

ANTI-DANDURUFF SHAMPOO FROM POLYHERBAL EXTRACT

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ABSTRACT

The aim of the present study is to formulate and evaluate herbal Anti-Dandruff shampoo containing natural ingredients with an emphasis on safety and efficacy. It clears dirt, dandruff, promotes hair growth, luster, strengthens and darkens the hair. The main objective is to study how to eliminate harmful synthetic ingredients from anti-dandruff shampoo formulation and substitute them with safe natural ingredients. An attempt has been made to combine modern formulation technology into a formula based on natural ingredients. The shampoo was prepared by taking the extracts of Gokhru Leaf Extract (*Tribulus terrestris*), Tulsi Extract (*Osmium sanctum*), Shikakai Extract (*Acacia concinna*), Reetha Extract (*Sapindus mukorossi*), Aloe Vera Extract (*Aloe barbadensis*), Lemon Juice (*Citrus lemon*), and Hibiscus (*Hibiscus rosa-sinensis*) in different proportions. Several physicochemical tests were performed for visual assessment, wetting time, pH, assurance of solid contents, surface tension, detergency, dirt dispersion, conditioning performance, foam stability. Herbal shampoos are shampoos infused with extracts of natural ingredients used to wash the hair and helps to control and reduce dandruff. The skin on our head produces a greasy liquid called sebum. It is made to spread over the entire head and protect the hair. Herbal shampoos are made from pure organic ingredients, contain no synthetic additives or surfactants, and have no side effects. Herbal shampoos for hair growth are formulated to strengthen the hair follicles by delivering essential oils and nutrients through the roots and hair follicles. It then stimulates the formation of new and healthy hair root and promotes healthy hair growth.

KEYWORD: hair growth, shampoos, Herbal, Natural.

INTRODUCTION

Hairs are the integral part of human beauty.

- Hair is a protein filament that grows from follicles on the dermis or skin.
- Scientific name of hair is pill or pilus.
- Hair is a component of the integumentary system and extends downward into the dermal layer where it sits in the hair follicle.
- The presence of hair is a primary differentiator of mammals as a unique class of organisms. In humans, it is a cherished and highly visible indicator of health, youth, and even class.
- It has a sensory function, protects from cold and UV radiation, and can have a significant psychological impact when its growth or structure is deranged.
- At a microscopic level, the variety in length, color, diameter, and cross-sectional shape of each hair creates the characteristic profiles seen across ethnic groups and among individuals.

Shampoos are probably the most widely used cosmetic

products for cleansing hairs and scalp in our daily life. Under cosmetic preparations, Herbal shampoos are mainly used for cleansing the hair and scalp with the use of traditional Ayurvedic herbs. They are mainly used for removal of oils, environmental pollutions, dandruff, dirt, etc. And nourish your hair smoothly. Herbal shampoo uses herbs from plants as an alternative to the synthetic shampoo found in the market. The herbal shampoo is becoming important, as people these days prefer herbal products than chemical as chemicals have side effects and also Herbal shampoo is proved to enhance hair health having no side effects, awareness and need for cosmetics with herbs are on the rise, because it is believed that these products are safe and free from side effects. Herbal formulations are preferred as alternative to synthetic shampoo but formulating cosmetics using completely natural raw material is a difficult task.

Dandruff is actually caused by microbes, is 100% natural, and is called *Malassezia*. *Malassezia* is a single strain of fungus found in all warm-blooded mammals and humans that causes dandruff, atopic

eczema/dermatitis, pityriasis, ringworm, seborrheic dermatitis, and folliculitis. The root cause of dandruff is the unicellular microorganism *Malassezia globosa*. It exists for each person Scalp. About 50% of people react negatively to the presence of this fungus, which causes dandruff. Natural oils are present in the scalp and are called sebum and are the fuel/food for the microbes that cause dandruff. *Malassezia* eats these oils and breaks them down into by-products, including Oleic acid. The formation of oleic acid is the starting point for dandruff.^[1] About 50% of the world's population is sensitive to oleic acid and suffers from dandruff. The body responds to the presence of oleic acid by increasing the rate of skin cell regeneration. This is an attempt to "reset" the irritant and the mechanism that triggers delamination. Your body's response to *Malassezia* and oleic acid is more than just a flake. Dandruff is the best drug that can restore from hair's dry skin, red leather of hair, red leather of hair, red leather of hair, hair of hair. Antidandruff shampoo is a complex formula because it includes a combination of surfactants, air Conditioners, hair softener and anti-part formulations.^[2] The pH of the product, the solubility of the asset and the precipitation

