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## Polynomial herb potential to sway the hair care naturally

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### Abstract

The purpose of evaluation and formulation of polyherbal oil is to give influence the overall appearance of a person. In traditional system, herbs used for many medicinal purposes. The herb used to modify the texture of hair and apply on hair to treat the baldness, discoloration of hair, prevent hair loss, dryness of hair, etc. The aim of present work is to formulate the herbal hair oil from leaves of curry, fenugreek seed, onion extract, aloe vera, coconut oil, amla powder. The formulation was evaluated by different properties such as Viscosity, pH, Irritation test, Grittiness, Organoleptic properties, Refractive Index, Saponification value.

**Keywords:** Polynomial, hair care, polyherbal

### Introduction

The concept of beauty and cosmetics are used form ancient times to enhance the appearance of human body. Mostly in ancient civilisation the herbs are only the cosmetics products which is used for their lesser side effects and more effectiveness<sup>[1]</sup>. Hairs play an important role in human life. Hair has a protective role against the adverse effect of environment. For example, temperature<sup>[2]</sup>.

Hairs are made up of cortical cells are composed of a protein, the protein is known as keratin. Keratin is a helical protein. There are two types of keratin fibres exist and they are: type I with acidic amino acid residues and type II with basic amino residues<sup>[3]</sup>. Hair is one of the vital parts of our body. Hair influences the overall elegance of human being.

In Traditional Indian System of medicine many plants and herbal formulations are reported as hair growth promoter and improvement of quality of hair as well. Herbal formulations are known for their use since ancient times, because the herbal oils show minimum side effects and they have more activity for recovery of their related diseases. These hair oils are used to treat the hair problems like thinning of hairs, dryness and other. The hair oils are also useful for improve blood circulation in scalp and prevent dandruff also<sup>[4]</sup>.

Hair care is important not only for our appearance, but also for overall hygiene. To having a healthy hair is permit us to look confident and best. Many of women relate that their hairs are self-confidence key for them. The herbal extracts mean the extracts of herbs. It is an ancient methodology because its origin was discovered from holy Vedas and in Unani system.

### Disease related to hair

Hair loss or Alopecia, is a common complaint form number of men and women due to these changes in our day-to-day life style. Hair fall, dandruff, split ends, premature grey hair are major problem related to hair. Alopecia involves hair loss all over or in circular areas on head, they may cause inflammation. The gradually thinning of hair on the top of head or forehead it called as Frontal Fibrosing Alopecia. Androgenetic alopecia, is also one of the most common types of hair loss, it is temporal-frontal loss of hair in men and central thinning in women hair. Hair damage problem are also associated with hormonal changes, or due to previous medical history. In today, life style, some external factors are pollution, sun exposure and hair products are also trigger the hair loss.

A junk food diet rich in salt and sugar and saturated fats, but less in essential nutrients content can tremendously damage your hair as well as health. The excessive hair styling or hair treatments with hot oil actually swell up the hair follicles. and many more like chemical therapies, colour dyes, blow dryers or bad brushes also affect the hair nourishes. Alopecia is prevalent, and the known include genetic problems, hair cyclic growth problem, and vitamin Deficiency.

Smoking also inhibits the blood flow towards the hair follicles and disturb the process of hair growth and hair fall. It contains carcinogens that weaken the hair follicle. Over exposure to the sun and dust causes brittle, dry and also cause split ends [5].

### 1. Hair anatomy

Hair oil or hair care products are categorized into two category, hair tonics and hair grooming aids. These are basically the extracts of medicinal plants in the form of oil. Today personal care products containing ingredient from the herb origin, which are getting an increasing trend in the

pharmaceutical world. The nature oil is non sticky and addition of perfumes enhances the fragrance.

The proper application of hair oil gives softening the hair, gives shining to hair and more and most important gives cooling effect to brain. The hair care formulation also releases from depression after the oil massage to head. They moistures the scalp and dry hairs. The herbal hair oil maintains normal functions of sebaceous gland as they supply normal essential elements for hair to naturally grow [6].

