their extracts have been used as shampoos since ancient times. The first origin of shampoo came from the Indus valley civilization. A very effective early shampoo was made by boiling *sapindus* with dried Indian gooseberry (amla) and a selection of other herbs, using the strained extract. *Sapindus*, also known as soapberries or soapnuts, a tropical tree widespread in India, is called *ksuna* in ancient Indian texts and its fruits pulp contains saponins which are a natural surfactants. The extract of soapberries creates a lather which Indian text called *phenaka*. It leaves the hair soft, shiny and manageable. Other products used for hair cleansing were *shikakai* (*Acacia Concinna*), *Guru Nanak*, the founder and the first Guru of Sikhism, made references to soapberry tree and soap in the 16th century.

Cleansing the hair and body massage (*champu*) during one's daily bath was an indulgence of early

colonial traders in India. When they returned to Europe, they introduced the newly learned habits, including the hair treatment they called shampoo.

1.2 REQUIREMENTS OF SHAMPOO:

- It should be nontoxic and non-irritating to the hair and scalp.
- It should remove sebum and atmospheric pollutants from scalp hair.
- It should be easily removed on rinsing with water.
- It should deliver an optimal level of foam to satisfy the expectations of the user.
- It should remove the residues of previously applied hair styling lotions and sprays.

1.3 ANATOMY OF HAIR

The hair is made up of 95% keratin protein. Each hair has a hair shaft and hair root. Hair is a protein filament that grows from follicles found in dermis. The hair shaft consists of a cortex and cuticle cells, and a medulla for some types of hair.

The hair structure consists of 3 different parts.

- **Medulla** : It is the innermost layer of the hair shaft, made up of an amorphous, soft, oily substance.

- **Cuticle** : Thin protective outer layer that contains nutrients beneficial for hair growth. It is highly keratinized with cell shaped like scales that are layered one over the other, measuring about 60 micrometers long and about 6 micrometers wide.
- **Cortex** : It is the main constituents of the hair, containing long keratin chains which gives elasticity, suppleness and resistance to the hair. The cells of the cortex are joined together by an intercellular cement rich in lipids and proteins.

1.4 GROWTH CYCLE OF HAIR

Hair growth cycle consists of four phases:

- **Anagen (growth phase)**: It is the growing phase. The anagen phase is when your hair grows your hair follicle forms a new hair shaft.
- **Catagen (transitional phase)**: During this phase the hair follicle shrinks and hair growth slows.
- **Telogen (resting phase)**: It is the resting phase where hair growth stops and new hair begins the growth phase, pushing the old hair out.
- **Exogen phase (last phase)**: It is hair growth cycle where hair strand completely detaches from the scalp and sheds off.

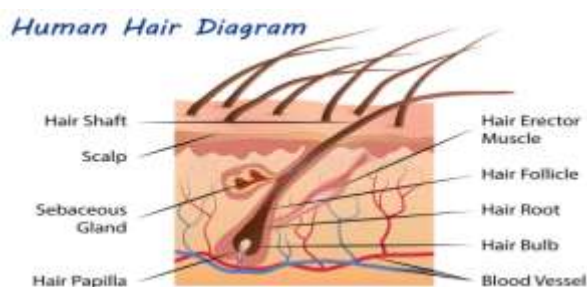


Fig 1. Hair



Fig 2 . Hair growth cycle

1.5 HAIR PROBLEMS:

- **Dandruff** : Dandruff is a non-inflammatory harmless skin condition that affects scalp and might result in hair loss. It is scaly and adheres to the root of the hair.
- **Hair loss**: The main reason behind the hair loss is stress, medication, changes in hormone

and many hair styling products can contribute to hair loss.

- **Oily hair/Greasy hair**: Oily hair is caused by excessive production of natural oil (sebum) by the scalp sebum is produced by sebaceous glands which sometimes “work overtime” leading to excessive amount of oil.

- **Dry hair:** Dry hair occurs due to deficiency of proteins in the diet, menopause, anaemia, hormonal imbalance, birth control pill can also lead to dry hair.
- **Split Ends:** Splits ends occurs when the hair ends dry and other reasons are exposure to extreme weather conditions. Hair care techniques such as straightening and curling and chemical hair products may cause split ends.

