



A REVIEW ON: FORMULATION AND EVALUATION OF HERBAL ANTI-DANDRUFF SHAMPOO

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ABSTRACT:- Shampoo is a hair care solution used to remove oils, filth, skin debris, dandruff, environmental pollutants, and other fungal impurities from the hair. Other impurities that eventually accumulate in hair. It is a cosmetic product, and its main use is to rid the hair of built-up sebum, scalp impurities, and grooming product residues. The clinical condition known as dandruff, which is brought on by *Malassezia* (*Pittosporum*) species, is a major aesthetic concern around the globe. Dandruff is a well-known as Anti-dandruff shampoos contain fungistatic agents that regulate the condition. The major goal of this study was to replace harmful synthetic components in the formulation of anti-dandruff shampoo with safe natural ingredients. In an effort to create a recipe based on natural substances, current formulation technology has been included. Shampoo was prepared with *Sida cordifolia* leaf extract and soap nut and shikakai were used as surfactants. Evaluation of organoleptic properties, physicochemical and performance test were performed and compared with synthetic marketed product. The result indicated that formulation LF had properties which were at par in comparison with an established marketed brand of synthetic anti-dandruff shampoo. Anti-dandruff, shampoo, synthetic, natural *Sida cordifolia* leaf extract was used to make shampoo, and soap nut and shikakai were utilised as surfactants. Analysis of Organoleptic, physicochemical, and performance tests were conducted and compared with commercially available synthetic product. The outcome showed that formulation LF exhibited characteristics that were comparable to those of an established synthetic anti-dandruff shampoo with a popular brand.

Keywords: Shampoo, natural, synthetic, anti-dandruff.

Introduction:- Shampoo is a cosmetic product that is packaged in an easy-to-use form and intended for washing hair and scalp. Its main purpose is to rid the hair of built-up sebum. Scalp impurities and hair-care product remnants (B.M. Mithal, 1994; Shobha Rani, R.Hiremath, 2008). Hence, the According to the World Health Organization, herbal remedies 80% of the world's population, mostly in poor countries for basic medical care. This approach of plant-based traditional medicine is still crucial to healthcare (V P) Kunda B. Patkar (2008), and Kapoor (2005). *Sida cordifolia* (Malvaceae Family), also called Bala (Sanskrit) is an herb that is often employed as a basic herbal remedy. Therapeutic substance on the Indian subcontinent. The common people use it.

Shampoos are likely the most often used cosmetic items in daily life to clean our hair and scalp. Herbal shampoos are classified as cosmetic preparations and are primarily used for washing the hair and scalp with the use of traditional Ayurvedic herbs. They are mostly used to remove oils, dandruff, debris, and other environmental irritants from your hair while also nourishing it. is an alternative to commercially available synthetic shampoo, herbal shampoo uses herbs from plants.

The use of herbal shampoo is growing in popularity as people prefer them to chemical products these days because of the side effects that chemicals might have. Herbal shampoo has been shown to improve hair health without causing any negative side effects. As a result, demand for and awareness of herbal-infused cosmetics are growing because it is believed that these products are risk-free and without negative side effects.

The cosmetic items that we use most frequently to clean our hair and scalp on a regular basis are probably shampoos. Herbal shampoos, which are categorised as cosmetic products, are primarily used to wash the hair and scalp using age-old Ayurvedic herbs. The majority of the time, they are utilised to nourish your hair while also cleaning it of oils, dandruff, debris, and other environmental irritants. Herbal shampoo uses plant-based herbs as an alternative to synthetic shampoo that is sold commercially.

Hair grows from the fat layer of the scalp's hair follicles. The base of each hair follicle has a hair bulb, which is where the growth of hair occurs. Hair follicles receive nutrition from blood vessels found within the dermis. To produce the hair shaft, the cells proliferate and replicate. The hair keeps its flexible structure as it continues to develop beneath the skin. As it passes through the skin, its outer layer becomes keratin and hardens.

The table provides a summary of the developed formulation's composition. *Emblica officinalis* aqueous decoction was separated into two portions. The components were combined. Guar gum, stabiliser, and flax seed were stirred into the mixture. Aqueous *Emblica officinalis* decoction was used to fill out the volume of the shampoo formulation after filtering. A suitable container was employed to keep and test the developed shampoo. The chemical composition of the developed formulation is summarised in the table, which shows how shampoo is made. Two components of the aqueous decoction of *Emblica officinalis* were separated. An herbal extract was blended with the first portion, but the second portion wasn't.

