

## A REVIEW ON THE DEVELOPMENT AND EVALUATION OF HERBAL SHAMPOO

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### ABSTRACT

Shampoos are one of the cosmetic products used in daily life. Synthetic preservatives and detergents have sometimes been the cause of adverse effects among consumers. A more radical approach in reducing the synthetic ingredients is by incorporating natural ingredients, whose functionality is comparable with their synthetic ingredients. The main objective of herbal shampoo is to eliminate harmful synthetic ingredient from herbal shampoo formulation and substitute them with a safe natural ingredient. Herbal shampoo is belonging to the cosmetic preparation using herbs and purpose of the hair care products are prepared to eliminate excess oil, dirt and dandruff from the scalp and hair. A shampoo is essentially a detergent solution with appropriate ingredients for additional advantages such as improved hair conditioning, lubrication and medicine. The main object of this present study is to evaluate an herbal shampoo and determine physio-chemical function that emphasize on safety, efficacy and quality of herbal shampoo is natural hair care product. Which is use to remove grease, dirt, dandruff, promote hair growth, strengthen and darkens the hair.

**KEYWORDS:** Herbal shampoo, herbal extract, physio-chemical properties, evaluation, conclusion, references.

### INTRODUCTION

Shampoos are probably the most widely used cosmetic product for cleansing hairs and scalp in our daily life. A shampoo is basically a solution of a detergent containing suitable additives for other benefits such as, hair containing enhancement, lubrication, medication etc.. now a days many synthetic, herbal medicated and non-medicated shampoos are available in the market but popularity of herbal shampoo among consumers is on rise because of their belief that these product being of natural origin are safe and free from side effects. Synthetic surfactants are added to shampoo primarily for foaming and cleaning action. But, their regular use leads to dryness of hair, hair loss, irritation to scalp and eyes. Herbal formulations are considered as alternative to synthetic shampoo but, formulating cosmetic formulations.

In India we use herbals such as shikkakai and reetha that are natural cleaning agents without harmful effects. So, herbal shampoo are popular with the consumer when compared to synthetic one. Herbal shampoo is harmless, chronic condition that occurs when scalp become dry and produces white flakes of dead skin that appears in hair or on shoulders. Hair is one of the vital parts of the body derived from ectoderm of the skin and its protective appendages of the body and considered as accessory structure of the integument along with sebaceous glands, sweat glands, and nails. Shampoos are also serve as lubricants conditioners, medications, and other purposes. Surfactant serve as the primary ingredient in the preparation of shampoo, with additional ingredients serving to boost the product efficacy.

Market available shampoos contains artificial ingredients that are bad for skin. The common surfactant sodium lauryl sulfate damages hair follicles and irritates the

scalp when used in shampoo. Preservatives like formaldehyde are also added to shampoo formulas, which increases sensitivity of skin. As a result a vitamin deficiency may cause slower hair growth, more fragile strands, a decrease in sebum and even hair loss. By supplementing your diet with vitamins, you give your body and hair follicles the nutrients they need to strengthen and thicken your hair growth.

Cosmetics are not only used to modify appearance of an individual, but are also used for care of hair, there are various types of cosmetics available with specific and significant purpose. Many distinct races and cultures employ cosmetics in the day-to-day life. The creative self-expression and self-identity aspect are considered to be the key factors which contribute to the fame of cosmetics in current scenario. The main significance of cosmetics is to provide a new decent look to the person after application. Even though there is a booming success in cosmetic industry but the actual meaning of cosmetics is misunderstood in many Western countries for makeup products but US FDA clearly explained that cosmetics are products, which are generally intended for Application in the human body for altering the appearance, promoting attractiveness, cleansing or beautifying without affecting the body's structure or functions". As per this definition, any product which matches the above statement becomes cosmetic product, but US FDA clearly rejects pure soap as a cosmetic. In Indian cosmetic market which traditionally a stronghold of a few major Brands like Lakme and ponds has seen a lot foreign entrance to the market within the last decade.

