

Biosynthesis And New Technique For The Formulation Of Hair Growth Shampoo

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ABSTRACT:

Presently the entire world is endeavouring to return towards the natural herbal materials through it has a no some other side effects towards ailments. 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. Herbal shampoo (HS) is the only product which used for hair washing and also used for hair remedy on hair problem. In recent study herbal HS (HS) has remarkable properties toward hairs. In first section contain, herbal extract prepared by mixture of amla, hibiscus flower powder, shikakai, aloe vera, and some Ingredients. Herbal extract take an amla, hibiscus leaf powder, shikakai, all in dried form in a beaker. and sieve the powders obtained fine powder form. For their transparency add some apple cider vinegar in it, followed by mixing up to colour. In second section beaker contains SLS, citric acid, agar agar and sodium benzoate everyone followed by stirring gradually, Herb extract with apple cider vinegar is stir gradually due to avoid foaming. Preservative like sodium benzoate, . Pour an Aloe vera in it, , makeup with water in it for small proportion, increasing a thickness obtained product HS. The formed HS is thick brown in colour, with great foam producing ability and fluidity. The pH of HS is between 6-7 at 25°C RT, formed HS is acidic in nature which is good quality. Percentage of solid contents of HS is 0.05g after dry. The cleansing action of the formed HS is 15.1. Dirt dispersion of formed HS is light. In 1% of HS it gives 46ml froth. All these are these characters demonstrates that the herbal HS is high quality for usable in daily life.

INTRODUCTION:

(/ʃæm'puː/) is a hair care product, typically in the form of a viscous liquid, that is used for cleaning hair. Less commonly, shampoo is available in solid bar format. Shampoo is used by applying it to wet hair, massaging the product into the scalp, and then rinsing it out. Some users may follow a shampooing with the use of hair conditioner.

The typical reason of using shampoo is to remove the unwanted build-up of sebum in the hair without stripping out so much as to make hair unmanageable. Shampoo is generally made by combining a surfactant, most often sodium lauryl

sulphate or sodium laurate sulphate, with a co-surfactant, most often cocamidopropyl betaine in water. The sulphate ingredient acts as a surfactant, essentially heavy-duty soap that makes it easier to trap oil and grease.

All shampoo formulations contain a mixture of surfactants (synthetic or natural) as cleansing and foaming agents, excipients (viscosity-controlling agents, emollients, preservatives, etc.), and active ingredients (Breuer, 1981). Shampoo formulations must be medically safe for long-term usage. Various synthetic, herbal, medicated, and non-medicated shampoos are available in local market and it is necessary to measure their performance, quality, and effectiveness. The evaluation of

shampoos comprises quality control tests including visual assessment and measuring physicochemical controls such as pH, density, viscosity, surface tension, foam volume, and wetting ability. Therefore, this study aimed to evaluate several shampoos for normal hair available in local market in Riyadh, Saudi Arabia, based on control tests including visual assessment and measuring physicochemical controls such as pH, density, etc. were performed. Additionally, to analyse product quality, specific tests were conducted for shampoo formulations including determining dry residue and wetting ability, total surfactant activity, surface tension, and detergency tests.

Shampoos are complex formulations consisting of primary surfactants of the anionic type, mainly alkyl sulfates, as detergent and foaming agents; secondary surfactants to boost the lather and thicken the shampoo; additives for stability, conditioning, and aesthetic features, and ingredients to address specific problems, such as dandruff, dry and greasy hair. Ideally, a good shampoo should produce a voluminous lather and effectively cleanse the hair and scalp and should be easily rinsed out with water, leaving the hair soft, lustrous, and moisturized. The product should not adversely affect the scalp and hands or cause irritation to the eyes, particularly when children and baby formulations are considered. Formulations based on bio surfactants, particularly of the glycolipid and lip peptide types may feature such requirements. For instance, mild skin cleansing formulations containing glycolipid bio surfactants with hair cleansing claims have been patented [Aqueous hair and skin cleaning compositions comprising rhamnolipid and sophorolipid bio surfactants as shampoos, conditioners, shower gels, and body cleansers] or a copolymer and sulfosuccinate detergent and/or bio surfactant combination as mild baby shampoo and body wash were patented. Another patent involved cleaning compositions comprising bio surfactants with a foam. Shampoo is generally used by applying it to wet hair, massaging the product into the hair, and then rinsing it out thoroughly. While some consumers may follow a shampooing with the use of hair conditioner, there are still consumers who may only use shampoo as daily hair washing and conditioning product. Hair conditioning effects such as making hair smooth, soft, easy to comb, etc. are expected from a shampoo by these consumers at both wet hair and dry hair stages. Wet hair conditioning of shampoo is mainly delivered by a colloid structure called coacervate formed by cationic polymer and anionic surfactant in water. On the other hand, dry hair

conditioning is primarily the result of depositing silicones and conditioning oils on hair surface.