- The requirement for comprehensive and thorough removal of dirt and other greasy materials, and hair octopus cells.
- The need for a sizable amount of foam to be produced to meet the user's psychological requirements.
- Keep your hair dry, shiny, silky, and manageable.
- Do not have any adverse side effects. Avoid breaking or roughening your hands.

Shampoo that contains an anti-dandruff chemical and is primarily used to prevent or treat dandruff on the scalp of the hair is known as anti-dandruff shampoo. There are two different kinds of anti-dandruff shampoos on the market.

A. Shampoos made of synthetic chemicals that are designed to fight dandruff.

These formulations include anti-dandruff compounds that are used therapeutically and are divided into three types:-

1. Fungicidal compounds, such as imidazoles and zinc pyrithione
2. Cytostatic agents and selenium sulphide
3. Keratolytic chemicals, such as sulphur compounds and salicylic acid.

B. Plant-based, herbal shampoos that fight dandruff.

Anti-dandruff shampoos made from herbal substances, such as plant extracts and essential oils, are cosmetic products. These herbal shampoos are typically used to treat dandruff, add natural colour to hair, remove excess oil from hair, promote healthy hair development, remove dirt, debris, and scales from the scalp, stop hair loss, and add softness and smoothness.

Foaming in shampoo is required for customer approval even if it is not a measure of cleaning action.

While certain non-ionic cleaners produce little to no foam, they do very well in terms of cleaning. Foams that are good wetting agents typically aren't stable.

Action of wetting was initially created to evaluate goods intended to help with cotton fabric and yarn dyeing. Although there is no connection between shampooing and dyeing cotton yarn or fabric, this test can be performed to examine wetting action.

Oral toxicity can be expressed in terms of its 50-fold fatal dosage, or the amount of the substance needed to kill half of the test animal. Rats are generally employed in this test. Animals in fasting cages are taken, and dosage is carried out with the aid of a stomach tube. The more toxicity, the lower the LD/50.

Chemical shampoos may appear to be enhancing hair structure along the length of the hair, but they ultimately damage the roots and result in:

- Scalp dryness and itching
- Early greying and ageing of the hair
- Split ends and excessive hair loss.

The best solution for all of these issues is to switch to herbal shampoo, which will restore lost nutrients and undo any harm done.

Herbal cosmetics are becoming more popular, as there is a growing belief that they are risk-free and have no negative side effects. Many product natural claims continue to be heavily reliant on artificial functional ingredients.

Classification of shampoo :-

1. Based on Appearance

- **Powder shampoo:-** Dry shampoo is a solution that removes oil, filth, and dirt from your scalp without having to wash it. It's frequently used to revive hair after exercise, to prolong the life of a blowout, etc. It can also be helpful for those with impairments who struggle to take showers on their own.
- **Liquid shampoo or lotion shampoo:-** With the exception of some waterless solid forms like a bar, shampoo is normally in the form of a viscous liquid.
- **Gel shampoo -** Shampoo is used to treat skin diseases that cause the scalp to become scaly and itchy, such psoriasis, seborrheic dermatitis, or dandruff. Related Article. Symptoms, causes, and remedies for dandruff.
- **Cream shampoo:-** Due of their plastic consistency and aesthetic appeal, many users choose cream shampoos or cream paste shampoos, which are thickened and made opaque by suspended particles

2. Based on Use or Function

- **Conditioning shampoo:-** A conditioning shampoo offers all the same benefits as a regular shampoo, including cleaning the hair by eliminating dust, debris, and pollutants. However, it also contains additional conditioner-type substances that help to make hair smoother and more manageable than it would be without the conditioner. A common scalp condition called dandruff affects about half of postpubertal people of all racial and gender identities. Since the time of the Greeks, through Sabouraud's age in the late nineteenth century, and up until the present, the precise nature and aetiology of dandruff have been a source of debate.

According to Herrera-Arellano et al. (2004), 25% of all scalp conditions are caused by dandruff. According to Selden (2005), it affects roughly 15–20% of the population overall and more than 50% of adults (Ro and Dawson).