1.6 TYPES OF SHAMPOOS:

Shampoos are of following types

- Powder shampoo
- Lotion shampoo
- Clear liquid shampoo
- Solid gel shampoo
- Medicated shampoo
- Liquid herbal shampoo

1.7 BENIFITS OF HERBAL SHAMPOO:

1. More shine
2. Less hair loss
3. Long lasting colour
4. All natural, no chemicals
5. Stronger and more fortified hairs
6. won't irritate skin or scalp
7. Keep healthy natural oils



1.8 FUNCTION OF HERBAL SHAMPOO:

1. Lubrication
2. Conditioning
3. Hair growth
4. Maintenance of hair colour
5. Medication

1.9 Need of Herbal shampoo:

The skin on our head produce a greasy fluid called sebum. It is produced to protect the hair by coating itself all over the head. This give the hair a healthy shine but when secretes in large amount it makes the hair look dirty. Herbal shampoos for hair growth are formulated to strengthen the hair follicles by delivering essential

oils and nourishment all through the roots and follicles.

1.10 ADVANTAGES OF HERBAL SHAMPOO:

1. Pure and organic ingredients
2. Free from side effects
3. No surfactants eg- SLS
4. No synthetic additives
5. No animal testing
6. Earth and skin friendly
7. Promote hair growth
8. Remove dandruff

1.11 LIMITATIONS OF HERBAL SHAMPOO:

1. Natural products affect product uniformity, quality control.
2. Less stable so, preservatives should be added.
3. Seasonal variation of plant constituents.
4. Some herbs are to scalp. Ex: lemon, menthol, peppermint and papaya etc.



1.12 LIST OF MARKETED HERBAL SHAMPOOS:

1. Patanjali Kesh kanti Hair Wash:



Patanjali kesh kanti hair cleanser safely washes away dirt, and dust from hair with its herbal composition that also leaves your tresses

silky and shining. The natural medicinal ingredients treat hair and scalp of dryness and dandruff. Patanjali kesh kanti hair wash is a 100% natural herbal shampoo that strengthens and shines your hairs. It is fine at reducing hair loss and removing dandruffs, also prevents hardness and dryness from your hair. It provides necessary nutrients to your hair and makes it healthy and strong.

Features and Review

- Beneficial in healing the dryness and roughness of hair
- Prevent hair fall and improve the hair texture
- Nourish the dry scalp
- Minimizes the dandruff and flakes
- Makes hair soft, silky and shiny

2. Himalaya anti hair fall herbal shampoo:



Himalaya anti hair fall shampoo is not just a herbal shampoo amongst so many shampoos in India but it is a shampoo with anti-hair fall features. So, in case you are looking for a good herbal shampoo for the hair fall problems in men and women, then this can be used. Along with the hair fall control qualities, it is also a clarifying shampoo. This is herbal shampoo with hair fall fighting abilities has eclipta alba that strengthens the roots of the hairs and butea fondosa to fight the hair fall. Even people with no hair fall problem can use this. This doesn't lather much as this is a clarifying shampoo.

Features and Review:

- Lathers less as it clarifies
- Reduces hair fall
- The shampoo has a soft floral fragrance that is nice and mild

- It is pearly white in color and has a smooth medium consistency, not too thick or too runny.

3. Indulekha bringha anti hair fall shampoo:



Indulekha bringha anti-hair fall shampoo is primarily made for hair fall control. It uses the power of ingredients like bhringraj plant, neem, shikakai, amla and many others. It does not contain any artificial color and also contain the power of 9 Bhringa plants. Other than that, it is suitable for all hair types and reducing the hair fall due to breakage. It contains added fragrance or paraben that can harm your hair in anyways. It's the best herbal shampoo in India for hair fall. You can use it along with the Indulekha bringha hair oil.

Features and Review:

- Good for everyday use
- Has bhringraj plant extracts
- Gives deep conditioning and anti-breakage benefits to your hair
- Gently cleanses the hair and nourishes the hair
- Leaves your hair stronger and healthier from within

4. Vatika herbal health shampoo:



Dabur vatika naturals health shampoos has the goodness of satt poshan which mean seven beneficial ingredients like henna, shikakai, olive, almond, hibiscus, amla, reetha. The herbal shampoo with seven natural ingredients not only cleanses the scalp and hair effectively to remove all the dead skin cells, product build up and oils but it also reinforces strength and shine. The power ingredients make the scalp clear and induce strength and smoother to the hair. Dry and damaged cuticle of the hair is also repaired by such herbal botanicals. It's the best herbal moisturizing shampoo in India.

