International Journal of Pharmaceutical Research and Applications
Volume 10, Issue 4 July-Aug 2025, pp: 706-715 www.ijprajournal.com ISSN: 2456-4494

A Reviw Pepar -Formulation and Evaluation of Herbal Shampoo

Astha gupta[1*], Arya Gupta[2], Priya Tiwari[3]
Author: Ruchi Verma
1. Seiko college of Pharmacy Lucknow
2. Assistant Professor Seiko college of Pharmacy

Date of Submission: 01-08-2025 Date of Acceptance: 10-08-2025

ABSTRACT
The aim of the present study was to formulate and evaluate a herbal shampoo containing natural ingredients, with a focus on safety and efficacy, to minimize the risks associated with chemical- based shampoos. The primary objective was to eliminate harmful synthetic components from shampoo formulations and replace them with safe, natural alternatives. This study attempted to integrate modern formulation techniques into a shampoo developed with natural ingredients. The resulting product effectively cleanses sebum, dirt, and dandruff, promotes hair growth, strengthens the hair, and enhances its natural color. Additionally, it serves as a conditioning agent without causing any damage to the hair. The shampoo was formulated using extracts of Aloe vera, Hibiscus rosa-sinensis, Phyllanthus emblica, Acacia concinna, Azadirachta indica, Sapindusmukorossi, Glycyrrhizaglabra, and Ecliptaprostrata. Organoleptic, physicochemical, and performance evaluations were conducted. The results demonstrated that this herbal formulation could serve as aviable and effective alternative for cleansing and maintaining hair health, reducing the reliance on synthetic substances. The findings highlight that synthetic chemicals often lead to adverse effects in consumers. This research confirmed the successful development of an herbal shampoo using natural ingredients. All the components used in the formulation were found to be safe, and the physicochemical evaluation indicated optimal results.

I. INTRODUCTION

Herbal Cosmetics:-The word "Cosmetics" originates from Greek word "KOSMETICOS" which means skilled in arranging or adornment. The term originally referred to any substance or practices used for beautifying body or enhancing appearance.

Herbal Cosmetics are beauty or personal care products formulated using natural ingredients derived from Plants, Herbs, Flowers, Fruits, and other Botanical source.

These products are often being promoted as they are free from Synthetics chemicals, preservatives and artificial fragrance, appealing to consumers seeking more natural and environmentally friendly alternatives. Herbal cosmetics can include a wide range of products such as Creams, Lotions, Shampoo, Conditioners Etc.All having the beneficial properties of Botanical extract for skin care, hair care and all beauty enhancement.

The objective of this project is to develop a herbal shampoo that promotes hair growth, enhances strength, smoothens, adds shine, and restores natural hair color without causing any damage. For this purpose, ingredients such as Amla, Reetha, Shikakai, Hibiscus, and Neem leaves were selected for the formulation of the herbal shampoo. These ingredients were chosen based on traditional knowledge. The herbal shampoo is designed to cleanse the hair while also conditioning, smoothening, and maintaining scalp and hair health, effectively preventing dandruff. Additionally, it is expected to possess antibacterial and antimicrobial properties. These antimicrobial agents play a significant role in combating infectious diseases. Based on the findings, we observed several beneficial properties of the herbal shampoo, and further efforts will focus on optimizing its use as a cosmetic product for human application.

Herbal medicine is the study of pharmacognosy and the application of medicinal herbs as a foundation for traditional medicine. Chemical formulations developed by many companies aim to treat various hair-related problems; however, they may also cause hair damage and inhibit hair growth.

Herbal shampoo is a cosmetic product formulated with plant-based herbs and is intended for cleansing the hair and scalp, similar to conventional shampoos. According to global studies, certain chemical ingredients in

International Journal of Pharmaceutical Research and Applications
Volume 10, Issue 4 July-Aug 2025, pp: 706-715 www.ijprajournal.com ISSN: 2456-4494

conventional shampoos have been associated with carcinogenic risks. Synthetic surfactants are commonly included for their cleansing and foaming properties; however, long-term use may result in adverse effects such as eye irritation, scalp sensitivity, hairloss, and dryness. Therefore, herbal shampoos are a preferable alternative, as they tend to produce fewer side effects. These formulations can enhance hair strength, promote smoothness and growth, add shine, and help reduce hair loss.