Numerous substances have been demonstrated to reduce dandruff. Ketoconazole and other imidazole derivatives, as well as additional substances like selenium sulphide, zinc pyrithione, piroctone olamine, ciproxirolamine, etc., are the key active components.

- **Antidandruff shampoo:-** In order to reduce flaking and itching, buildup, and excessive sebum production in your scalp, dandruff shampoo contains antifungal and antibacterial substances including ciclopirox and zinc pyrithione.

- **Therapeutic shampoo:-** Dandruff and other scaly, itchy skin disorders (such as psoriasis or seborrheic dermatitis) are treated with this drug applied to the hair or scalp debris, dandruff, environmental pollutants, and other contaminant particles that gradually build up in hair. It is specifically formulated for use on infants and young children by substituting chemicals that are allegedly less irritating to the eyes than those typically found in regular shampoo.

- **Balancing shampoo:-** A shampoo's claim to be pH-balanced indicates that the maker determined the ideal pH range for the product to operate at. The pH of the shampoo is measured while it is being created to ensure that it is within the desired range.

3. **Based on origin:**

- **Herbal shampoo:-** Shampoos impregnated with natural component extracts are known as herbal shampoos. These shampoos produce the best and most durable results, which is their best quality. These shampoos don't harm the hair and don't include any harsh ingredients.

- **Egg shampoo:-** A natural shampoo prepared from whisked eggs is called egg shampoo. Eggs are a powerful and healthy alternative to chemical hair washing since they include protein, vitamins, and emulsifiers that dissolve oil. Eggs can also be used to condition and hydrate hair.

HAIR ANATOMY:-The hair follicles on the scalp's fat layer are where hair grows. Contrary to popular assumption, hair follicles actually produce groups of 1-4 hairs known as "follicular units" instead of individual strands. Each hair follicle has a hair bulb at the base, which is where the process of creating hair grows. Blood vessels located within the dermis provide nutrients for hair follicles. The cells multiply and grow to create the hair shaft. While the hair is still growing under the epidermis, it maintains its supple shape. Its outer layer hardens to keratin as it moves through the epidermis.

PARTS OF HAIR:-

- **Dermal papillae:-**The dermal papillae, which is similarly made up of androgen receptors that are sensitive to the presence of DHT, is in charge of controlling the hair cycle and hair development.
- **Matrix:-** The matrix, which contains all the active cells for growth and for the development of the various elements of the hair, especially the outer root sheath, the inner root sheath, and the hair shaft, surrounds the dermal papillae required for hair. The matrix and dermal papillae work together to form the hair bulb.
- **Outer root sheath:-** The outermost region of the hair is the keratinized outer root sheath, or tricholemma. It provides the hair follicle with an opening from which to emerge by covering the entire hair follicle inside the dermis and moving through to the epidermis.
- **Inner root sheath:-** The Henley layer, Huxley layer, and cuticle make up the three layers that make up the inner root sheath. In order to stabilise the hair, the Henley's and Huxley's layers, which are capsular layers, attach onto one another. The deepest layer closest to the hair shaft, known as the cuticle, is formed of hardened, dead cells and provides further protection for the hair shaft. This binds the hair and permits it to lengthen, along with the capsular layers that make up the Henley's and Huxley's layers.
- **Hair shaft:-** The only portion of the hair follicle to totally escape the skin's surface is the hair shaft. The medulla, cortex, and cuticle are the three layers that make up the hair shaft.

The innermost part of the hair shaft is said to include the medulla, a disorganised and irregular region that is not always present.

The internal root sheath of the hair is connected to the cuticle, which is its external layer of protection. It is an intricate structure with a single lipid molecule layer that aids in the water-repellency of hair.

HAIR PHYSIOLOGY:-

Anagen (growth phase): The majority of hair grows at all times. Each hair stays in this phase for a number of years.

Catagen (transitional phase): Over a few weeks, the hair follicle shrinks and hair growth slows.

Telogen (resting phase): The goal is to stabilise the hair over several months. The cuticle, which is the deepest layer closest to the hair shaft, is formed of hardened, dead cells and provides further protection for the hair shaft. This secures the hair, enables it to cease growing, and causes the old hair to fall out of the hair follicle, together with the capsular layers that make up the Henley's and Huxley's layers. The growth phase of a new hair begins, pushing the old hair out.