of the assets play an important role in dandruff Shampoos. A variety of antidandruff Dandruff preparations are widely used in various anti-dandruff preparations such as climbazole, zinc pyrithione, octopi ox, ketoconazole, selenium sulphide, coal tar, etc. Patients suffering from Dandruff problem. Many researchers have found that peppermint piperita oil has immediate dandruff relief as well as fewer/minimized side effects and has the potential to be exceptionally studied.^[3]

MAIN INGREDIENT OF HERBAL SHAMPOO: GOKHRU

Currently, herbal medicines have attained great preferences over chemical drug based medicines due to more economic, lesser side effects on health and easy availability. Gokhru is an important medicinal plant which is being used in preparation of formulations in pharmaceutical companies.

Gokhru is of two types i.e. Chhota Gokhru (*Tribulus terrestris*) and Bada Gokhru (*Pedaliium murex* L.).



Bada-Gokhru (*Pedaliium murex*)

Chhota-Gokhru (*Tribulus terrestris*)

Fig. 1: Gokharu Plant.

Tribulus terrestris belong to family zygophyllaceae commonly known as gokshur or gokhru. *Pedaliium murex* L. belongs to family Pedaliaceae is perhaps one of the most useful traditional medicinal plant in India. It is known by different names such as Large Caltrops, Bada Gokhru, Gokhru, Gokantaka, Kshourak, Brihata gokshur, Khaar-e-Khasak Khurd, etc. This plant is widely distributed in East Africa, Indonesia and India and within India, it occurs commonly in waste places in the Deccan Peninsula, particularly near the coast, river belts and other sandy areas. It is also found in Delhi, Southern Haryana, Rajasthan and Punjab.

Bada Gokhru (*Pedaliium murex* L.) is perhaps the most useful traditional medicinal plant in India. Each part of the neem tree has some medicinal property and is thus commercially exploitable.

Scientific Classification

Kingdom: Plantae, Plant

Phylum/Division: Magnoliophyta

Class: Magnoliopsida (Dicotyledonae)

Subclass: Lamiidae

Order: Caryophyllales

Family: Pedaliaceae

Genus: *Pedaliium*

Species: *P. murex* L.

Botanical plant description

It is a creeper that is about 2 to 3 feet long having branches spread all over, leaves are in pairs of 5 to 8 and is of irregular shape. Flowers are small and yellow colored. Fruits are round and possess 5 to 12 compartments and each compartment contains a seed. The seeds contain aromatic oil.

Roots are 4 to 5 inch long, brown in color and bear a sweet aroma. The plant flowers in early winters followed

by fruiting. *P. murex* L. is a succulent herb found near sea coast of south India and some tropical areas of India. It appears during the month of July – September. It grows luxuriously in fertile soils and crop land as a weed at temperatures of 25–30 degrees.

Chemical constituents

Fruit: Alkaloids 3.5%–5%, stable oil, aromatic oil, resins, glycosides, carbohydrates.

Stem: Saponins, Herman, phytosterols, tannins and carbohydrates.

Root: Reducing sugars, phenolic compounds, saponins, xanthoproteins, alkaloids, triterpenoids and flavonoids.

Leaves: Flavonoids, alkaloids, steroids, resins, saponins and proteins.

Phytochemical studies

Preliminary chemical examination of *P. murex* revealed presence of naturally occurring different chemical constituents. Whole plant is reported to contain medicinally important. Mainly fruits contain alkaloids (3.5%– 5%), stable oil, aromatic oil, resins, carbohydrates, saponins, glycosides, and Triterpenoids and also two important flavonoids like 2', 4', 5'-trihydroxy-5, 7-dimethoxy flavones and Triaccontanyl dotriacontanoate. The study on leaves reports some important flavonoids like dinatin and 7-glucuronide, diosmetin and its 7-glucuronide, pedaltin and pedalin. Alkaloids, steroids, resins, saponins and proteins are also reported. The root contained novel phenolic compounds like phenol, 2-(5, 6-dimethyl pyrazinyl) methyl. Saponins, phytosterols, tannins and carbohydrates were reported from stem. Quercetiin, dinatin, querimctrin and an unidentified di glycoside of quercetin were reported from the flower.^[7,8]

Geographical distribution

Found widely distributed warmer regions of the world, throughout in India, Sri Lanka, West Tibet Flowering mainly takes place in Rainy season; the month of collection is between October and November.