Coacervation is a unique type of electrostatically driven liquid-liquid phase separation, resulting from the association of oppositely charged ions. Coacervate formed during water dilution of shampoo while rinsing involves cationic polymers such as cationic cellulose or guar, and the anionic surfactants in shampoo. Anionic polymers such as Carbomer also can be used sometimes in addition to the anionic surfactants to enhance coacervate formation. Functioning as a cushion, the water-containing coacervates provide non-squeaky hair feel during rinsing and protect the wet hair from being damaged

Herbal Shampoo

Herbal shampoos are probably the most widely used cosmetic products for cleansing hairs and scalp in our daily life [1]. Herbal shampoos are the cosmetic preparations that with the use of traditional ayurvedic herbs are meant for cleansing the hair and scalp just like the regular shampoo. They are used for removal of oils, dandruff, dirt, environmental pollutions etc. Herbal shampoo is a type of cosmetic preparation that uses herbs from plants as an alternative to the synthetic shampoo available in the market. The herbal shampoo is important, as people nowadays prefer herbal products than chemical ones for they proved to enhance. The awareness and need for cosmetics with herbs are on the rise, primarily because it is believed that these products are safe and free from side effects

FORMULATION PARAMETERS:

- Viscous liquid
- Clear or opaque
- Containing 20% to 40% solids
- Ph 5.5
- Viscosities 500-1500 centipoise

FORMULATION INGREDIENTS

- Water
- Surfactants / foaming agents
- Ph adjusters
- Viscosity modifiers
- Sequestering agents
- Opacifiers
- Conditioning agents
- Antidandruff agents
- Perfumes

- Colours
- Preservatives

WATER:

This is the main ingredient in all shampoo preparations, comprising about 60-80% of the solution. It aids in diluting the cleaning agents, thereby reducing irritation. It makes the shampoo formula easier to spread on the hair and scalp.

Yes, the most abundant ingredient in shampoos is in fact, water! It makes up around 75-80% of the total formulation. Specially treated water, called deionized water, is used in shampoos. This water is made free from any dissolved ions or particles.

SUFACTANTS:

Surfactants are compounds that lower the interfacial tension of a between two phases. These are molecules that possess both hydrophilic and lipophilic moieties in their structure. they get adsorbed on the interface and helps the phases to miscible. The function of surfactants for such particulates is to enhance wetting and permit dispersion.

In this respect, surfactants achieve their purpose by lowering surface and interfacial tensions and by solubilizing oils and waxes. The effect known as surface tension is caused by an imbalance of intermolecular forces at the gas-liquid interface. Molecules in the bulk of liquids are attracted on all sides by their neighboring molecules. However, molecules at the surface are subjected to imbalanced forces; they are attracted by the underlying liquid molecules, but there is essentially no interaction with the vapor-gas molecules on the other side of the liquid-vapor boundary. This imbalance leads to a two-dimensional force at the surface, and this is surface tension

FOAMING AGENTS

These agents are used to introduce gas bubbles into the water. The foam, also known as lather, is important, as it functions to spread the detergent over the hair and scalp, but it does not participate in cleaning.

- It is true that a shampoo applied to dirty hair will not foam as much as the same shampoo applied to clean hair. This is due to the sebum inhibiting bubble formation. Thus, a shampoo will foam less on the first shampooing and more on the second shampooing.

pH Adjusters

These agents are used to prevent the hair shaft from alkalinization. Most detergents are having alkaline pH, which causes hair shaft swelling. This swelling loosens the protective cuticle predisposing the hair shaft to damage. The scalp pH is 5.5, and the hair shaft pH is 3.67. An alkaline pH may increase the negative electrical net charge of the hair fiber surface and, therefore, increase the friction between the fibers Example: Citric acid, Glycolic acid

THICKENING AGENTS

These agents are used shampoo thick and creamy. Thickening may be achieved by adding salts or gums. Gums improve viscosity because of their gel-like properties Eg: Tragacanth gum, Gum Karaya, Carboxymethylcellulose