Ideal properties of herbal shampoo:-The necessity to thoroughly and completely remove dust and grease and other oily materials.

- A significant volume of foam must be produced to satisfy the user's psychological needs.
- Rinsing with water makes it simple to remove.
- Avoid splashing and keep your hair dry, lustrous, silky, and manageable.
- It should impart a pleasing sheen to your hair.
- Do not irritate the skin or eyes, nor do they have any negative side effects.
- Do not crack or roughen your hands.
- Low toxicity.
- Slightly acidity .
- Bio degradable and earth friendly.
- Lowers risk of side effect.
- The shampoo is not tested on animals.
- Pleasant fragrance.
- No synthetic additives.

Advantages of herbal shampoo:-

- Herbal shampoos are environmentally friendly and biodegradable.
- It doesn't irritate the eyes at all.
- It is reasonably priced and cost-friendly.
- Herbal shampoo can work wonders for your hair when used frequently.
- By utilising herbal shampoo, one can attain the ideal oil balance.
- They have natural necessary disinfecting characteristics that shield the hair and scalp from the sun's damaging UV rays.

Disadvantages of herbal shampoo:-

- There may be temporary hair loss, skin irritation, dry skin, oily or dry hair/scalp, or other problems.
- Consult your doctor or chemist right away and stop using the medication if any of these side effects persist or get worse.
- The risk of hair darkening is present, although it can be minimised by properly rinsing the hair after each treatment.

Evaluation parameter of herbal shampoo:-

Appearance:- The prepared product's clarity, colour, odour, and foaming capacity were assess.

Foaming stability:- After shaking for one minute, the total volume of foam was measured. The foam's volume is merely calculated. The amount of foam shake was measured immediately after shaking and every minute thereafter for four minutes.

PH:- Take some PH paper, and set it down on a white tile. Using a clean pipette, drop a sample onto the PH paper. Pay attention to the PH paper's colour. now Make a note of the PH value and compare the colour obtained on the PH paper to another shade of the standard colour PH card.

Percentage of solids:- A clean, dry evaporating dish containing 4 grammes of shampoo was used for the experiment. To ensure the precise weight of the shampoos, they were weighed once again. The liquid part of the shampoo was evaporated in an evaporating dish on a hot plate. The weight percentage was then calculated.

Skin irritation:- Applying a small bit of shampoo to the skin can reveal whether or not irritates the skin. Check for any localised inflammation or irritation after a short while.

Visual examination and physical appearance:- Clarity, colour, and odour of developed formulations were assessed. There were reports and discussions of every evaluation. Ph measurement A 10% concentration sample was prepared by diluting the developed formulation with distilled water. A digital pH metre was used to measure the pH of the prepared sample at 30^oC room temperature.

Calculating the percentage of solids contained Weighing a piece of dry, clean China, we added 4 grammes of shampoo. The shampoo-filled dish was weighed. The shampoo's precise weight was determined. Until the liquid component of the shampoo had evaporated, the China dish with shampoo was placed on the hot plate. After drying, the weight was calculated.

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Viscosity measurement:- Using the Brookfield Viscometer LVDV Prime-I, the viscosity of the shampoo was ascertained. At room temperature, or 30^oC, the viscosity of shampoo was measured using various rpm and torque.

Measurement of surface tension:- Shampoo should be diluted with distilled water to a 10% concentration. Stalagmometer was used to take measurements. Stalagmometer's flat end should be dipped into a beaker of samples.

Surface tension calculation:- Shampoo should be diluted with distilled water to a 10% concentration. Stalagmometer was used to take measurements. Dip Suck developed shampoo samples into a beaker using the flattened end of the stalagmometer until the level reaches the desired level mark.

At the stand, correct it, and let the sample run slowly in the target. Count how many droplets were produced when the level of A to B is reached via fluids. Try it once more with distilled water. The following equation was used to calculate the data.

W1 is the beaker's empty weight. With distilled water, a beaker's weight is W2.

Weight of beaker containing shampoo solution is W3.

N1 is the number of distilled water droplets.

Stability of foam and its capacity to foam:-For testing foaming ability, a slightly modified version of the cylinder shake method was utilised. A 250 ml graduated measuring cylinder was filled with 50 ml of the 1% shampoo solution, and the cylinder was then hand-covered.