Features and Review:

- Goodness seven natural ingredients like henna, shikakai, olive, almond, hibiscus, amla and reetha.
- Makes hair smooth, shiny and nourished.
- Gently cleanses the hair deep conditions

II. LITERATURE REVIEW:

1. Preethi P. Jaya, Padmini K., Srikanth J., Lohita M., Swetha K., Rao P. Vengal (2013)

Shampooing is the most common form of hair treatment. Shampoos are primarily been products aimed at cleansing the hair and scalp. A more radical approach in popularizing herbal shampoo would be to change the consumers' expectations from a shampoo, with emphasis on safety and efficacy. The present paper emphasizes on composition, types, methods of evaluation, also a brief review on herbal shampoo formulations.

2. Pawan Maurya, Shashikant maurya, Piyush Yadav, Manoj kumar Yadav, Suraj Maurya, Satyam jaysawal. (2021)

Herbal shampoo is the natural hair care products which is use to remove grease, dirt, dandruff and promote hair growth, strengthens and darkness of the hair. It is also provide softness, smoothness, and shines for the hair.

3. Utane R, Deo S and Itankar P. (2017)

We are utilizing manufactured items for our hair, losing their magnificence, quality, strength, volume and shine. Every single manufactured item like cleanser contains a destructive substance which is in charge of damage of hair.



4. Vinayak M. Chavan, Kundan J. Tiwari Kiran A. Suryavanshi, Aditya S. Bhor. (2019)


The formulation at laboratory scale was done and evaluated for number of parameters such as pH, foam formulation, viscosity, conditioning and wet ability werw evaluated, and also to ensure its safety and efficacy.




III. EXPERIMENTAL METHODOLOGIEES:




3.1 LIQUID HERBAL SHAMPOO:

HERBS USED IN THE HERBAL SHAMPOO:



Botanical name	Common name	uses	Figure
Lawsonia Inermis	Heena	Promotes growth of hair, conditioner	
Azadirachta Indica	Neem	Antimicrobial agent, prevents the dryness of hairs and flaking of hairs	


Ocimum sanctum	Tulsi	Antimicrobial and anti-lice property.	
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<p>Emblica officinalis</p>	<p>Indian gooseberry/ Amla</p>	<p>Promotes hair growth, prevents greying and controls dandruff.</p>	
<p>Acacia concinna</p>	<p>Soap pod/ Shikakai</p>	<p>Retains natural oil of hair, keeps hair healthy.</p>	
<p>Aloe barbadensis</p>	<p>Aloe vera</p>	<p>Conditioning and moisturizing effect</p>	

<p>Citrus lemon</p>	<p>Lemon</p>	<p>Maintains the pH and imparts fragrance to preparation</p>	
<p>Sapindus mukorossi</p>	<p>Soap nut/ Reetha</p>	<p>Detergent and antidandruff</p>	
<p>Zingiber Officinalis</p>	<p>Ginger</p>	<p>Promotes hair growth</p>	

Shampoos is the most common form of hair treatment. Shampoos are

<p>Eclipta prostrata</p>	<p>Bhring raj</p>	<p>Hair tonic</p>	
<p>Withania somnifera</p>	<p>Ashwa gandha</p>	<p>Controls hair fall, promotes hair growth, and improves circulation of the scalp</p>	

<p>Camellia Sinensis</p>	<p>Green tea leaves</p>	<p>Hair growth and enrichment</p>	
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<p>Baccopa monneri</p>	<p>Brahmi</p>	<p>Supports the hair growth</p>	
<p>Aliium cepa</p>	<p>Onion powder</p>	<p>Anti- bacterial</p>	

3.2 PREPARATION METHOD:

- Collection of materials Ingredients required for the preparation are collected and washed thoroughly and dried.
- Weighing ingredients are weighed individually and soaked overnight.
- Decoction preparation Ingredients are boiled in the same water used for soaking on medium flame, then allow it to cool and filter.
- Filter it by using muslin cloth, and collect the filtrate.
- Then add incorporate preservative (eg: Methyl paraben) to prevent microbial growth.