SEQUESTERING AGENTS

These are the agents to chelate magnesium and calcium ions, present in hard water, preventing formation of insoluble soaps (scum). This scum film will make hairs look dull and may contribute to itching and symptoms of seborrheic dermatitis

OPACIFYING AGENTS

Chemical agents added to the preparation to make it opaque, so that light does not pass through. These are usually added to give pearly shine, which offers no improved cleansing. It provides only optical effect. Eg: Spermaceti, Alkanolamines of higher fatty acids, propylene glycol, Mg, Ca and Zn salts of stearic acid etc

CONDITIONING AGENTS

The conditioner functions to impart manageability, gloss, and antistatic properties to the hair. These are usually fatty alcohols, fatty esters, vegetable oils, mineral oils, or humectants. Commonly used conditioning substances include hydrolyzed animal protein, glycerin, dimethicone, simethicone, polyvinylpyrrolidone, propylene glycol etc. • Protein-derived substances are popular conditioners for damaged hair, as they can temporarily mend split ends. Split ends arise when the protective cuticle has been lost from the distal hair shaft and the exposed cortex splits. The protein-derived substances holds the cortex fragments together until the next shampooing occurs

ANTI DANDRUFF AGENTS

Medicated shampoos contain small amount of these actives, which are in contact with the scalp for only a short time. In order to be effective the active ingredient must work in the oil-water environment of the scalp and must be readily substantive to the scalp for continuing activity. • Ex: Selenium sulphide, zinc pyrithone, salicylic acid.

PERFUMES

Shampoos include perfumes that are mostly concentrated. Example: Fruit fragrance

COLOURS

Used to impart colour, different colours are used.

PRESERVATIVES

Shampoo formula containing water has the potential to be contaminated by pathogens. For this reason it is essential to include preservatives among shampoo ingredients, to prevent the growth of moulds. Preservatives usually comprise only 0.1 – 0.5% of the formulation

Sodium benzoate

Sodium Benzoate is used as a **preservative** to prevent food from molding. It helps keep our products shelf-stable for at least two years from the date of purchase and is used in concentrations of less than 0.5% by volume. Like food and drink products, cosmetics also need preservatives to prevent the growth of bacteria. Preservative-free, natural products cannot be stored for a long time. Sodium benzoate can also be used in pharmaceutical products for its antimicrobial properties, such as in the formulation of tablets, capsules, and cough syrup.

Hibiscus flower powder

The botanical name of hibiscus is *Hibiscus rosasinensis* it also helps:

- Stops hair loss
- Make hair lustrous and healthy
- Prevent premature graying
- Thicken hair and add volume
- Treat dandruff
- Prevents split ends

It nourishes and conditions hair while restoring the elasticity of strands, thus reducing hair fall. Hibiscus benefits hair by naturally sealing the

moisture on the shafts of hair and making it smooth and silky. Protection from external damage: Hibiscus has resilient properties that protect the scalp and hair from UV rays. Using hibiscus powder on hair also prevents frizziness, split ends and hair fall.

The flowers and leaves of the hibiscus have essential nutrients and amino acids that enhance blood circulation to the hair follicles. They trigger keratin formation and encourage hair growth.

Aloe vera

The botanical name of aloe vera is *aloe barbadensis*

- Deep cleans oily hair
- Strengthen and repair hair strands
- Promote hair growth
- Anti-inflammatory action
- Moisturising effect
- It suits for all types of hair

It also soothes the scalp and conditions hair it can reduce dandruff and unblock hair follicles that may be blocked by excess oil. Aloe vera penetrates deeply into the scalp pores and revitalizes healthy tissue then the plant natural amino acids work to cleanse the scalp and bring impurities to the surface.

Aloe vera mainly works on damaged hair so well for this purpose because it has the ability

Amla powder

Botanical name of amla is *Phyllanthus emblica*

- Condition your scalp
- Promotes healthy hair
- Minimizes grays
- Boost volume
- Reduce dandruff
- Treat head lice
- Amla is rich in vit -c it can help skin cells regenerate

Amlas also contain vitamin c, amla powder for hair is a wonderful choice if you want to heal split ends. amlas are also great at preventing breakage and increasing elasticity, amla can help your hair grow back healthier as well! Amla will naturally balance the pH of your scalp which means that it's not going to strip out any natural oils from your scalp or locks. Amla is also known to remove excess build-up which will lead to healthier hair/scalp, amla powder for hair can be used as a dry shampoo if you need it!