For one minute, the measuring cylinder was shaken. The complete amount of After shaking for one minute, the foam's contents were noted. Five minutes of the procedure were spent in progress.

METHOD AND MATERIALS

All plants were harvested from authorised herbal gardens after being recognised and verified by botanists. taken plant parts were handled and kept in a designated location. Extracts were made following approved protocols and tested for they for the detection of several phytochemical components by testing (Chukwu O.O.C et al., 2010; Sagar R and Dixit V K, 2005; Mali R et al., 2010) 2011; Rupeshkumar Ghagi et al., 2011; V. Subhadra devi et al., 2012;(2007) Sabahat Saeed and Perween Tariq. developed formulation for the evaluations indicated below, a product made from natural ingredients (LF) was put up against an established market product (MS). Observed outcomes Discussion of the study's subject took place throughout. How shampoo is made the developed formulation's composition. Aqueous decoction of *Emblica officinalis* was divided into 2 parts. First part was added with herbal extract and second part was used to mix powders of soap nut and shikakai. Both parts were mixed. To the mixture flax seed, guar gum and stabilizer were added with stirring. Shampoo formulation was filtered and made up to the volume using aqueous decoction of *Emblica officinalis*. Developed shampoo was stored in a suitable container and used for further evaluations. How shampoo is made the table provides a summary of the developed formulation's chemical makeup. *Emblica officinalis* aqueous decoction was separated into two portions. The first portion was mixed with an herbal extract, while the second portion was used to combine soap nut and shikakai powders. The components were combined. Guar gum, stabiliser, and flax seed were stirred into the mixture. Aqueous *Emblica officinalis* decoction was used to filter and make up the volume of the shampoo formulation. The developed shampoo was kept put to use for additional tests.

TABLE:- Herbs used in treatment of dandruff

Plants	Common name	Family	Plant part used	remarks (pattern of using botanicals)	Figure
<i>Eclipta alba</i>	Bhringraj, false daisy	Asteraceae	-	Petroleum ether extract of <i>Eclipta alba</i> can be used	
<i>Hibiscus rosa-sinensis</i>	Gurhal	Malvaceae	Flower	Latex obtained from ground flowers is applied on the head as anti-dandruff	
<i>Mentha piperita</i>	mint	Labiatae	-	-	

<i>Cinnamomum camphor</i>	Karpoor	Lauraceae	Oil		
<i>Zingiber officinalis</i>	Ginger	Zingiberaceae	Root extract	Root extract can be used for the treatment of dandruff	
<i>Aloe vera</i>	Aloe	Liliaceae	Juice	Juice can be applied Table 3: (Continued)	
<i>Acacia concinna</i>	Shikakai	Mimosaceae	Pods	Pod extract is used for hair cleansing and to control dandruff	

Future perspective

Due to the potential ill effects that chemicals may have, individuals are increasingly choosing to use herbal shampoo instead of chemical-based solutions. It has been demonstrated that utilising herbal shampoo can strengthen hair without having any unfavourable side effects. Because of the perception that herbal-infused cosmetics are risk-free and free of unfavourable side effects, demand for and knowledge of these products are rising. Shampoos are arguably the cosmetic products that we use the most frequently to regularly clean our hair and scalp. The main purpose of herbal shampoos, which fall under the cosmetic category, is to wash the hair and scalp using traditional Ayurvedic herbs. They are typically used to clean and nourish your hair at the same time.

CONCLUSION

Ingredients employed in this study have already been proven to be active and useful by both the scientific community and common consumers. The key problem was creating stable and functionally effective shampoo from these natural constituents, rather than the functionality of the elements themselves. The table includes a list of the ingredients, their common names, botanical names, the portions they are utilised in, and their categories. Thus, it could be beneficial to formulate shampoo with safer natural and naturally derived components. Main challenge lies in the area of standardizing the natural ingredients which may assure the batch to batch consistency of these products when produced in large scale. Shift towards nature does not mean to produce products by destroying existing nature. It will be essential to have a green revolution which may definitely help our society to survive healthier and long lasting. This world believes in the concept of green pharmacy or green cosmetics, hence there is a huge scope for shampoo developed from natural origin. But more radical approach in popularizing natural shampoo, with emphasis on safety and efficacy has to be done among the consumers. Further long term studies may be recommended to prove the safety, stability and efficacy of the formulation to make it suitable as a commercial product.