### Hair Structure

The hair fiber, about 50-100  $\mu\text{m}$  in diameter, has both protective and cosmetics functions. The hair protects the scalp from sunburn and mechanical abrasion and provides thermo-regulation and social contact. The human hair scalp, eyebrows, lashes are long, thick and pigmented terminal hair fiber. However, the body is covered with hairs of 2-4 cm in length under 40 $\mu\text{m}$  in diameter, and often unpigmented hairs. The human hair is divided into three main morphological constituents, also components of the hair follicle: cuticle, cortex and medulla [7].

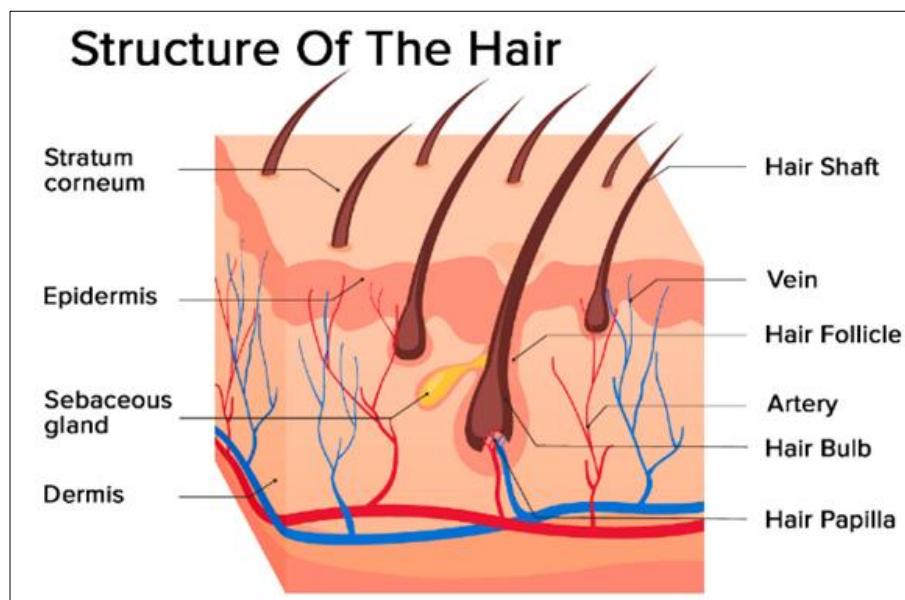


Fig 1: Structure of the hair

### 2. Physiology of hair

#### Hair growth cycle

Hair development is a continuous cyclic process and all mature follicles go through a growth cycle consisting of growth (anagen), regression (catagen), rest (telogen) and shedding (exogen) phases. The duration of the phase changes based on the location of the hair and so personal nutritional and hormonal status and age.

**Anagen:** Almost 85-90% of all scalp hairs are in anagen. Dermal papilla formation is realized and the new hair shaft appears from the skin. This phase can last up to 6-8 years.

**Catagen:** At the end of anagen, mitotic activity of the matrix cells is diminished and the follicle enters a highly controlled involution phase known as catagen.

**Telogen:** The telogen stage is defined as the duration between the completion of follicular regression and the onset of the next anagen phase. Telogen stage lasts for 2-3 months. Approximately 10-15% of all hair is in telogen stage.

**Different type of dandruff:** Dandruff types may be common on the scalp, there are some that could from on different parts of the body. Just as there are different causes of dandruff, there are different types of dandruff.