Citric acid

citric acid is often used in shampoo formulation to bring the pH levels down which improves the hair's appearance and manageability by reducing fizz it can also be used in rinses to help lift or fade colour out of the hair this have much higher more alkaline pH levels this helps keep hair at healthy pH levels

The citric acid in shampoos also increases blood circulation to the scalp, which is very useful for strengthening and repairing hair follicles. This acid, while controlling the production of excess sebum, does not inhibit the function of the sebaceous glands and thus maintains the natural fat of the hair and scalp. Therefore, using products containing it will make your hair stronger, thicker, shinier, and generally healthier. However, sometimes the high concentration of citric acid in shampoos can damage the hair, as it opens the hair cuticles. At the same time, it can remove valuable minerals from the hair and whiten the hair.

Shikai powder

Natural shampoo alternatives are becoming popular these days, as people are turning to a more natural, greener lifestyle and 'no-poo' options. I had never heard of shikakai powder, so before using it, I spent some time researching it. Pronounced 'she-ka-KAI' (which sounds like a lyric from a Shakira song), it comes from the Acacia Concinna tree, a climbing shrub native to Asia. However, it is very common in India and is traditionally used there as a shampoo. The fruit pods, leaves and bark are dried and then ground into a powder which is referred to as shikakai powder which translates as 'hair fruit'

Stearyl alcohol

This is one of the most commonly found lubricating ingredients in shampoos, silicone-free conditioners, creams, shower gels, body butter, hair masks, crack creams, etc

Sodium lauryl sulphate

Sodium lauryl sulfate ($C_{12}H_{25}SO_4Na$) is a surface-active agent used in cleaning and cosmetic products. It is also known by the term sodium dodecyl sulfate. It is used in industrial strength degreasers, floor cleaners, bubble bath and toothpastes. In the pharmaceutical industry, it has been used as an excipient in dissolvable dosage forms.

Agar agar

Agar-agar, known as just agar in culinary circles, is a plant-based gelatin derived from seaweed. The white and semi translucent vegetable gelatin is sold in flake, powder, bar, and strand form, and can be used in recipes as a stabilizing and thickening agent.

Apple cider vinegar

Unfiltered raw apple cider vinegar (ACV) is an excellent natural hair treatment. It is cleansing, gives the hair more body and luster and can reduce hair-loss. Washing your hair with ACV reduces itchy scalp and dandruff by destroying the bacteria and/or fungi that clog hair follicles. Apple cider vinegar rinse can also add shine to your hair and prevent split ends.

Many times harsh soaps and shampoos can strip hair and skin of their natural oils, leaving them dry. But rinsing your hair with apple cider vinegar is a great treatment for your hair and scalp.

Fragrance and water

A fragrance is a chemical mixture that has a smell or odour - but it is so much more besides, encompassing cultural, historical, social, economic and emotional value. Fragrances are the fusion of science and art: where chemists become creators, and where molecules make memories. Fragrances are unique Fragrance are the fusion of science and art where chemist become creators and where molecules make memories fragrances are unique where there are designed with care passion and ingenuity

EVALUATION TESTS FOR THE SHAMPOOS

Evaluation of herbal shampoo

The prepared formulation was evaluated for product performance which includes organoleptic characters, pH, physicochemical properties characterization, and for solid content. To guarantee the nature of the items, particular tests were performed for surface tension, foam volume, foam stability, and wetting time using standard protocol

Visual assessment:

The prepared formulation was assessed for color, clarity, odor, and froth

pH determination

The pH of the prepared herbal shampoo in distilled water (10% v/v) was evaluated by means of pH analyzer at room temperature

Determination of solid content percentage

The percentage of solid substance was determined by weighing about 4 g of shampoo in a dry, clean, and evaporating dish. To confirm the result, the procedure was repeated again. The liquid portion of the shampoo was evaporated in a dish by placing on hot plate. The percentage and the weight of the solid contents present in the shampoo were calculated after drying completely

Surface tension measurement

The prepared shampoo in distilled water (10% w/v) was evaluated for surface tension using stalagmometer in room temperature

Testing of wetting time

Wetting time was calculated by noting the time required by the canvas paper to sink completely. A canvas paper weighing 0.44 g was cut into a disc of diameter measuring 1-inch. Over the shampoo (1% v/v) surface, the canvas paper disc was kept and the time taken for the paper to sink was measured using the stopwatch

Foam stability test

The stability of the foam was determined using cylinder shake method. About 50 ml of formulated shampoo (1%) solution was taken in a graduated cylinder of 250 ml capacity and shaken for 10 times vigorously. Foam stability was measured by recording the foam volume of shake test after 1 min and 4 min, respectively [15]. The total foam volume was measured after 1 min of shaking.