References:-

1. FS Brandt, A Cazzaniga, and M Hann. Cosmetics: Market analysis and current developments. 30:141-3, Semin Cutan Med Surg, 2011.
2. Lather V., Kumar V., Gupta M., Kaushik D., and Dureja H.
3. Cosmetic drugs are a new idea. 155. Indian Journal of Pharmacology, 2005.
4. Grace R. Cosmeceuticals: Skin-friendly food.
5. Nat Food Merchandiser 22:92-9 2002.
6. Cindrella L., Baskaran X., and Jeyachandran R. screening of four Indian medicinal herbs' phytochemical and antibacterial properties. Libyan Agric Res Centre Journal International 2010;1:30–16.
7. Preparation and characterization of various polyherbal formulation for assessing the effects of hair colourants. Tomer KA, Sethiya NK, Singh VI. 2009;1:93–7 Int J Pharm Science.
8. 6.A R Manikar and C I Jolly, "Formulation of natural shampoo," International Journal of Cosmic Science, vol. 23, 2001, pp. 59–62.
9. B. M. Mithal, "Text Book of Forensic Pharmacy (1994)" Vallabh Prakashan. Delhi, Chris the Limey (2010), Shampoo's cleaning power, www.pharmazone.com,21. Application of extracts of henna (Lawsoniainamis) leaves as a counter stain, Afr. J. Microbiol. Res, Vol. 5(21), pp. 3351-3356, Chukwu O.O.C, Odu C.E, Chukwu D. I, Hafiz N, Chidozie V. N, and Onyimba I. A, 2011.
10. Mali R. Rakesh, Kumar Ashok, Singh Atul Kumar and Talwar Amitabh, (2010), Formulation of herbal shampoos from Asparagus racemosus,Acaciaconcin, Sapindusmukorossi, Vol 4.

- PandeyShivanand,MeshyaNilam, D.Viral, (2010),Herbs play an important role in the field of cosmetics, Int J PharmTech Research,Vol.2 (1),pp no: 632-639.
11. Richa Madhu Sharma, Kinjal Shah and Janki Patel,(2011), Evaluation of prepared herbal shampoo formulations and to compare formulated shampoo with marketed shampoos, Int J Pharm Sci, Vol 3,pp no: 402-405 RupeshkumarGhagi, Surekha K. Satpute, Balu A.
 12. Chopade and Arun G. Banpurkar, (2011),Study of functional properties of Sapindusmukorossi as a potential biosurfactant, Int. J. Sci and Tech,Vol. 4, pp no. 5 SabahatSaeed and Perween Tariq, (2007),Antimicrobial activities of emblicaofficinalisand coriandrumsativumagainst gram positivebacteria and candida albican, Pak. J. Bot, vol 39(3): 913-917.
 13. ShobhaRani.R.Hiremath, (2008),“Text Book of Industrial Pharmacy” Orient Longman Pvt.Ltd, Chennai, pp no: 194-211, 182-193. Shweta K. Gediya, Rajan B. Mistry, Urvashi K. Patel, M. Blessy and Hitesh N. Jain,(2011), Herbal plants: used as cosmetics.
 14. Nat. Prod. Plant Resour, vol 1 (1), pp no: 24-32 Swati Deshmukh, Bindurani Kaushal and Shweta Ghode, (2012), Formulations and evaluation of herbal shampoo and comparative studies with herbal marketed shampoo, Int J Pharm Bio Sci; Vol 3(3), pp no: 638 - 645.
 15. Ternikar, S. G,Alagawadi, K. R., Ismail Pasha, Dwivedi, S, Mahammed Rafi and Sharma.T,(2010), Evaluation of antimicrobialand acute anti-inflammatory activity of Sida cordifolia Linn Seed Oil, J. Cell Tissue Research; Vol. 10(3), pp no: 2385-2388. Ternikar, S. G,Alagawadi, K. R., Ismail Pasha, Dwivedi, S, Mohammed Rafi and Sharma.T,(2010), Evaluation of antimicrobialand acute anti-inflammatory activity of Sida cordifolia ,Linn Seed Oil, J. Cell Tissue Research; Vol. 10(3), pp no: 2385-2388. V P Kapoor,(2005), Herbal cosmetics for skin and hair care, IntJ. Nat. Prod. Plant Resour, Vol 4(4), pp no: 306-314 V. Subhadradevi, K. Asokkumar, M. Uma Maheswari, A.T. Siva Shanmugam and R. Sankaranand,(2012), In vitro antioxidant activity of Vetiveriazizanioidesroot extract, Tanzania Journal of Health Research, 2, 12.
 17. Ternikar, S. G,Alagawadi, K. R., Ismail Pasha, Dwivedi, S, Mahammed Rafi and Sharma.T,(2010), Evaluation of antimicrobialand acute anti-inflammatory activity of Sida cordifolia Linn Seed Oil, J. Cell Tissue Research;Vol. 10(3), pp no: 2385-2388.
 18. Ternikar, S. G,Alagawadi, K. R., Ismail Pasha, Dwivedi, S, Mohammed Rafi and Sharma.T,(2010), Evaluation of antimicrobialand acute anti-inflammatory activity of Sida cordifolia ,Linn Seed Oil, J. Cell Tissue Research; Vol. 10(3), pp no: 2385-2388. V P Kapoor,(2005), Herbal cosmetics for skin and hair care, IntJ. Nat. Prod. Plant Resour, Vol 4(4), pp no: 306-314 V.
 19. Subhadradevi, K. Asokkumar, M. Uma Maheswari, A.T. Siva Shanmugam and R. Sankaranand,(2012), In vitro antioxidant activity of Vetiveriazizanioidesroot extract, Tanzania Journal of Health Research, 2, 12