1. Seborrheic dermatitis
2. Fungal dandruff
3. Psoriasis dandruff
4. Sebum dandruff

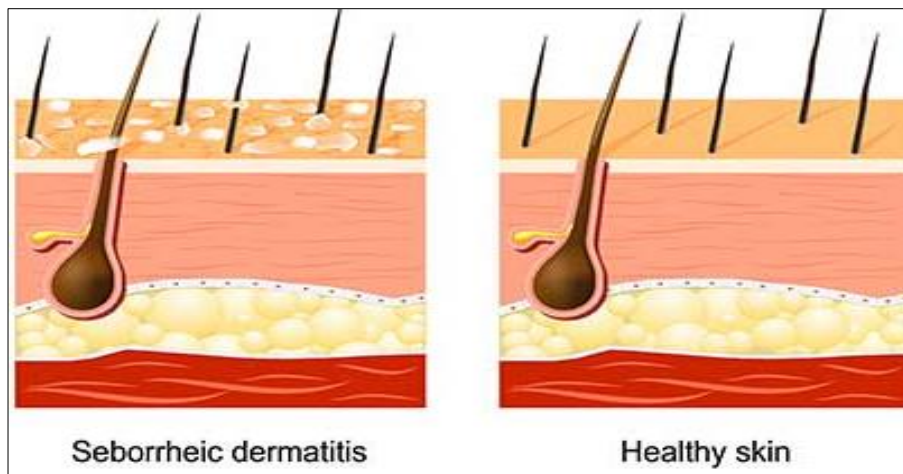


Fig 2: Seborrheic dermatitis

### 3. Herbs

#### A) Coconut oil

**Biological name:** *Cocos Nucifera*, is important member of family *Arecaceae* (palm family) popularly known as coconut, coco, etc.

**Chemical constituents:** Fatty acids, caprylic acid (8%), capric acid (7%), lauric acid (49%), palmitic acid (8%), stearic acid (2%), oleic acid (6%), linoleic acid (2%).



Fig 3: coconut oil

**Uses:** Coconut oil contains a high concentration of lauric acid (about 50%), a fatty acid with a strong affinity for proteins found in the hair. All parts of the fruit of coconut tree can be used. Both the green coconut water and solid albumin ripe fruit are used industrially and in home cooking in many ways. Coconut oil can improve the health condition of hair. It works by helping prevent protein loss in your hair. It is beneficial to apply on the hair both before and after washing it. Coconut oil reduced protein loss in hair, protein loss cause by undamaged, bleached, chemically treated and sun exposed. Additionally, several parts of natural of the fruit and plant have been used by people in different countries for the treatment of various pathological conditions. Currently, the use of natural coconut water is growing. Industry is using this for as a raw material for carpets, car seed stuffing and in agricultural as fertilizers. The hard core is used to make handicrafts [8].

#### B) Curry leaves

**Biological source:** *Murraya koenigii* (L) spreng. The tree is small, strong and smelling perennial shrub commonly found in forests as undergrowth the family *Rutaceae*.

**Chemical Constituent:** Linalool (32-83), Elemol (7.44%), Geranyl acetate (6.18%), Myrcene (6.12%), Allo-ocimene (5.02%), Alpha-terpine (4.9%), (E)-B-Ocimene (3.68%), and Neryl acetate (3.68%).



Fig 4: Curry leaves

**Uses:** Curry leaves contain vitamin C and vitamin B, protein and anti-oxidant, which promote healthy circulation to the blood vessels in the scalp and boost overall health of scalp. Curry leaves for hair are extremely useful as they are loaded with sources of amino acid. Add shine to hair, prevent the premature greying of the hair and provide nutrients. Curry leaves are packed with essential nutrients, vitamins, and proteins that help nourishes the scalp, and strengthen the hair follicles, and they also prevent the hair loss. Nutrients are like calcium, iron, and phosphorous, used to provide nutrients. They have ability to fight and treat fungal, bacterial and protozoal infections. Thus, they clear dandruff. Curry leaves are fully loaded with anti-oxidants and alkaloids, help repair hair damage. Curry leaves contain an oil that acts as a magic remedy to improve the scalp health. The antioxidant-rich oil nourishes the scalp while they remove the all type of dead skin cells. They are full of vitamin B 5 which work wonders for strengthening hair from the roots. The vitamin also helps to fight split end formation and breakage [9].

#### C) Fenugreek seed

**Biological source:** *Trigonella Foenum Graecum*. It is a annual plant belongs to family *Leguminosae*.

**Chemical constituents:** Fenugreek contain 23-26% of protein, 6-7% fat and 58% of carbohydrates of which about 25% is dietary fiber. Fenugreek is also a rich source of iron, containing 33 mg/100gm dry weight.



**Fig 5:** Fenugreek seed

**Uses:** Seeds are used as a natural home remedy for thinning hair. Fenugreek seeds can promote hair scalp health. Fenugreek seed has long been used to treat condition that leads to dry, irritation skin, including dandruff.