Dirt dispersion test

To 10 ml of refined water two drops of cleanser were included and taken in a wide-mouthed test tube. To the formulated shampoo, added one drop of Indian ink and shaken for 10 min after closing the test tube with a stopper. The volume of ink in the froth was measured and the result was graded in terms of none, slight, medium, or heavy

Physical appearance:

As any other herbal cosmetic products, the attractiveness of shampoos for consumers tends to be judged visually, thus having good physical appearance is important. Formulated shampoo was opaque and brown in colour. It has a good odour given by the fragrance in the ingredients and also a good foam producing ability. The formulated shampoo was observed to be significantly different with synthetic shampoo in terms of color and transparency

Results and discussion:

Evaluation of herbal shampoo:

To evaluate the prepared formulations, quality control tests including organoleptic and physicochemical characterization such as pH, solid contents and viscosity were performed. As well to ensure the quality of the products, specific tests for shampoo formulations including: surface tension, foam volume and foam stability, detergency, eye irritation, skin sensitization tests and preliminary stability study were also carried out. The results were compared with frequently used marketed herbal shampoo considered as reference.

Physical appearance/visual inspection

All samples were observed for their physical appearance/visual inspection. The prepared formulations were evaluated in terms of their clarity, foam producing ability and fluidity. Determination of pH The pH of shampoo solution (10% w/v) in distilled water was determined at room Temperature

Detergency and cleaning action

5gm sample of solid human hair is placed at 35°C in 200cc of water containing of 1gm of shampoo. The flask is shaken 50 times a minute for 4 minute. Then washed once again with sufficient amount of water, then after filter the hair dried and weighed. The amount of soil removed under this condition is calculated

Conditioning action:

Conditioning action the degree of conditioning given to hair is ultimately judged by shampoo user who is making the evaluation on the basis of past experience.

Foam, foam stability

Cylinder shake method was used for determining foaming ability 50ml of the 1% shampoo solution was put into a 250 ml graduate cylinder and cover the cylinder with hand and shaken for 10 times. The total volume of the foam contents after 1 minute shaking were recorded .the foam volume was calculated .foam should retain atleast 5 min

Viscosity

Viscosity of liquid shampoo is determined using "Ostwald Viscometer" Product viscosity plays an important role in defining and controlling many attributes such as shelf life stability and product aesthetics such as clarity ease of flow on removal from packing and spreading on application to hair and product consistency in the package. The flow characteristics of non-Newtonian materials are usually not measured with a single data point, because their viscosity is dependent on the shear rate. The best approach is to take multipoint measurements approximate to those of the process being modelled. Indicates that shampoos are low viscosity products, whose viscosity remains almost unchanged over the range of r.p.m used. Shampoo shows pseudo plastic behaviour the same as the commercial one (reference), which is a desirable attribute in a shampoo formulation. At a low r.p.m., these shampoos show high viscosity. On increasing the shear, the viscosity

Surface tension measurement:

Measurements were carried out with a 10% shampoo dilution in distilled water at room temperature. Thoroughly clean the stalagmometer using chronic acid and purified water because surface tension is highly affected with grease or other lubricants. The data calculated by following equation given bellow:

$$R_2 = \frac{(W_3 - W_2) n_1}{(W_2 - w_2) n_2} \times R_1$$

Where

W1 is weight of empty beaker.

W2 is weight of beaker with distilled water.

W3 is Weight of beaker with shampoo solution.

n1 is no. of drops of distilled water.

n2 is no. of drops of shampoo solution.

R1 is surface tension of distilled water at room temperature.