20. Shuster S. The etiology of dandruff and the mode of action of therapeutic agents. *Br J Dermatol* 1984;111:235-42.
14. Agarwal U, Pande P, Patki PS, Mitra, SK. Evaluation of the clinical efficacy and safety of anti-dandruff hair cream in the treatment of dandruff. *Antiseptic* 2009;106:37-
21. 23. Rippon JW. *The Pathogenic Fungi and the Pathogenic Actinomycetes*. Medical Mycology. Vol. 2. Philadelphia, PA: Saunders Company; 1974. p. 565-94.
22. Ro BI, Dawson TL. The role of sebaceous gland activity and scalp microfloral metabolism in the etiology of seborrheic dermatitis and dandruff. *J Invest Dermatol Symp Proc* 2005;10:194-7.
23. Arndt KA, Hsu JT. *Manual of dermatologic therapeutics*. Philadelphia, PA: Lippincott Williams and Wilkins; 2007. p. 49-52.
24. Hay RJ, Graham-Brown, RA. Dandruff and seborrhoeic dermatitis: Causes and management. *Clin Exp Dermatol* 1997;22:2-6.
25. Kligman AM, Fulton JE, Plewig G. Topical Vitamin A acid in acne vulgaris. *Arch Dermatol* 1969;99:469-76.
26. Pierard R. *Civil religion Critically Revisited*. Kirchliche Zeitgeschichte. New York: ???; 1995. p. 203-.
27. Preethi PJ, Padmini K, Srikanth J, Lohita M, Swetha K, Rao PV. A review on herbal shampoo and its evaluation. *Asian J Pharm Anal* 2013;4:153-6.
28. Sharma PP. *Cosmetics-Formulation, Manufacturing and Quality control*. 3rd ed. Lucknow: Vandana Publications; 1998. p. 703.
29. Patidar K, Soni M, Bhatt H, Saini V, Kshirsagar MD. Herbal shampoo basic concept, formulation and market potential herbal shampoo: Basic concept, formulation and market potential. *Adv Res* 2014;4:673-4.
32. Zoya M, Bhikhu M, Gaurav S. Anti-dandruff activity of synthetic and herbal shampoos on dandruff causing isolate. *Malassezia*. *Int J Adv Res* 2016;2:80-5.
30. Pekamwar SS, Kalyankar TM, Jadhav AC. *Hibiscus rosa-sinensis*: A review on ornamental plant. *World J Pharm Pharma Sci* 2013;2:4719-27.
31. Chakkilam RK, Suneetha Y, Srikanth P. Review of *Lawsonia inermis*. *World J Pharm Sci* 2017;6:885-91.