Range and habitat

Native to the Mediterranean region, TT is widespread throughout the world from latitudes 35°S to 47°N. It is distributed across warm temperate and tropical regions of southern Europe, Southern Asia, throughout Africa, New Zealand, and Australia.

Macroscopic characters of Gokhru

Color – Fresh and greenish to gray

Odor – Odorless

Size – 1.0 -1.5 cm

Shape – Fruits are globose, Consist of 5- 10 woody cocci, each with two pairs of hard and sharp divergent spines

Classification of Shampoo

1. Based on Appearance

- ✓ Powder shampoo
- ✓ Liquid shampoo or lotion shampoo
- ✓ Gel shampoo or Solid shampoo
- ✓ Cream shampoo
- ✓ Oil shampoo
- ✓ Miscellaneous anti dandruff shampoo or medicated shampoo

2. Based on Use or Function

- ✓ Conditioning shampoo
- ✓ Anti-Dandruff shampoo
- ✓ Therapeutic shampoo
- ✓ Baby shampoo
- ✓ Balancing shampoo
- ✓ Clarifying shampoo

3. Based on origin

- ✓ Herbal shampoo
- ✓ Egg shampoo

Descriptive Classification

❖ **Powder shampoo:** - It is available in the form of dry powder, initially it was prepared from dry soaps, but nowadays dry synthetic detergents are used for their preparation. Powder shampoo is prepared where addition of water or other solvent reduces the activity of the components, especially in case of medicated shampoo. Nowadays, these shampoos are not used due to the difficulty experienced in their application.

❖ **Liquid shampoo:** - These are clear liquid preparations that are most widely used. They are usually made by using detergent of low cloud point. Some of these shampoos may be transparent.

❖ **Cream shampoo:** - These are called as lotion shampoos which are modification of clear liquid cream shampoos. Solubilizing agents such as magnesium stearate is also used to dissolve the added opacifier.^[8,9,10]

❖ **Jelly shampoo:** - These are transparent and thick usually made by incorporating a gelling agent, (e.g., cellulose). There is great use in hair salons and beauty parlors. The principle ingredients detergent which can be used either alone or in combination with soap. By altering the proportion of detergent, gel of required consistency can be obtained. Addition of methyl cellulose to clear liquid shampoo and its subsequent thickening also gives rise to gel shampoo.

❖ **Aerosol shampoo:** - They are called aerosol shampoos because they are packed in aerosol containers. Their formulation, preparation and packing is complicated as an additional propellants included. The propellant added must be compatible and should not reduce the activity of shampooing ingredients. The container opening is provided with a valve. Shampoo comes out as foam when the valve is pressed. Hence also

called as foam type shampoo.

❖ **Keratin shampoo:** - When your shampoo (or any hair care product) is infused with keratin oil, you reap benefits that nourish and condition the hair. This helps it look shiny and smooth. It also helps to fight frizz, tame fly always, and protect against damaged by styling tools like a straightening iron or blow dryer.

❖ **Volumizing shampoo:** - Volumizing or volume shampoos make hair appear fuller, bouncier and fuller of body. It's more about the texture of the hair than the thickness of the hair strand. Instead volumizing shampoos should be lightweight enough to not weigh down your thus creating more body in the end.

❖ **Specialized shampoo:** - Specialty shampoos are marketed to people with dandruff, color- treated hair,

gluten or wheat allergies, an interest in using an organic product, infants and young children ("baby shampoo" is less irritating). Conditioner, anti-dandruff.

Hair Anatomy

Hair grows from the hair follicles in the fat layer of the scalp. Contrary to the general belief that hair grows as individual strands, hair follicles actually grow in groups of 1-4 hairs called "follicular units". At the base of each hair follicle is a hair bulb where the growth mechanism for producing hair occurs. Hair follicles get their nourishment from the blood vessels within the dermis. The cells divide and develop to produce the hair shaft. It keeps its soft shape while the hair is still developing under the epidermis. As it passes through the epidermis, its outer layer hardens to keratin.