R2 is surface tension of shampoo solution

https://www.researchgate.net/publication/258567387_Evaluation_Of_Standards_Of_Some_Selected_Shampoo_Preparation

Skin irritation test

Applied the solution of prepared shampoo on skin and kept for 5 min and observed for redness of skin and irritation there, were no any red coloration and the irritation to the skin

Dirt dispersion

Two drops of shampoo were added in a large test tube contain 10 ml of distilled water. 1 drop of India ink was added; the test tube was stopper and shakes it ten times. The amount of ink in the foam was estimated as None, Light, Moderate, or Heavy. Ossify drops, which would allow ease of spreading on the hair

Determination of percentage solid content

A clean dry evaporating dish was weighed and added 4 grams of shampoo to the evaporating dish. The dish and shampoo was weighed. The exact weight of the shampoo was calculated only and put the evaporating dish with shampoo was placed on the hot plate until the liquid portion was evaporated. The weight of the shampoo only (solids) after drying was calculated.

If a shampoo has too many solids it will be hard to work into the hair or too hard to wash out. If it doesn't have enough it will be too watery and wash away quickly. A good shampoo will be between 20% – 30% solids

Wetting time

A canvas paper was cut into 1-inch diameter discs having an average weight of 0.44 g. The smooth surface of disc was placed on the surface of 1% v/v shampoo solution and the stopwatch started. The time required for the disc to begin to sink was noted down as the wetting time

Result

Physiochemical evaluation of formulated herbal shampoo

parameter	result
Colour	brown
Transparency	clear
Odour	good
pH	7.0
Foam producing ability	yes
%of solid contents	23.0%
Foam volume	85ml
Foam type	medium,dense,uniform
Foam stability and uniform	good
viscosity	30,000

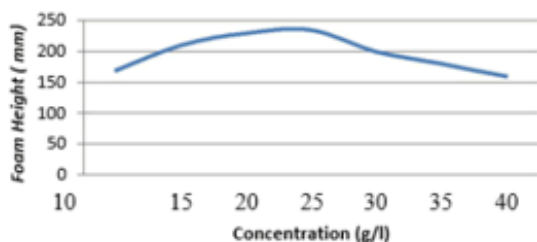


Fig 3. Foam height vs. concentration

Evaluation of formulation for physical appearance

Sr.no	Trails	Physical appearance
1	Trail 1	Dark brown
2	Trail 2	Dark brown
3	Trail 3	Dark brown

Determination of PH:

Sr.no	Trail	pH
1	Trail 1	5.53
2	Trail 2	5.01
3	Trail 3	5.63

Determine % of solid contents

Sr.no	Trails	Solid contents
1	Trail 1	20.12
2	Trail 2	24.63
3	Trail 3	26.67

Viscosity of herbal shampoo

Sr.no	Trails	viscosity
1	T1	1.17
2	T2	1.23
3	T3	1.26

Cleaning action

Sr.no	Trails	Cleaning action
1	T1	31.18
2	T2	29.03
3	T3	31.23

Surface tension (dynes /cm)

Sr	Trails	Surface tension
1	T1	32.08
2	T2	32.21
3	T3	32.31

Surface Tensi Detergency ability

Sr. no	Trails	Detergency (%)
1	T1	65.55
2	T2	63.07
3	T3	63.21

Foam stability

Sr.no	Trails	Foam volume (ml)
1	T1	169
2	T2	165
3	T3	163

Stability study of herbal shampoo

Sr.no	parameters	2 weeks	4 weeks	8weeks
1	Physical appearance and visual inspection	clear	clear	clear
2	PH	5	5.2	5.5
3	Solid contents	20.41	23.15	24.78
4	Surface tension measurements (dy./cm)	31.77	30.60	34.56
5	Rheological evaluations (cps)	1.18	1.20	1.25
6	Detergency ability (%)	62.17	65.21	52.88
7	Foaming ability and foam stability	167	173	167



Ph of the shampoo

CONCLUSION

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 extract 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 Table 3: Physicochemical study of the herbal shampoo Evaluation test Formulated shampoo Color Brown Transparency Clear Odor Good pH of 10% solution 7 Solid contents (%)23.25Foam volume (ml)25Foam type dense, small Surface tension (dynes/cm)35.18Wetting time (s)120 stable 4: Conditioning performance of formulated shampoo Score Formulated shampooControl11162443120430Average31.1The mean score based on the opinion given by the volunteers from student population (n=20) on the conditioning effect of the shampoos on the selected tresses. Score 1 - poor, Score 2 - fair, Score 3 - good, and Score 4 - excellent