### OBJECTIVES

1. To formulate the herbal shampoo.

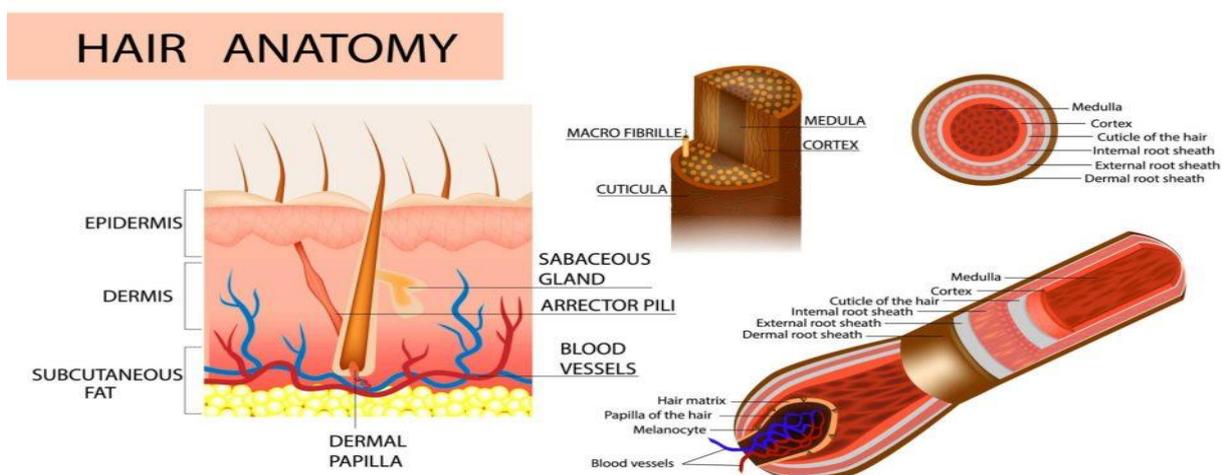
2. To evaluate the herbal shampoo.
3. The part used for formulation is
4. To reduce side effects of chemically synthesized soaps.
5. To improve hair texture.
6. To darken the hair colour.

### HUMAN HAIR CONSISTS OF

By weight, human hair consists of approximately 65-95% protein, along with 32% water, lipid pigments, and various other components. About 80% of human hair consists of a protein called keratin, which has a high sulfur content. Keratin is a laminated complex that provides strength, elasticity, durability, and performance to hair through the assistance of specific structures. The physicochemical properties and appearance of hair are direct outcomes of the cooperation among its various structural components, with proteins being the most crucial. Hair shape is determined by hair follicles: large follicles yield 'terminal' hair (like on the scalp), small ones yield rare 'vellus' hair (found on the body), and curved follicles result in curly hair across all breeds.

### ANATOMY OF HUMAN HAIR

For, many people, hair is a natural part of their look and an expression of their personality. Hair can also offer protection: For instance, it helps to keep the sun's rays from reaching our scalp. Eyelashes and eyebrows keep dust, dirt and sweat out of our eyes. Even the hairs in our nose and ears help to keep out germs and other foreign objects. Body hair helps to regulate our body temperature. The hairs stand up when it's cold, keeping the air that is warmed by the body close to the body – like a warming layer of air.



### DIFFERENT TYPES OF HAIR

Aside from a few places, like the palms of our hands or the soles of our feet, the entire surface of our body has hair on it. The two main types of hair are the shorter and

thinner "vellus" hairs (peach fuzz) found on the body and the longer and thicker "terminal" hairs. Examples of terminal hairs include the hair on your head, facial hair, eyelashes, eyebrows, pubic hair, chest hair and belly hair.

How much of each hair type you have varies from person to person and also depends on your age and sex. Children's bodies mostly have vellus hair, for instance.

About 30 percent of the body's surface is covered with terminal hair in women, compared to about 90 percent in men.



### HAIR STRUCTURE

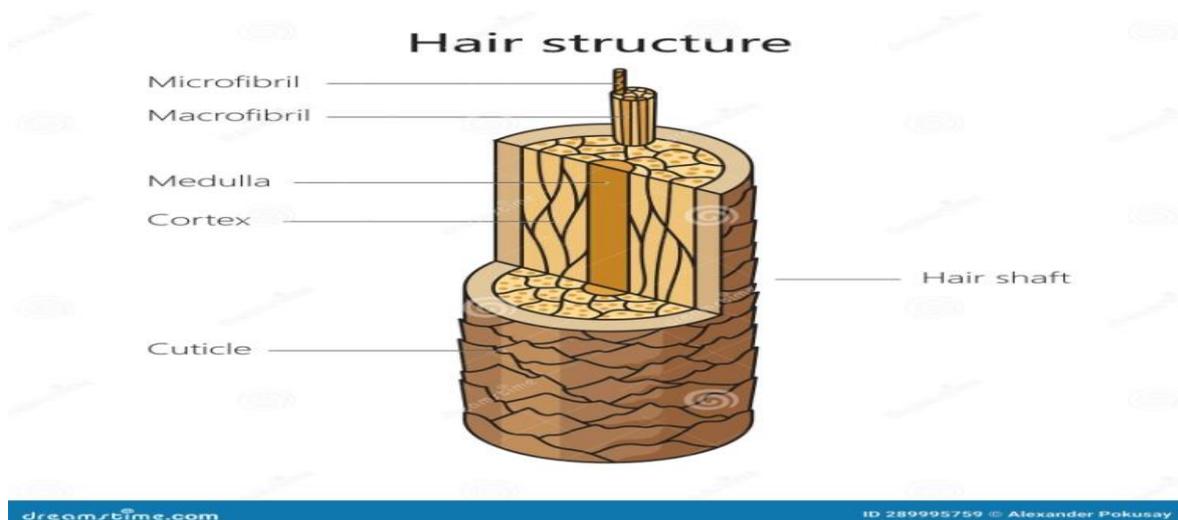
Each hair has a hair shaft and a hair root. The shaft is the visible part of the hair that sticks out of the skin. The hair root is in the skin and extends down to the deeper layers of the skin. It is surrounded by the hair follicle (a sheath of skin and connective tissue), which is also connected to a sebaceous gland.