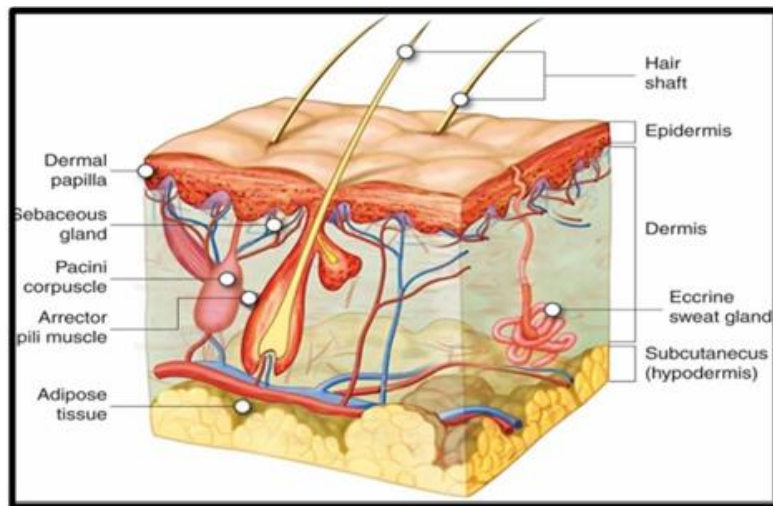


Fig. 2: Hair Anatomy.

Parts of Hair

Dermal papillae: The dermal papilla is responsible for regulating the hair cycle and hair growth, and is also comprised of androgen receptors that are sensitive to the presence of DHT.

Matrix: The matrix surrounds the dermal papillae needed for hair and contains all the active cells growth and for the development of the different parts of the hair, particularly the outer root sheath, the inner root sheath and the hair shaft. Combined, the matrix and the dermal papillae make up the hair bulb.

Outer root sheath: The outer root sheath, or trichilemmal, is the outermost part of the hair and is keratinized. It covers the entire hair follicle inside the dermis and then transitions through to the epidermis, providing the hair follicle with an opening from which to surface from.

Inner root sheath: inner root sheath is comprised of three parts: the Henley layer, Huxley layer, and cuticle.

The Henley's and Huxley's layers are capsular layers that anchor onto each other with the purpose of stabilizing the hair. The cuticle, which is the innermost part that is closest to the hair shaft, is made from dead hardened cells and give the hair shaft added protection. This, together with the capsular layers that make up the Henley's and Huxley's layers, secures the hair and allows it to grow in length.

Hair shaft: The hair shaft is the solitary part of the hair follicle that fully exits the surface of the skin. The hair shaft is made up of three layers: the medulla, cortex, and the cuticle.

- ❑ The medulla is described as an unsystematic and unstructured area located in the innermost region of the hair shaft and is not always present.
- ❑ The cortex, in contrast to the medulla, is highly structured and organized.
- ❑ The cortex is made up of keratin and is responsible for giving hair its strength and durability, as well as its water uptake. The cortex also contains melanin and determines the color of hair based on the

number, distribution and types of melanin granules present.

- The cuticle is the hair's outer protective layer and is connected to the internal root sheath. It is a complex structure with a single molecular layer of lipids that helps hair repel water.^[11,12]

Hair Physiology

Anagen (growth phase): Most hair is growing at any given time. Each hair spends several years in this phase.

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

Telogen (resting phase): Over months, hair growth stops and the old hair detaches from the hair follicle. A new

hair begins the growth phase, pushing the old hair out. Over months, purpose of stabilizing the hair. The cuticle, which is the innermost part that it closest to the hair shaft, is made from dead hardened cells and give the hair shaft added protection. This, together with the capsular layers that make up the Henley's and Huxley's layers, secures the hair and allows it to hair growth stops and the old hair detaches from the hair follicle. A new hair begins the growth phase, pushing the old hair out.^[4, 5]

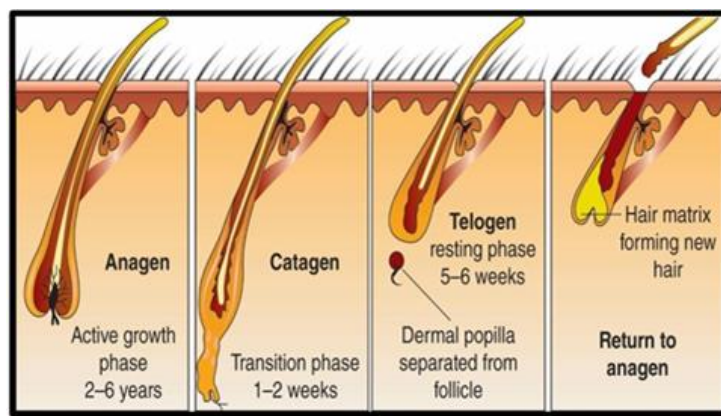


Fig. 3: Phases of Hair Growth.

