



Formulation and Evaluation of Herbal Anti-Dandruff Shampoo

Miss. Serena Moses Katapur¹, Dr. Asha S. Shinde², Dr. Shashikant Apte³

¹ Email Id: serenakatapur0908@gmail.com

Mobile No: 7058419527

Department Of Cosmetic Science

Late Narayandas Bhawandas Chhabada Institute of Pharmacy,
Raigaon, Satara. Dist: Satara, Maharashtra. 415020

² Assistant Professor

³ HOD [Department of Hematology],

Sahyadri Hospital

Late Narayandas Bhawandas Chhabada Institute of Pharmacy
Raigaon, Tal: Jaoli, Satara. Dist: Satara, Maharashtra. 415020.

Email Id: serenakatapur0908@gmail.com

Mobile No: 7058419527

ABSTRACT :

Shampoos help to remove excess dust, oil on the scalp and skin. Most of the content ingredients in shampoos are usually chemical and hence they get severely attacked because of the potential risk of side effects with their use. The focus of this study was mainly to eliminate the harmful synthetic ingredient present in dandruff, anti-dandruff and hence to replace it with the safe natural ingredients. Effort has been created to integrate the modern formulation technology converting into a formula that is based upon natural ingredients. Herbal shampoo was mainly prepared with ingredients like Spinach, Garlic, Flaxseeds, Reetha, Aloe vera, Curry Leaves. All the ingredients are extracted and they create a unique texture with respect to stability tested parameters. As we see in a review of research data, here the development of anti-dandruff products was found to be safe, effective and economical. It was also proved to be a stable improvement. The formulation and evaluation of herbal shampoo is mainly focused to give the moisturizing and nourishing property mainly to hair and also helps in enhancing the growth of hair. Shampoo is known as a beautifying agent as it also uses surfactant to reduce the surface tension of the desired formulation. The cause of dandruff is generally considered due to the presence of pitosporum yeast. These get affected to the scalp. The surfactant generally may be in liquid, solid or powder forms. By using these surfactant it is generally helpful in removing the surface grease, dirt, dandruff problems, irritation, skin debris from the hairs that do not show adverse effect on the users.

KEYWORDS: Herbal Shampoo, Skin, Spinach, Garlic, Reetha, Aloe vera, Curry Leaves, Flaxseeds, Surfactant, Dandruff, Skin debris.

INTRODUCTION:

Since the ancient times, the humans have mainly used herbs to cleanse and beautify their hair, which is also an essential component of the human beauty. Synthetic agents mainly have accounted for a significant portion of the market over a period of time, but we can also focus that the consumers are mainly becoming more conscious due to their negative effects on eyes, skin, and hair. The population got drawn to herbal products as they were less expensive and had minimum adverse effects. The term herbal mainly focuses on denoting an indication of safety as opposed to synthetic, which is rather harmful to human health. Shampoos are also used for more than just cleansing hair; as they also keep hair lustrous, thicker, longer lasting, and free of oiliness. [1]

Shampoo is typically a hair care product that is used to clean hair. It mainly comes in the form of a thick liquid. Shampoo is generally a liquid or cream-based mixture of soap or detergent that is used to cleanse hair. The goal of using shampoo is to basically remove the unwanted particles and dirt which build up in the hair and which help to control scalp bacteria. Shampoo is a hair care product that is used for the elimination of the oils, dusts, pore and skin debris, dandruff, environmental pollution and other contaminant particle that are regularly increases in the hair. Shampoo is typically composed of 10 to 20 ingredients. Shampoo comes in different forms that generally include powder, transparent liquid, lotion, solid gel, medicinal, and liquid herbal. [2]

The word shampoo is basically derived from the word "Champoo" as it refers to an Indian traditional massage. Due to the presence of dull film it left on hair herbs began to added first commercially available shampoo available in the 20th century. Shampoos are generally hair care product used to remove all oils skin particles, dandruff. Environmental pollutant and other contaminant particle that gradually build up in hair. It uses herbs of the plant

such as for the purpose of washing of hair and scalp. Hair is an integral part of our beauty. Hair care products are used to cleanse the hair and modifies hair texture providing them nourishment and gives healthy look to the hair. [3]

IDEAL PROPERTIES OF SHAMPOO:

- 1] It should not cause irritation on scalp, eye and skin.
- 2] It should produce pleasant fragrances from hair.
- 3] It should completely remove the dirt and other foreign particle from the hair.
- 4] It should completely remove dust by rinsing water on hair. [4]

SHAMPOO MUST CONTAIN THE FOLLOWING:

- 1] Detergents
- 2] Conditioners
- 3] Thickeners
- 4] Fragrances
- 5] Preservatives [5]

BENEFITS OF HERBAL SHAMPOO:

- 1] It gives lustrous appearance.
- 2] It gives nutrition supplement to hair.
- 3] Helps in improve antidandruff activity. [6]

OBJECTIVES:

- 1] Herbal Shampoo generally helps to cleanse hair and scalp effectively using natural ingredients.
- 2] It helps in promoting hair health and growth and also addresses issues like dryness, dandruff, and itchiness while ensuring a safe and gentle application.
- 3] It mainly contains surfactants that emulsify oily dirt, allowing it to be washed away easily.
- 4] Herbal shampoos for hair fall are generally made out of various natural ayurvedic ingredients, natural oils, minerals, and herbal extracted compounds. These ingredients help to work to improve the moisture in your hair by hydrating the follicles and roots of your hair.
- 5] Herbal shampoos that are used for hair growth are made to strengthen the hair follicles that include by giving various essential oils and also nourishment all throughout the root and follicles. In result to this, promotion of hair growth occurs and stimulates the formation of new and healthy hair roots.
- 6] Regular use of Herbal shampoos can generate wonders for your hairs. Scalps need to be maintained by a perfect balance of oil and also by maintaining the pH levels in order to have beautiful, healthy, and strong hair. By using the Herbal shampoos, you can definitely get the perfect oil balance.
- 7] Herbal shampoos are generally made out of natural and essential antiseptic properties that mainly prevent our hair and scalp from the harsh UV rays of the sun thus play a vital role in preventing skin infections.
- 8] Ayurvedic Herbal shampoos are consistently made of natural ingredients that are suitable for all type of skin. Hence, there is no need to worry about any skin allergies with the use of herbal shampoos.
- 9] Hair grows healthy with regular usage of herbal shampoos by giving your hair a lustrous, shiny, and bouncy hair. [7]

DRUG PROFILE:**Garlic:**

Name: Garlic

Family: Amaryllidaceae

Biological Source: Bulb of plant

Biological Name: Allium Sativum

Chemical Constituents:

It contains 29% Carbohydrate, 5.6 % protein, 0.1% fats and 0.06 to 0.1% volatile oil, Allcin, Diallyl Sulfide, Diallyltrisulfide, S-Allyl cysteine.

Benefits of Garlic:

- 1] It has generally anti-bacterial, anti-inflammatory and anti-oxidant properties.
- 2] Helps in promoting a healthy skin environment.
- 3] It is also rich in antioxidants that can help skin to protect from various damage caused by free radicals and also environmental stressors.

Medicinal Uses of Garlic:

- 1] It generally helps to unclog pores.
- 2] Also helps in removing blackheads and face acne scars.
- 3] Garlic's antifungal properties can help combat fungal infections and promote healthy skin.
- 4] Garlic can help alleviate irritation and repair dry, chapped, or flaky skin. [8]

Spinach Leaves:



Name: Spinach

Family: Amaranthaceae

Biological Source: Dried leaves of Spinach

Biological Name: Spinacia Oleracea

Chemical Constituents:

Vitamin K, Vitamin B, Magnesium, Folic Acid, Iron, Vitamin C, Vitamin B, Omega 3 Fatty Acid.

Benefits of Spinach Leaves:

- 1] It helps in appetite stimulation.
- 2] Generally used in Blood generating therapy.
- 3] Helps in decreasing oxidative stress.

Medicinal Uses of Spinach Leaves:

- 1] Helps in promoting the collagen synthesis.
- 2] Magnesium and Iron helps in promoting hair health.
- 3] Helps in the GIT disorder. [9]

Flaxseeds:

Name: Flaxseeds

Family: Linaceae

Biological Source: Dried seeds of Flaxseed

Biological Name: *Linum Usitatissimum*

Chemical Constituents:

Linoleic acid, Lignans, Cyclic peptide, Omega 3 fatty acid, alkaloid, cyanogenic.