Each hair follicle is attached to a tiny muscle (arrector pili) that can make the hair stand up. Many nerves end at

the hair follicle too. These nerves sense hair movement and are sensitive to even the slightest draft.

At the base of the hair, the hair root widens to a round hair bulb. The hair papilla, which supplies the hair root with blood, is found inside the bottom of the hair bulb. New hair cells are constantly being made in the hair bulb, close to the papilla.

Illustration: Structure of a hair – as described in the article.



### HOW DOES HAIR GROW ?

New cells are constantly forming in the hair bulb. These cells stick together and harden. The full strand of hair develops from this group of hardened hair cells. Because new hardened cells keep on attaching to the hair from

below, it is gradually pushed up out of the skin. In this way, a single hair on your head grows at a rate of about 1 cm per month. Facial hair, and especially eyelashes, eyebrows and body hair grows at a slower pace.

Whether it is straight or curly will depend on the cross-sectional shape of hair. Round hair grows straight out of the skin. The more oval-shaped the cross-section is, the curlier the hair will be. The color of the hair is determined by the amount of melanin in the hardened cells. This can vary a lot from person to person, and it changes over the course of a lifetime. The amount of melanin typically decreases as people get older, and more air gets trapped inside the hair – it then loses its color and turns white. Depending on someone's original hair color and the number of white hairs that grow, the hair on their head then turns gray or white.

### HAIR GROWTH CYCLE

As long as new hair cells continue to grow in the hair bulb, the hair continues to grow longer. This growth phase is also called the anagen phase. At any point in time, about 90 percent of a person's total amount of hair is in this growth phase.

Depending on where on the body a hair grows, the growth phase will last longer or shorter: For instance, the growth phase of hair on your head can last several years,, so it can grow to over a meter in length if you don't have it cut. The growth phase is especially short for eyelashes, eyebrows, nasal hair and ear hair. Those hairs only grow for about 100 to 150 days, so they can't get that long.

At the end of the growth phase, the hair root separates from the papilla. Then a transitional phase called the catagen phase starts, lasting about two to four weeks. When the hair has separated completely from the papilla, the supply of blood is cut off in the final resting phase, which is also called the telogen phase. The hair is gradually pushed out of the skin and eventually falls out. The resting phase can last several months. New hair cells then start to multiply at the base of the "empty" hair follicle to form a new hair, and the growth phase of the hair growth cycle starts all over again.

What causes increased hair loss ?

Because hairs continue to enter the resting phase and then fall out, we are constantly losing hair. A healthy adult may lose about 70 to 100 hairs on their head per day. But because new hairs are always growing and replacing them, this natural hair loss isn't noticeable.

The rate of hair loss may increase noticeably if the hair roots are damaged during the growth phase or if a lot of hairs go into the resting phase at the same time. If no new hair grows and replaces the hair, that part of the skin becomes bald. This type of hair loss is referred to as alopecia – regardless of how large the bald spot is or whether it affects the scalp or body hair. In some types of alopecia, the hair may grow back. But baldness can also be permanent – one typical example is gradual hair loss in men (male pattern hair loss). Because IQWiG is a German institute, some of the information provided here is specific to the German health care system. The suitability of any of the described options in an individual case can be determined by talking to a doctor. Informed health can provide support for talks with doctors and other medical professionals, but cannot replace them. We do not offer individual consultations.

### MATERIALS AND METHODS

Preparation of plant extracts: Required quantities of *Sapinus indica*, *Bhringraj*, *Shikakai*, *neem* etc., were washed under running water to remove foreign substances, homogenized and boiled in hot water for 4h. The aqueous extract was filtered and concentrated to obtain semi solid mass. Aqueous extracts of remaining ingredients were also prepared by the similar method.