Need for Shampoo

The skin on our head produce a greasy fluid called sebum. It is produced to protect the hair by coating itself all over the head. This give the hair a healthy shine but when secretes in large amount it makes the hair look dirty.

The use of shampoo is an everyday occurrence for many people. For some, the act of washing their hair is a natural part of their daily routine. Shampoo is an important aspect in everyone's lives due to its beauty and health benefits.

1. It Keeps Your Hair Clean and Healthy

Shampoos with a great scent are important too. In this section, we will talk about the importance of selecting shampoo with a great scent. In the past, brands focused on the ingredients and what was inside the bottle to make it work for their customers. Nowadays, they're also going back to what comes out of the bottle to make it work for their customers. As a result, shampoos have gotten more fragrance-focused and how it smells is a big factor in people's decision making process when picking a shampoo. The first step is to pick a company that understands scent as well as giving you other things you want from your shampoo such as being good for your hair or being cruelty-free. The next step is to find which

scents you like best.

2. You Avoid "Bad Hair Days" by Keeping your Hair Clean and Tangle Free

Most people are not conscious of how important it is to keep your hair clean and tangle free. But, not maintaining your hair properly can lead to a bad hair day.

This section is all about giving you information on how you can prevent this from happening by keeping your hair clean and tangle free.

First, it is important to know that different types of shampoo are better for different types of hair .It's also very important to use the right type of shampoo for the length and texture of your hair.

Second, you should try to use conditioner after shampooing because this will give your scalp a chance to get rid of any impurities that are left in your Pores after washing just with shampoo alone.

3. It Gives a Healthy Glow to Your Hair

We all want to have healthy, shiny, and soft hair. One of the best ways to achieve this is by giving your hair a deep conditioning treatment once in a while. Deep conditioning is an important step in caring for your hair.

When you're deep conditioning, you're basically just adding more moisture into your hair by applying liquids or oils to it. This seals the cuticle and helps keep moisture locked in so that your hair doesn't dry out as quickly between washes.

4. Picking a Shampoo with a Great Scent is Important Too!

Choosing the best shampoo can be a daunting task. It's not just about the ingredients that are inside the bottle, but also about what you want out of it. Some people like to look for shampoos with natural ingredients, while others prefer ones with sulfate-free formulas. There are many things to consider when choosing a shampoo, including what scent you like or want your hair to smell like after washing it. Shampoo is the most important product for personal hygiene. It cleans and cleanses hair and removes all the dirt and oil from hair follicles, ensuring that your hair is not only clean but also healthy.



Ideal Properties of Herbal Shampoo

- Dust and dirt, excess sebum and other greasy substances, hair octopus cells need to be effectively and completely removed.
- It is necessary to generate a sufficient amount of foam to meet the psychological needs of the user.
- It can be easily removed by rinsing with water.
- Keep your hair dry, soft and shiny, easy to handle and minimize splattering.
- It should give your hair a pleasant scent.
- Do not cause side effects or irritation to the skin or eyes. Do not roughen or crack your hands.
- Slightly acidic (pH less than 7) since a basic environment weakens the hair by breaking the Disulphide bonds in hair keratin.
- Produce good amount of foam.^[13]

Common Hair Problems and How to fix it?

In the beauty industry, everyone seems to have a story when it comes to hair problems. No matter what the story, the ultimate goal is healthy, great- looking hair. Here are 10 common hair problems and the best ways to overcome them.

1. Dandruff

Dandruff, scaly particles that cling to the root of the hair, can be caused by a poor diet, an infection, or even a sluggish metabolism.

How to fix it: Once you have ruled out a medical issue with your doctor, use a good-quality anti-dandruff shampoo and conditioner. Remember that beauty professionals can recommend the best products.