Benefits of Flaxseeds:

- 1] Used to treat cardiovascular disease, diabetes, cancer, arthritis, osteoporosis, neurological disorder.
- 2] Helps in removing various toxins and dead cells from the scalp.
- 3] Flaxseeds are also rich in the vitamin E, useful for both skin and hair health.

Medicinal Uses of Flaxseeds:

- 1] Flaxseeds help to improve circulation in the head.
- 2] Also helps in promoting the hair growth and slowing down hair breakage.
- 3] Helps in preventing premature graying of the hair. [10]

Reetha:

Name: Reetha

Family: Sapindaceae

Biological Source: Dried fruit of Reetha

Biological Name: *Sapindus Laurifolius*

Chemical Constituents: It generally contains triterpenoid saponins, sugars, mucilage, and various fatty acids, including oleic and linoleic acids.

Benefits of Reetha:

- 1] Helps in the cleansing of the scalp.
- 2] Can be also used as detergent.
- 3] Acts as an anti-fungal agent.

Medicinal Uses of Reetha:

- 1] Helps in providing shining and silky hair.
- 2] It also has antimicrobial property. [11]

Curry Leaves:



Name: Curry Leaves

Family: Rutaceae

Biological Source: Dried curry leaves

Biological Name: Murraya Koeniggi

Chemical Constituents:

Linalool (32.83%), Ethanol (7.44%), Geranyl acetate (6.18%), (E)-B-Ocimene.

Benefits of Curry Leaves:

- 1] Its antifungal properties generally help in reducing dandruff and itchiness leaving you with a clean scalp and healthy hair.
- 2] Curry leaves help in moisturizing your scalp.
- 3] Helps in promoting hair growth.

Medicinal Uses of Curry Leaves:

- 1] It generally helps in preventing dandruff.
- 2] Curry leaves are rich in cell rein forcements that saturate the scalp while disposing the dead hair follicle.
- 3] Generally helps in preventing hairfall, premature hair greying. [12]

Aloe vera:



Name: Aloe vera

Family: Asphodelaceae

Biological Source: Aloe vera leaves

Biological Name: Aloe barbadensis

Chemical Constituents:

Glycosides, Vitamins, Enzymes, Minerals, Sugars, Lignin, Saponins, Salicylic acid.

Benefits of Aloe vera:

- 1] It helps in reducing inflammation.
- 2] It also acts as an antifungal agent.
- 3] It helps to calm the dry and itchy scalp.

Medicinal Uses of Aloe vera:

- 1] It deeply cleans oily hairs.
- 2] Aloe vera contains proteolytic enzyme that helps to repairs dead skin cells on the scalp.
- 3] Helps in promoting hair growth. [13]

MATERIAL AND METHODS:

Extraction Process:

1] Preparation of Spinach extract:

The extraction of spinach was carried out by the maceration process.

10 g of powdered dried leaves of spinach were added in 100 ml of distilled water.

They were kept for 24 hours.

Further it was filtrate and evaporate to dryness.



2] Preparation of Garlic extract:

The extraction of garlic was carried out by the maceration process.

Mixture of garlic and ethanol in the ratio of 1:10 [W/V] was carried out.

It was carried out using 95% of the ethanol.

1 g of sample was added in 200 ml of 95% ethanol.

It was placed for soaking for upto 48 hours at room temperature.



3] Preparation of Reetha extract:

The extraction of reetha was carried out the cold maceration process.

10 g of reetha powder was added into 30 ml of ethanol.

It was kept for cold maceration upto one day.



4) Preparation of Curry leaves extract:

The extraction of curry leaves was carried out by the maceration process.

Preparation of ethanol extract by dissolving 10 g of curry leaves powder into 100 ml of ethanol.

Distilled water had a proportion of 8:2 [W/V].

It was then covered with filtered paper and kept aside for 24 hours in dark area at room temperature.

Filter supernatant was collected.

The solvent is evaporated by incubating at room temperature for 48 hours.



5) Preparation of Flaxseeds extract:

The extraction of flaxseeds was carried out the decoction process.

First addition of flaxseeds to boiled water with constant stirring until a thick mucilage is obtained.

Prepared mucilage is then passed through the suitable sieve.

As it is passed from the sieve, it should be stored at room temperature until it is needed for further use.



6) Preparation of Aloe vera extract:

The extraction of aloe vera was carried out by the maceration process.