HERBAL SHAMPOO

IDEAL PROPERTIES OF HERBAL SHAMPOO

- To make hair silky, smooth and shiny.
- It should be non-irritate the scalp, skin, eye.
- It also gives hair growth.
- It should have anti-bacterial and anti-microbials properties and also gives a cooling effect.
- It also prevents the hair dryness.
- It should effectively and thoroughly remove dirt and impurities.
- Make a substantial amount of foam.
- It should have chemical free. hence it decreases the chances of hair losses.

BENEFITS OF HERBAL SHAMPOO

- It should thoroughly cleanse the hair.
- It should effectively remove the dirt.
- It should produce an adequate amount of foam.
- It should be easily rinsed off with water.
- It should not cause any side effects or discomfort to the eyes or skin.

Advantages:

- Made from Pure and organic ingredients.
- Free from side effects.
- Contain No surfactant.
- Free from synthetic additives.
- Safe for the skin.

Disadvantages:

- Potential for inconsistency in quality due to natural variations in plant extracts.
- Difficulty achieving a strong lather compared to synthetic shampoos.
- Potential for allergic reactions to certain herbs.
- Less effective for heavily styled or oily hair may not be suitable for all hair types.
- Can be more expensive than conventional shampoos.
- Herbal shampoos often produce less foam compared to synthetic shampoos, which can make it feel like the hair isn't being thoroughly cleaned.
- Some individuals may experience skin irritation or allergic reactions to specific herbs used in the shampoo.
- Depending on the formulation, herbal shampoos may not be effective for very oily or heavily styled hair.

II. MATERIAL AND METHOD

INGREDIENTS:

BIOLOGICAL SOURCE	CONSTITUENTS	FAMILY	USE
Hibiscus leaves	Dried leaves of Hibiscus rosea	Malvaceae	Preventhairloss and growth promoter.
Neem leaves	Dried leaves of Azadirachta indica	Meliaceae	Prevent the dryness of hairs and flaking of hairs, antimicrobialagent.
Amla fruit	Dried ripefruits of Emblica officinalis.	Euphorbiaceae	Darkening of hair and hair growth promoter.
Aloevera	Dried latex of aloeleaves.	Asphodelaceae	Conditioner and moisturizing effect.

International Journal of Pharmaceutical Research and Applications
Volume 10, Issue 4 July-Aug 2025, pp: 706-715 www.ijprajournal.com ISSN: 2456-4494

Shikakai fruit	Dried pods of Acaciaconcinna.	Fabaceae	Foam base and antidandruff.
Reetha fruit	Driedfruits of Sprindusmukorossi.	Sapindaceae	Detergent, foaming property andante dandruff.
Peppermint powder	Dried leaves of Menthapiperita.	Lamiaceae	Antimicrobial activity, prevent hair loss, cooling effect.
Xanthumgum	Xanthomonas campestris	hydrocolloid	Gelling agent.
Distilled water	-	-	Vehicle

HIBISCUS LEAVES
Family: Malvaceae
Biological source: Dried leaves of **Hibiscusrosea**
Uses:

- Hibiscus is also known as china rose. This flower generally used in the formulation of shampoo because it stimulates hair growth. It contains amino acid which produce special kind of structural proteins called "Keratin", which work as building blocks for hair.
- It also provides some useful nutrients like Vitamin C, flavonoid, amino acid, mucilage fiber, antioxidant etc….,all this promote hair growth and reduce hair loss. Hibiscus also maintain the shining and smoothness of our hair, it also control the fizziness of our hair and also repair our hair by reducing split ends.
- It contain antioxidant which help to stop the oxidation process to protect hair from different harmful environments factor. It has flavonoids which accelerate the growth of hair, vitamin helps build collagen which is most important for hair growth, where as amino acid boost hair health by preventing breakage and encouraging growth and fibers help to reduce hair loss, reduce the chances of dandruff and even helps regulate sebum production which causes oily hair. Hibiscus has all this property that's why it is the most important ingredient used in herbal shampoo.