3.3 EVALUATION OF HERBAL LIQUID SHAMPOO:

• Organoleptic evaluation/ visual assessment:

The prepared formulations are evaluated in terms of color, clarity, color etc.

• pH determination:

The pH of the shampoo is measured by using pH meter.

• Percentage of solid content determination:

4g of shampoo is taken in a previously weighed evaporating dish and evaporated by placing the evaporating dish on the hot plate. The final weight is noted down. Percentage of solid contents of shampoo left after complete evaporation is calculated.

• Foaming ability and Foaming stability:

The cylinder shake method is employed in the foaming ability and stability test. In this method 50ml of the 1% shampoo solution is taken in a 250ml graduated cylinder and covered the cylinder with hand. The cylinder is then shaken for 10 times. The volume of the foam appeared due to shaking is measured after every one minute consecutively for 5 minutes.

• Dirt dispersion test :

About 1% of shampoo solution taken in a test tube and 1 drop of India ink is added. The test tube is stoppered and shaken for about 10 mins.

The amount of ink present in the foam is indicated as None, light, moderate, or heavy.

• **Cleaning action :**

About 1 g of grease is spread on non-adsorbent cotton and kept in conical flask containing 1% shampoo solution. The conical flask is shaken for 1 hr in mechanical shaker. Cotton is collected, dried and weighed. The amount of grease removed is determined by using the equation given below:

$$DP = 100 (1-T/C)$$

Where,

C – Weight of grease in control sample

T- Weight of grease in test sample

DP- Percentage of detergency power

• **Conditioning performance evaluation:**

Artificial hair strands are collected from salon and are divided into two batch (control and test) length 10 cm approximately. The test hair sample is washed with formulated shampoo and control is the one without washing. The test sample has to be washed with shampoo atleast for 10 times and sir dried. Blind touch test method is used for determining the conditioning effect of shampoo. About 20 student volunteers are selected and are made to such the hair samples.the conditioning performance of shampoo is rates in terms of score 1-4 (4- excellent, 3- good, 2- satisfactory, and 1- poor).

5. Composition of formulated herbal shampoo:

Material Quantity	Required Weight
Shikakai powder	1gm
Amla powder	1gm
Aloevera	1gm
Reetha powder	2gm
Fenugreek seeds	0.5gm
Ashwagandha powder	1gm
Brahmi powder	1gm
Onion powder	1gm
Methyl paraben	1gm
Heena leaves	q.s
Neem leaves	q.s
Tulsi leaves	q.s
China rose	q.s
Lemon	q.s
Ginger	q.s
Bhringraj oil	q.s
Green tea leaves	q.s
Rose oil	q.s

IV. RESULT AND DISCUSSION:

Evaluation Parameter Table:

Sr No	Evaluation	Herbal shampoo

1.	Organoleptic evaluation a. Colour b. Clarity c. Odor	a. Brown b. Clear c. Good
2.	pH determination	6.4
3.	Percentage of solid content determination	25%
4.	Foaming volume	168ml
5.	Foam type	Dense, small
6.	Wetting time test	120 second
7.	Dirt dispersion test	Light
8.	Cleaning action	31.16%
9.	Conditioning performance evaluation	Good

V. CONCLUSION:

The present review focuses on the uses and importance of herbal shampoo. It includes the awareness and need for the cosmetics with herbal ingredients, as it is strongly believed that the herbal products are safe and free from side effects. It emphasizes on types, methods of preparation and evaluation of polyherbal shampoos. The present study was carried out with the aim of preparing the herbal shampoo that reduces hair loss during combing, safer than the chemical conditioning agents as well as to strengthen the hair growth. Herbal shampoo was formulated with the aqueous extracts of medicinal plants that are commonly used for cleansing hair traditionally, Use of conditioning agents (synthetic) reduces the protein or hair loss. To provide the effective conditioning effects, the present study involves the use of shikakai, amla, and other plant extracts instead of synthetic cationic conditioners. The main purpose behind this investigation was to develop a stable

and functionally effective shampoo by excluding all types of synthetic additives, which are normally incorporated in such formulations. To evaluate for good product performance of the prepared shampoo, many tests were performed. The results of the evaluation study of the developed shampoo revealed a comparable results for quality control test, but further scientific validation is needed for its overall quality.

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