25 ml of juice of aloe barbadensis was removed from leaves. [14]



FORMULATION TABLE:

Sr. No.	Ingredients	Quantity [100 ml]	Uses
1.	Spinach	20 ml	Anti-Hair fall
2.	Garlic Peels	10 ml	Anti-Fungal
3.	Curry Leaves	20 ml	Anti- Dandruff
4.	Flaxseeds	5 ml	Hair growth promoter
5.	Aloe vera	5 ml	Conditioning Agent
6.	Reetha	20 ml	Foaming Agent
7.	Citric Acid	2 ml	Buffering Agent
8.	Rose Oil	2 ml	Perfume
9.	Methyl Paraben	2 ml	Preservative
10.	Gelatin	q.s	Thickening Agent

Table 1. Formulation Table**FORMULATION OF SHAMPOO:****1. Prepare the Herbal Extracts:**

If you are using pre-made Spinach Extract, Garlic peels Extract, Reetha Extract, Curry Leaves Extract, Flaxseeds Extract, Aloe Vera Extract, measure out the quantities as per the formula.

2. Mix Water Phase:

In a clean, sterilized mixing container, combine Rose Oil (2 ml) and Citric Acid (2 ml). Stir gently to mix the two waters together. This will be the base of your shampoo. Rose oil gives perfume as well as citric acid is used as buffering agent.

3. Add Herbal Extracts

Add Spinach Extract (20 ml), Garlic peels Extract (10 ml), Reetha fruit Extract (20 ml), Curry Leaves Extract (20 ml), Flaxseeds Extract (5 ml), Aloe vera Extract (5 ml) to the gelatin mixture. Stir well to combine the extracts with the gelatin. Spinach gives anti-hair fall properties whereas Garlic shows Anti-fungal properties, Reetha is used as a foaming agent, Curry Leaves are useful to prevent anti-dandruff properties, Flaxseeds are known as hair growth promoters where as Aloevera is known as conditioning agent.

4. Add Methyl Paraben:

Add Methyl Paraben (2 ml) as a preservative. This will help prevent microbial growth and extend the shelf life of the shampoo. Ensure that it dissolves well in the solution. If necessary, warm the mixture slightly to help the paraben dissolve, but do not heat it too much as that might affect the stability of the other ingredients.

5. Mix Well

Stir the entire mixture thoroughly to ensure that all ingredients are well incorporated. Make sure there are no lumps, especially from Methyl Paraben.

6. Check pH Level

The ideal pH for a shampoo is between 4.5 and 5.5, which is close to the natural pH of the scalp. You can check the pH using pH test strips. If the pH is too high (alkaline), you can adjust it by adding a small amount of citric acid (a pinch) to bring it down to the ideal range. Mix well after adjusting the pH.

7. Packaging

Pour the shampoo into a sterilized 100 ml bottle. Ensure the bottle is clean and free of contaminants. Seal the bottle tightly.

8. Storage

Store the shampoo in a cool, dry place away from direct sunlight. Use within 2-3 months, or as recommended by the preservative (Methyl Paraben), as

it will help prevent bacterial growth and maintain the shampoo's effectiveness. [15]

EVALUATION PARAMETER:

1] Physical Appearance:

The formulation of the herbal shampoo was formulated and evaluate generally for its physical appearance. It mainly included state, colour, odour, texture.

2] Determination of pH:

The determination of pH of the prepared herbal shampoo in distilled water 10% [W/V] was evaluated. The evaluation parameter was carried out by pH analyzer at room temperature.

3] Surface tension measurements:

The prepared shampoo in distilled water 10% [W/V] was evaluated for surface tension. The parameters were evaluated using stalagmometer in room temperature. The surface tension was determined using stalagmometer by a method generally known as drop count method.

4] Determination of Foam ability and foaming stability test:

Cylinder shake method was used to determine foam ability. The volume of foam produced with the help of formulated herbal shampoo was determined by placing 50 ml of 1% shampoo solution into the clean and dry 250 ml measuring cylinder. The initial volume was recorded. The final volume was recorded by shaking the measuring cylinder 10 times. Hence, the foam formulation was calculated as follows:

$$\text{Foam formation} = \text{Final volume of shampoo} - \text{Initial volume of shampoo}$$

Retention of foam volume was recorded in each 1 minute time interval for 4 minutes.