HIBISCUS LEAVES

NEEM LEAVES
Family: Meliaceae
Biological source: The biological source of Neem is the **Azadirachta indica** tree, which is native to the Indian subcontinent and parts of Southeast Asia

USES:

- Neem is a common ingredient in herbal shampoo. Because it promotes the hair growth. Neem leaves contain quercet in and ß-sitosterol, which contain anti-bacterial and anti- microbial properties which provide protection from fungus that causes dandruff. It also promotes hair growth and cleanses and strengthens hair follicles, which can lead healthier hair.
- It also contains Flavonoids, tannin, phenols, saponin, azadirachtin and gallic acid and also contain vitamin E. All these chemicals constituent are found in neem that promotes the hairlosses and also reduce the dandruff in the scalp. It also provides hair strengthen and prevent the hair damage.
- In neem, tannin and flavonoid are present that plays an important role in formulation of herbal shampoo because it promotes the antifungal activities, as well as it also contains anti inflammation activity. It also increases the blood circulation in the scalp and make hair smooth and also remove the dryness of hair.
- Neem is a rich source of Vitamin E which help repair damaged skin cells.

NEEM LEAVES

International Journal of Pharmaceutical Research and Applications
Volume 10, Issue 4 July-Aug 2025, pp: 706-715 www.ijprajournal.com ISSN: 2456-4494

AMLA FRUIT
FAMILY: Euphor biaceae
Biological source: This consists of dried, as well as fresh fruits of the plant.
Emblica officinalis Gaerth (Phyllanthusemblica Linn.)
Uses:

- AMLA play an important role in formulation of herbal shampoo. It is used in lots of shampoo and conditioner owing to its rich in antioxidants and iron content. It also contains vitamin C which help to reduce hair fall.
- It contains ascorbic acid, tannin, flavonoids, alkaloid and fatty acid …. etc. all these chemicals constituent is mainly responsible for the hair protection and make them smooth and shinning and increase the hair growth.
- Amla contains antioxidants can help fight oxidative stress, which can lead to premature graying. Amla can work as a natural conditioner, leaving hair soft and smooth. Applying Amla oil into the scalp can boost blood circulation. Antibacterial properties of Amla help fight dandruff because they also contain anti-fungal and Anti-bacterial as well as anti-microbial properties. So, the people can easily use in day-to-day life because they have no side effects.
- Hence, it's main ingredient in the formulation of herbal shampoo.

AMLA FRUIT

ALOEVERA
FAMILY: Asphodelaceae
BIOLOGICAL SOURCE: Driedlatex of **Aloe Vera leaves.**

USES:

- AloeVera is important ingredient that are used in the formulation of herbal shampoo. It is generally responsible for their smoothening and moisturizing effect. It is also used to prevent hair damage and hair loss and also provide hair growth due to which hair become long and silky and dandruff free scalp.
- People can use AloeVera gelin day-to-day life because it's showing no side effect.. so people can be use easily applied in the hair. It is also controlling the fizziness of our hair and also repair our hair, reducing by split ends. It also controls the hair damage and free from bacterial and microbial effects.
- It contains flavonoid, tannins, anti-oxidative and amino acids…et call these chemicals' agents are responsible for different – different activities or effects. An Anti-oxidative contain antioxidant which help to stop the oxidation process to protect hair from different harmful environmental factors. The flavonoid is also present in Aloe Vera which is responsible for preventing the hair damage and hair losses.