2. Hair loss

Although historically discussed as a problem among men, hair loss/thinning hair is also common among women. For most men, it may be male pattern balding. Female hair loss is often caused by stress, medication, changing hormones, and even menopause. Additionally, many hair styling products (chemicals/excessive heat) can contribute to hair loss.

How to fix it: Try a hair loss shampoo to add nutrition and to clean dirt, oil and the build-up of product residue that can cause hair loss. Also, limit the use of heat products to a bare minimum.



Fig. 4: Hair Problem.

3. Dry hair

Shampooing too often causes dry hair. Although squeaky-clean hair is a good thing, many overdo it by washing once, sometimes twice, per day. That will strip away all of the hair's natural oils.

How to fix it: A gentle shampoo will stimulate the oil glands. You're safe washing your hair about every three days using an acidic shampoo with a pH between 5 and 6. Also, try an overnight moisturizing conditioner and a hot oil treatment to battle dry hair.

4. Split ends

Over-brushing hair, excessive perming, too much heat, and lack of a good conditioner cause split ends.

How to fix it: Treat your hair with care; and, if you have split ends, be sure to get a professional trim.

5. Frizzy hair

Frizzy hair occurs when the hair's moisture level falls below normal levels, and it can also be hereditary.

How to fix it: Use a shampoo and conditioner specifically designed for frizzy hair. Talk to a professional for specific product suggestions. You may also want to consider a mild relaxer to keep the frizzies at bay.

6. Dull hair

There are many causes of dull-looking hair — chemical or heat-styling damage, and environmental soils.

How to fix it: After using a moisturizing shampoo, try a cool rinse. The cold water causes the hair shaft to contract, which leaves hair looking smoother and shinier.

7. Heat damaged hair

Use your curling iron or flat iron too much and your hair will become damaged.

How to fix it: You will need to lay off the hot irons as much as possible. Next, start getting your ends trimmed every 3 weeks. Finally, start using a deep conditioner with keratin (to soften your hair) and acetyl alcohol

(which will help retain moisture).

8. Color damaged hair

When you color your hair, chemicals are used to open your hair shaft, leaving your hair extremely porous and prone to brittleness and breakage. How to fix it: Work with a professional, use a dye with special moisturizers, and get pare-color trim (because your ends are prone to soak up excess color).

9. Gray hair

To many, gray hair is a badge of honor. But others would prefer to get rid of it because gray hair can be brittle and more unruly than other strands.

How to fix it: To cover gray hair, go semi- or demi-permanent. It will fade faster, but it is less harsh than a permanent dye. Leave this process to the pros because done incorrectly, a major color change

10. Oily/Greasy hair

Oily hair is caused when the scalp produces too much of a natural oil called sebum. Sebum is produced by sebaceous glands, resulting in excessive amounts of oil.^[14]

Advantages of Herbal Shampoo

- Herbal shampoos are biodegradable and earth friendly.
- It does' cause irritation to the eyes.
- It is cost friendly, not much expensive.
- Regular usage of herbal shampoo can do wonders for your hair.
- A perfect oil balance is achieved by using herbal shampoo.
- They consist of natural essential disinfectant properties that protect hair and scalp from the harsh UV rays of the sun and prevent skin infections.

Herbal shampoo are made out of pure and organic ingredients and there are no synthetic additives or surfactants are free of any side effects.



CONCLUSION

The objective of the study was to develop a stable and functionally effective herbal shampoo by excluding synthetic chemicals, which are normally incorporated in such formulations to larger extent. The purpose of this study was to make an herbal shampoo that gives hair a smooth and smooth effect and is safer than chemical conditioning agents. Synthetic hair shampoo is known to damage the hair cuticle leaving it brittle, dull and dry. The evaluation study on our shampoo showed good cleaning action, better foaming capacity, and quick wetting time. The formulated shampoos were not only safer than the chemical conditioning agents, but also greatly reduce the hair loss during combining as well as strengthen the hair growth. The formulated herbal shampoo was clear and appealing. It showed good cleansing and detergency, low surface tension, small bubble size and good foam stability. A survey of global hair care market trends indicates that consumer's use of herbal hair products significantly increased over the past years. Because hair shampoo are known to damage the hair cuticle and leave brittle, dull and dry hair. The factors like UV radiations, use of harsh chemical products have direct and indirect impact on to the hair.

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