5] Dirt Dispersion Test:

Two drops of the formulated herbal shampoo was added in test tube having 10 ml of distilled water. To this, one drop of Indian ink was added and the test tube was then shaken for 10 times. Amount of ink in the foam shows indication as like none, light, moderate or heavy.

6] Solid content test:

The clean and dry evaporating dish was taken and weighed with the help of the weighing balance. 4 g of shampoo was placed in an evaporating dish. The weight of dish with shampoo was taken as W1. The liquid portion of shampoo was evaporated and was done by placing evaporating dish on hot plate. The weight of evaporating dish with solid content was been taken as W2. The weight and percent weight of solid content was calculated. %Solid Content = $(W1 - W2) / W1 * 100$ [16]

RESULT AND EVALUATION:

The present study of spinach and garlic shampoo was stated as developed, stable and effective shampoo without using any synthetic chemicals. Spinach and garlic shampoo formulation was under the purpose that helps in fulfilling the parameters generally as reduced hair fall, promote hair growth, remove dirt, remove surface of grease and treating to psoriasis disease.

In the formulation of spinach and garlic shampoo various extracts of reetha, aloe vera, garlic, spinach, flaxseeds were taken into consideration for the preparation of shampoo.

Sr. No	Parameters	Observation
1.	Colour	Cream
2.	Odour	Pleasant and Natural
3.	State	Liquid
4.	Texture and viscosity	Smooth, medium viscosity
5.	pH	5.6 (Acidic)

6.	Surface Tension Measurements	37.63 dyne/cm
7.	Skin Irritation Test	No Irritation
8.	Foam Stability	Stable
9.	Percent Solid Content	22.15%
10.	Solubility	Insoluble in water

Table 2. Result and Evaluation

CONCLUSION:

The herbal shampoo made with spinach, garlic peels, curry leaves, flaxseeds, rose oil, reetha, citric acid, aloe vera, gelatin, methyl paraben should provide the following expected results:

- **Cleansing:** Effectively removes oils and dirt without stripping moisture.
- **Moisturizing:** Leaves hair soft, hydrated and shiny.
- **Scalp Health:** Soothes and maintains the scalp health with no irritation.
- **Stability:** Remains stable for several months under proper storage conditions
- **Safety:** Gentle enough for sensitive scalps with no irritation or allergic reaction.

By adhering to these evaluation parameters, you ensure the quality, safety and performance of your herbal shampoo making it suitable for consumer use.

REFERENCES:

1. Kumar et al. (2017) - "Herbal remedies for hair care: A review" (Journal of Cosmetics, Dermatological Sciences and Applications)
2. "Shampoo: Composition, Types, and Uses" (Journal of Pharmaceutical Sciences, 2016)
3. "The History of Shampoo" (Journal of Cosmetic Science, 2018)
4. "Cleansing Efficiency of Shampoos" (Journal of Cosmetic Dermatology, 2016)
5. "Shampoo Ingredients and Their Effects on Hair" (International Journal of Trichology, 2018)
6. "Phytochemicals in Hair Care: A Review" (Journal of Ethnopharmacology, 2017)
7. "Herbal Shampoos for Hair Growth: A Review" (International Journal of Trichology, 2019)
8. "Garlic: A Review of Its Medicinal Properties" (Journal of Ethnopharmacology, 2018)
9. "Spinacia oleracea (Spinach): A Review of Its Nutritional and Medicinal Properties" (Journal of Food Science, 2018)
10. "Pharmacological Effects of Flaxseed" (European Journal of Pharmacology, 2017)
11. "Sapindus Laurifolius (Reetha): A Review of Its Chemical and Pharmacological Properties" (Journal of Ethnopharmacology, 2018)
12. "Medicinal Uses of Curry Leaves" (Journal of Ayurveda and Integrative Medicine, 2019)
13. "Aloe barbadensis (Aloe vera): A Review of Its Pharmacological and Therapeutic Properties" (Journal of Ethnopharmacology, 2018)
14. "Maceration Method for Extraction of Plant Compounds" (Journal of Pharmacognosy, 2015)
15. "Formulation of Herbal Shampoo" (Journal of Cosmetic Science, 2020)
16. "Evaluation of Herbal Shampoo" (Journal of Pharmacognosy, 2020)