ALOEVERA

SHIKAKAI FRUITS
FAMILY: Fabaceae
BIOLOGICAL SOURCE: Driedpods of **Acaciaconcinna.**
USES:

- Shikakai is most important ingredient that are used in the herbal shampoos and formulation of herbal shampoo because it is responsible for Foam base andanti dandruff properties in the herbal shampoo. It is also used to remove dirt from the scalp and also provide protection from environmental factors.
- It is responsible for hair growth, and it should be also providing nourishment to the hair because of them the growth of hair will be increases. It should also prevent the hair damage and hair losses. Shikakai can make hair softer, shinier, and thicker.
- Shikakai can help prevent splitends. Shikakai may help slowdown hair graying .Shikakai is used in many shampoos and conditions for its

International Journal of Pharmaceutical Research and Applications
Volume 10, Issue 4 July-Aug 2025, pp: 706-715 www.ijprajournal.com ISSN: 2456-4494

rich content of saponin. This natural foaming that prevents the hair losses and hair damage and increase the hair growth.

SHIKAKAI

REETHA FRUIT
FAMILY: Sapindaceae
BIOLOGICAL SOURCE: Driedfruits of **Saprindusmukorossi.**
USES:

- REETHA is responsible for the production of foam and for anti-foaming effects, so it used in herbal shampoo for foam production in the shampoo. It should also contain detergency effect which remove dirt from the scalp and also prevent and remove dandruff from the scalp. So, it also contains anti dandruff properties to.
- It is generally used as a cleaning and production of foam in the shampoo. It should have no side effects that is why it is used in herbal shampoo preparation. It also contains sugar and saponin…. etc. Saponins are used in India to make natural hair cleansers. They can help clear dirt, dust, and oil from hair, promote hair growth, and balance excess oil on the scalp.
- Reethai soften mixed with other ingredients like Amla, Shikakai, henna, or coconut oil to promote deep conditioning and hydration.
- Hence it is important ingredient that are used in the formulation of herbal shampoo.

REETHA FRUIT

PEPPERMINT OIL
FAMILY: Lamiaceae
BIOLOGICAL SOURCE: Menthapiperitais as terile hybrid of water mint (Menthaaquatica) and spearmint (Menthaspicata).
Uses:

- Peppermint oil is a common ingredient in shampoos and conditioners because of its pleasant scent, and it is also used in herbal shampoo for their cooling effect. It is also providing protection from hair losses and contain anti-bacterial and anti-microbial properties that is why it is generally used in the herbal preparation.
- Peppermint oil can help with scalp dryness, itching, and other scalp problems. It has anti-inflammatory properties that can reduce redness and irritation. Peppermint oil can help reduce hair loss and promote hair growth. The menthol present in peppermint oil improves blood circulation to the scalp, which may stimulate hair growth.
- Peppermint contains a compound called menthol, which is responsible for many of its beneficial effects. Menthol provides peppermint with its distinctive taste, smell, and cooling sensation. It also gives the scalp a refreshing feel and a tingling sensation, contributing to a soothing experience during application.
- That is why we can use peppermint oil in the formulation of herbal shampoo**.**

International Journal of Pharmaceutical Research and Applications
Volume 10, Issue 4 July-Aug 2025, pp: 706-715 www.ijprajournal.com ISSN: 2456-4494

PEPPERMINT OIL

XANTHUM GUM
FAMILY: hydrocolloidfamily
BIOLOGICAL SOURCE: Derived from the bacterium **Xanthomonascampestris.**

Uses:

- Xanthan gum is a natural thickener and stabilizer that plays several roles in herbal shampoos, including:
- Xanthan gum can thicken shampoos even at low concentrations. It provides a smooth, silky texture and helps hold ingredients together.
- In medicated shampoos, xanthan gum suspends insoluble particles like pigments and other active ingredient
- Xanthan gum is stable in both alkaline and acidic conditions, and it has excellent thermal stability.
- Xanthan gum prevents water-oil separation and boosts protein stability.
- Xanthan gum is a polysaccharide derived from the fermentation of sugars from corn, soy, or wheat. It's also used in other personal care products and in food. It is also used as a binding agent in the formulation of herbal shampoo hence it is also increasing the viscosity of shampoo and works as a thickening agent.

XANTHUM GUM

DISTILLED WATER: It is used to maintain the quantity of the herbal preparation.