Reference

- [1]. Mainkar AR, Jolly CI. Formulation of natural shampoos. *Int J Cosmet Sci* .
- [2]. Aghel N, Moghimipour B, Dana RA. Formulation of a herbal shampoo using total saponins of *Acanthophyllum squarrosum*. *Iran J Pharm Res*.
- [3]. Potluri A, Asma SS, Rallapally N, Durrivel S, Harish GA. Review on herbs used in anti-dandruff shampoo and its evaluation parameters. *Indo Am J Pharm Res*.
- [4]. Shinde PR, Tatiya AU, Surana SJ. Formulation development and evaluation of herbal antidandruff shampoo. *Int J Res Cosmet Sci* .
- [5]. Firthouse PU. Effects of *Ocimum sanctum* and *Azadiracta indica* on the formulation of antidandruff herbal shampoo powder. *Der Pharm Lett* .
- [6]. 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*
- [7]. Kapoor VP. Herbal cosmetics for skin and hair care. *Nat Prod Radiance*.
- [8]. Khushboo PS, Jadhav VM, Kadam VJ, Sathe NS. *Psoralea corylifolia* Linn.-"Kushtanashini". *Pharmacogn Rev* .
- [9]. Srivasuki KP. Nutritional and health care benefits of amla. *J Pharm* .
- [10]. Roy RK, Thakur M, Dixit VK. Hair growth promoting activity of *Eclipta alba* in male albino rats. *Arch Dermatol Res*.
- [11]. Tarun J, Susan J, Suria J, Susan VJ, Criton S. Evaluation of pH of bathing soaps and shampoos for skin and hair care. *Indian J Dermatol*.
- [12]. Badi KA, Khan SA. Formulation, evaluation and comparison of the herbal shampoo with the commercial shampoo. *Beni-Suef Univ J Basic Appl Sci* .
- [13]. Gaud RS, Gupta GD. *Practical Physical Pharmacy*. 1st ed. New Delhi: C.B.S. Publisher and Distributer;
- [14]. Mainkar AR, Jolly CI. Evaluation of commercial herbal shampoos. *Int J Cosmet Sci* .
- [15]. Klein K. Evaluation of shampoo foam. *Cosmet Toilet Mag* .
- [16]. Ali HS, Kadhim RB. Formulation and evaluation of herbal shampoo from *Ziziphus spina* leaves extract. *Int J Res Appl Pharm*
- [17]. Boonme P, Pakpayat N, Yotmanee K, Kunlawijitrungrsee S, Maneenuan D. Evaluation of shampoos containing silicone quaternary microemulsion. *J App Pharm Sci* .
- [18]. Baran R, Maibah HI. *Cosmetic dermatology in children*. In: *Text Book of Cosmetic Dermatology*. 2nd ed. London: CRC Press; .
- [19]. Ireland S, Carlino K, Gould L, Frazier F, Haycock P, Ilton S, et al. Shampoo after craniotomy: A pilot study. *Can J Neurosci Nurs*
- [20]. Sarath C, Vipin KV, Ann RA, Lindumul KV, Arun S. Development and evaluation of antidandruff shampoo based on natural sources. *J Pharm Phytother*.
- [21]. Teltscher, Kate (2000). "The Shampooing Surgeon and the Persian Prince: Two Indians in Early Nineteenth-century Britain". *Interventions: International Journal of Postcolonial Studies*. 2 (3): 409–23
- [22]. ChemViews (2012). "Shampoo Science". ChemViews.
- [23]. *American Heritage Dictionary of the English Language*, 4th Edition, See Shampoo; Also see Shampoo. Hobson-Jobson (1903), University of Chicago.
- [24]. Robbins, Clarence R., *Chemical and physical behavior of human hair*, 4th ed (Springer Verlag: New York) 2002. www.ijcrt.org © 2020 IJCRT | Volume 8, Issue 9 September 2020 | ISSN: 2320-2882 IJCRT2009364 International Journal of Creative Research Thoughts (IJCRT) www.ijcrt.org 2869
- [25]. *The World of Hair, A Scientific Companion* by Dr. John Gray, Macmillan Press Limited, 1977, pp. 23–24.
- [26]. Gitanjali, Deokar; Prajakta, Pethkar; Swati, Bakshe; Kiran, Erande; Rajendra, Bhambar (15 July 2014). "Antimalassezia Activity of Medicated Antidandruff Shampoo Formulated with Microwave Dried Garlic Powder with Improved Allucin Stability". *The Natural Products Journal*.
- [27]. Method for shampooing a pet using a foam-dispensed pet shampoo composition", issued 1997-04-23 28. Some of the information is collected from the college