### Preparation of Flaxseed Solution

Add the flaxseeds to the water. Boil this water for around 10 minutes and keep stirring to avoid the flaxseeds from sticking to the base of the utensil. Turn the stove off when you achieve a gel-like texture, not too dense but not too thin. Let the gel cool down for about an hour while it thickens. Put the sock in a glass measuring cup, and then empty the gel in to it. now squeeze the gel from the stock in to the measuring cup in order to strain it.

### FORMULATION OF HERBAL SHAMPOO

The plant extracts were mixed in different proportions to obtain a shampoo whose formula is shown in table- 1. Herbal extracts were added to 10% flaxseed and were mixed by shaking for 20 min. lemon juice [1ml] and methyl paraben were also added with stirring. Finally, the PH of the solution was adjusted by adding sufficient quantity of 1% citric acid solution. Few drops of teatree oil were also added to impart aroma to the prepared shampoo and the final volume was made to 100ml with flaxseed solution.

S.NO:	INGREDIENTS	FORMUALATION	USES
1	<i>Sapindus indica</i>	5gm	Cleanser, removing headlice
2	<i>bhringraj</i>	0.5gm	Promotes hair growth
3	Neem extract	25gm	Strengthening of hair
4	<i>shikakai</i>	25gm	To treat scalp disorder
5	Citric acid	1ml	Balance ph level
6	Methyl paraben	1ml	preservative
7	teatree oil	0.1ml	Prevent dandruff
8	Fenugreek seeds	1gm	Nutrient for hair growth
9	<i>tulasi</i>	10gm	Treat skin disorder
10	Flaxseed solution	Q.s to 100ml	Provides nourishment

### EVALUATION OF HERBAL SHAMPOO

The formulation prepared was evaluated for the clarity, color, odor and foam producing ability.

### DETERMINATION OF PH

The pH of 10% v/v shampoo solution in distilled water was measured by using pH meter (Mi 151, Martini instruments) at room temperature.

### DETERMINATION OF % SOLID CONTENTS

4 grams of shampoo were placed in a previously clean, dry and weighed evaporating dish. The dish and shampoo was weighed again to confirm the exact weight of the shampoo. The liquid portion of the shampoo was evaporated by placing the evaporating dish on the hot plate. The weight and thus % of the solid contents of shampoo left after complete drying was calculated.

### DIRT DISPERSION TEST

Two drops of shampoo were added to 10 ml of distilled water taken in a large test tube. To this solution, one drop of India ink was added and the test tube was stoppered and shaken ten times. The amount of ink in the foam was indicated by the rubric such as None, Light, Moderate or Heavy.

### SURFACE TENSION MEASUREMENT

The surface tension of 10% w/v shampoo in distilled water was measured using stalagmometer at room temperature

### TEST TO EVALUATE FOAMING ABILITY AND FOAM STABILITY

Foaming ability was determined by using cylinder shake method. Briefly, 50 mL of the 1% commercial or formulated shampoo solution was placed into a 250 mL graduated cylinder; it was covered with one hand and shaken 10 times. The total volume of the foam content after 1 min of shaking was recorded.

Foam stability was evaluated by recording the foam volume after 1 min and 4 min of shake test .

### WETTING TIME TEST

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.

### EVALUATION AND CONDITIONING PERFORMANCE

A hair tress of an Asian woman was obtained from a local salon. It was cut into four swatches of the tresses with approximately the length of 10 cm and the weight of 5 g. A swatch without washing served as the control. Other three tresses were washed with the commercial and formulated shampoos in an identical manner. For each cycle, each tress was shaken with the mixture of 10 g of a sample and 15 g of water in a conical flask for

2 min and then rinsed with 50 mL water. Afterward, each tress was left for air drying at room temperature. The tresses were washed for maximum ten cycles. The conditioning performance of the shampoos i.e. smoothness and softness, was evaluated by a blind touch test, administered to twenty randomly selected student volunteers.

### 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. To provide the effective conditioning effects, the present study involves the use of Shikakai, Amla, and other plant extracts instead of synthetic. The main challenge lies in selection of natural material which can be rationally justified and comparable to that of synthetic material. In present study our aim is to develop an herbal shampoo which would be completely natural. We formulated an herbal shampoo by using plant extracts which are commonly used traditionally and lauded for their hair cleansing actions.

All the ingredients used to formulate shampoo are safer than silicones and poly quaterniums synthetic conditioning agents and can greatly reduce the hair or protein loss during combing. Instead of using cationic conditioners we have used Shikakai, Amla, and other plant extracts to provide the conditioning effects. Several tests were performed to evaluate and compare the physicochemical properties of both prepared and marketed shampoos. Our prepared shampoo showed comparable result with that of marketed shampoo for quality control tests but further research and development is required to improve its overall quality.

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