COMPOSITION AND METHODOLOGY
COMPOSITION :

SR.NO	INGREDIENT AND EXCIPIENTS	QUANTITY(20ml)
1.	HIBISCUS LEAVES	1g
2.	NEEM LEAVES	1g
3.	AMLAFRUIT	2g
4.	ALOEVERA	1ml
5.	SHIKAKAI	3g
6.	REETHA	3g
7.	PEPPERMINTOIL	0.1ml
8.	XANTHUMGUM	0.2g
9.	DISTILLEDWATER	Q.S.

Method:-
Extraction and Decoction method:- Extraction: - Soxhlet extraction

- Soxhlet extraction is a hot extraction method.
- It is generally used to extract the chemical constituents from plant leaves and parts of plants.
- It is generally done into the Soxhletapparatus.
- Before, performing the experiment firstly take leaf of Neem and hibiscus and washed it properly and dry it properly.
- After the drying, grind the leaves properly in grinder and convert into small particles.
- The mixture done separately.
- Then assembly should be fixed (this method is done in Soxhlet apparatus).
- Take20gmofeachdriedpowder in a thimble.
- And fixedit into the Soxhlet apparatus.
- Now, extraction will be started. Extract for 8hours at 60°C.
- Recover the solvent by distillation.(Hence methanol is used as a solvent).
- After the extraction weight the quantity of extracted solutions.

SOXHLET APPARATUS

International Journal of Pharmaceutical Research and Applications
Volume 10, Issue 4 July-Aug 2025, pp: 706-715 www.ijprajournal.com ISSN: 2456-4494

(Extraction of Neem) DECOCTION METHOD: -

- The decoction method is generally used to extract chemicals from plant material by continuously boiling it in water.
- In the decoction method, water is used as a solvent.
- In this process, plant leaves are boiled in a specific volume of water(1:4) for a set period.
- The mixtureis boiled until it reduces to half of its original volume(1/4).
- Now, cool the mixture.
- After cooling, filter the mixture, and collect the decoction as the final product.

DECOCTION

Procedure:-

Preparation and use of plant leaves in herbal shampoo.

- First, collect the neem and hibiscus leaves for preparing the herbal shampoo.
- Then, wash and dry both sets of leaves.
- Once dried, transfer the leaves into a grinder for grinding.
- After grinding, the leaves will be converted into a powder form.

Preparation of ingredients-

- The formula was used to accurately weigh all ingredients.
- One part of water was used to prepare a decoction of hibiscus, neem, amla, aloe vera gel, pippermint oil and fenugreek powder.
- A separate decoction was prepared using Shikakai and Reetha in another portion ofwater.
- Both solutions were filtered using a muslin cloth, and the filtrates were collected separately.
- Continuous stirring was applied to thoroughly mix the collected filtrates.
- Xanthan gum, which is semisolid in nature, was used as a thickening agent for the herbal shampoo.

EVALUATION TEST

To evaluate an herbal shampoo, various tests can be performed to ensure it meets safety, efficacy, and quality standards. Here's a comprehensive outline of the evaluation tests typically used:

- **Organoleptic Evaluation**
- **Appearance**: Check for color, clarity, and consistency.
- **Odor:** Evaluate the fragrance to ensure it is pleasant and characteristic of the Herbal ingredients.
- **Texture:** Assess the feel and viscosity of the shampoo.

- **Physicochemical Analysis**
- pH Measurement: Ideal pH should be between 4.5 and 6.5(like scal ppH). Viscosity: Measure using a viscometer to ensure proper consistency.
- **Density:** Verify density to match specifications.
- **Surface Tension:** Test using astalagmometertogauge the cleansing efficacy.
- **Foaming ability:** 5 mL of shampoo was placed in a test tube, sealed, and shaken manually 10 times. After one minute, the total foam volume was measured. This foam test assesses both the quantity, and the stability of the foam produced.
- **Total Solids:** To determine solid content, a clean and dry evaporating dish was used. Three grams of herbal shampoo were added. The initial weight of the shampoo was recorded, and the dish was then placed in a hot air oven to evaporate the liquid content. Only the weight of the remaining solid shampoo was calculated.

1. **Microbiological Analysis**

- **Total Microbial Count:** Ensure bacterial and fungal counts are within permissible limits.
- **Pathogen Detection:**Test for harmful microbes like Staphylococcusaureus, Escherichia coli, Salmonella, and Candida albicans.

2. **Stability Testing**

- Accelerated Stability: Assess physical and

International Journal of Pharmaceutical Research and Applications
Volume 10, Issue 4 July-Aug 2025, pp: 706-715 www.ijprajournal.com ISSN: 2456-4494

chemical stability under different temperatures (e.g., 25°C, 40°C) and humidity conditions over time.
- Shelf-life Estimation: Determine the product's durability and expiration periods.

3. Performance Tests
- **Cleansing Efficiency:** Evaluate how effectively the shampoo removes oil and dirt.
- **Detergency Test:** Compare the cleansing power to a standard shampoo.
- **Conditioning Effect:** Assess softness, smoothness, and manage ability after use.

4. Safety and Toxicity Tests
- Skin Irritation Test: Perform patch testing on human volunteers or animal
- Model (following ethical guidelines) to check for irritation oral lergic reactions.
- **Eye Irritation Test:** Assess for potential irritation if the product comes in contact with eyes (following OECD guidelines).
- **Heavy Metal Analysis:**Check for contaminants like lead, mercury, and arsenic.

5. Phytochemical Analysis(for Herbal Ingredients)
- **QualitativeTests:**Identify the presence of phyto constituents.(e.g. Flavonoids, alkaloids, Saponins).
- **Quantitative Analysis:** Estimate the concentration of key bioactive compounds.

6. Foam Stability and Wetting Time
- Asses show long the foam remains stable after agitation.
- Measure the time taken for a fabric sample to sink in the solution(for wetting ability).

Foam ability Test

7. In-vivo and In-vitro Efficacy Tests
- **Hair Growth Studies:** Evaluate effects on hair growth rate and thickness (usually on animal models).
- **Anti-dandruff Activity:** Test efficacy against dandruff-causing microbes,like Malassezia furfur.
- **Anti-hair Fall Effect:** Assess reduction in hairfall during washing and combing.

8. Consumer Panel Testing
- Conduct user trials to get feedback on:
- Cleansing efficiency
- Fragrance
- Conditioning effect Ease of rinsing
- Overall satisfaction

9. Labeling Compliance
- Verify that all claims(e.g.,"100% herbal,""paraben-free") comply with regulations.
- Ensure the ingredient list follows labeling standards.
- These tests help ensure the herbal shampoo is safe, effective, and meets market standards.

10. Biological activities:
- The beneficial or harmful effects of a medicine on living organisms are referred to as biological activity or pharmacological activity in pharmacology. Biological activity describes a molecule's ability to produce a specific biological effect on a target.

III. CONCLUSION:

The goal of this research was to create an all-natural shampoo that could effectively compete with synthetic shampoos available on the market. The formulated shampoo was not only safer than chemical-based conditioning products but also significantly reduced hair loss and promoted hair growth.

We developed an herbal shampoo using plant extracts traditionally used in Asia for their hair- cleansing properties. Instead of using synthetic cationic conditioners, we incorporated natural extracts such as Shikakai, Neem, Aloe, Peppermint, Amla, and others to promote hair development and conditioning. Almond powder was used as a preservative to avoid the risks associated with synthetic chemical preservatives.

To maintain the desired pH level and enhance the antifungal and antibacterial efficacy of

International Journal of Pharmaceutical Research and Applications
Volume 10, Issue 4 July-Aug 2025, pp: 706-715 www.ijprajournal.com ISSN: 2456-4494

the herbal mixture, the pH of the shampoo was carefully adjusted. A physicochemical preservation method was used to avoid chemical preservatives, ensuring properties such as color, pH, eye irritation potential, dirt dispersion, foaming ability, and stability were all evaluated in the final formulation. This mixture can be considered a promising herbal shampoo. Based on the findings, the herbal formulation demonstrated satisfactory results.

FINAL PRODUCT

HERBAL SHAMPOO

REFERENCE

[1]. Priya D. Gaikwad, Kamini V. Mulay, Formulaton and evaluation of herbal shampoo, international journal of Science and research, Volume 9, issue 3, Pg. No. 29-31.

[2]. Khaloud Al Badi, Shah A. Khan, Formulation, evaluation and comparion of the the herbal shampoo with the Commercial shampoos, 2014, Pg No. 302-305.

[3]. Tanya Malpani, Manal iJeithliya, Formulation and evaluation of Pomegranate basd herbal shampoo, Journal of Pharmacognosy and Phytochemistry, 2020, Pg No. 14391444.

[4]. Mahenran Sekar, Formulation and evaluation of herbal shampoo containing rambutan leaves extract, International journal of pharma and bio sciences, Oct 2016, Pg No. 146151.

[5]. Ashwini Sukhdev Pundkar and Sujara P. Ingale, Formulaton and evaluation of herbal liquid shampoo, World Journal of pharmaceutical research,Volume 9, Issue 5,PgNo. 901-9011.

[6]. Pawan Maurya, Shashikant Maury, A review article on: herbal shampoo, May 2021, Volume 8, Issue 5, Pg No. 366-375.

[7]. Miss Shweta S. Patil, Mr. Yuvraj J Mane, Formulaton and evaluation of herbal shampoo powder, International Journal of advanced research, 2015, Volume 3, Issue 3, Pg No. 939-946.

[8]. Ali Heyam Saad, Rasoolbazigha Kadhim, Formulation and development of herbal shampoo from Ziziphus Spina leaves extract, International Journal of Research in Ayurveda & Pharmacy 2 ; 2011, Pg No. 1802-1806.

[9]. Revansiddappa M, Sharadha R, Abbulu K., Formulation and evaluation of herbal antidandruff shampoo, J Pharmacogn Phytochem, 2018 Pg No. 764-767.

[10]. Aghel N, Moghimipour B, Dana RA., Formulation of a herbal shampoo using total saponins of Acanthophyllum

[11]. Shinde PR, TatyaAU, Surana SJ., Formulation development and evaluation of herbal antidandruff shampoo, Int J Res Cosmet Sci. 2013, Volume 3, Pg No. 25-33.

[12]. Swaminathan D., Studies on the addition of activated charcoal in herbal shampoo. Chemical Technology, 2018, Volume 13 Pg No. 1-9.

[13]. Pooja A, Arun N, Maninder K. Shampoos based on synthetic ingredients vis-à-vis shampoos based on herbal Ingredients, A review, Int J Pharm Sci Rev Res. 2011, Volume 7, Pg No. 41-46.

[14]. Ashwini VJ, Dipak M, Daundekar A, Bhujbal N, Kshirsagar S. Hebal hair cosmetics An Overview, World J of Pharm Sci, 2018, Volume 6, Pg No. 144-152.

[15]. Yamani NS, Sudha, Jyotsna, Pratyusha K, Pratyusha J, Kartheeka, Formulation and evaluation of polyherbal Hair oil, J Pharmacogn Phyochem, 2018, Volume 7, Pg No. 3254-3256.

[16]. Viuda-Martos M, Fernandez-Lopez J, Perez-Alvarez JA. Pomegranate and its many functional components as Related to human health: A review, Comprehensive Reviews in Food Science and Food safety, 2010, Volume 9, Pg No. 635-654.

[17]. Arora R, Rathore KS, Bharakatiya M. Formulation and evaluation of herbal shampoo by extract of some plants, The Pharmaceutical and Chemical Journal, 2019,Volume6, Pg No. 74-80.
[18]. Dash GK, Razak A. Formulation and evaluation of a herbal shampoo. IndoAmJPharm Sci. 2017, Volume 4, Pg No. 2860-2865.