The seeds effectively treat all causes of dandruff and scalp irritation. They possess anti-inflammatory, anti-fungal, moisturizing, skin soothing and wound healing properties. Protein, essential fats, zinc, iron are some nutrients that may play a role in supporting hair growth properly [10].

#### D) Aloe vera

**Biological source:** *Aloe barbadensis miller*, It belongs to family *Asphodelaceae (Liliaceae)*. It is shrubby or arborescent, perennial, xerophytic, succulent, pea-green colour plant.

**Chemical constituent:** Vitamin: It contains vitamins A (beta-carotene), C and E, which are anti-oxidants. It also contains vitamin B12, folic acid choline. Antioxidant neutralizes free radicals. Enzymes contains alliasse, alkaline phosphate, amylase, bradykinins, carboxypeptidase, catalase, cellulose, lipase and peroxidase. Minerals provides calcium, chromium, manganese, potassium, sodium and zinc. Anthraquinones, Fatty acid provides 4 plant steroids; cholesterol, campesterol, and lupeol. Hormones are auxins and gibberellins.

It originates from the Arabian Peninsula, but grows wild in tropical, and arid climates around the world. It is cultivated for commercial products, mainly as a topical is attractive for decorative purposes, and succeeds indoors as a potted plant.



**Fig 6:** Aloe vera

**Uses:** It's beneficial for many skin problems like wounds, acne and burns. Aloe vera is also consumed as food and drinks and may have benefits for inflammatory bowel disease, diabetes, hepatitis and more. Aloe vera has many active ingredients and minerals that can help to strengthen your hair. It has fatty acids and amino acids and is rich in vitamins A, B 12, C, E. these play in healthy hair follicles. vera has enzymes that break down fats and so strips your hair of any extra oil (sebum). Aloe vera protect from UV exposure can cause your hair to lose its shine and colour, and make it rough and less elastic, leading to break the hair. Aloenin is a chemical compound in the plant, is a primary factor in promoting hair growth, as found in people with a hair loss condition called alopecia. It has been used to improve hair growth and lessen breakage, which contribute to hair growth.

Aloe vera gel is used commercially as an ingredient in yogurts, beverages, and some desserts, but at high or prolonged doses, ingesting aloe latex or whole leaf or prolonged doses, ingesting aloe latex or whole leaf extract can of topical aloe vera in small amounts is likely to be safe [11].

#### E) Amla

**Biological source:** *Emblia Officinalis* is a medium size tree belonging to the family *Euphorbiaceae*.

**Chemical constituents:** The fruit of amla is rich in vitamin C (ascorbic acid) and contains several bioactive phytochemicals, of which majority are of polyphenols (ellagic acid, chebulinic acid, gallic acid, chebulagic acid, apigenin, quercetin, corilagin, leutolin, etc.

Amla is rich in vitamin C, Tannins, Phosphorus, Iron, Calcium, etc.



**Fig 7:** Amla powder

**Uses:** Amla has a property to condition your hairs. They promote healthy hair growth, and improve the tone of henna hair dyes. They minimize the greying of hair. Boost the volume of hair, also reduce the dandruff along with this treat the lice on head. Amla consists of active constituent that vitamin E supports to healthy circulation while applying the amla topically on hair may promote healing and cell regeneration in given area.

The topical application of amla delivers the Vitamin C, Tannins, Phosphorous, Iron, Calcium. The vitamin C and anti-oxidants can help skin cells regenerate. This may promote a healthier scalp and also minimizing dandruff and resulting in healthier hair. In 2017 preliminary study, which was taken on mice and they found that a patented herbal mixture containing amla powder might stimulate hair

growth among people who experience the hair loss mostly [12].

#### F) Onion

**Biological Source:** An onion is *Allium Cepa L.* from Latin cepa means 'onion' also known as the bulb onion or common onion, is a vegetable that is the most widely cultivated species of genus *Allium*. Belonging to the family *Amaryllidaceae*.

**Chemical constituents:** It contain carbohydrates, fats, proteins, vitamin like B1, B2, B3, B5, B6, B9, and vitamin C. and Minerals. Onions have been variously described as having originated in Iran and Central Asia.

Carbohydrates: sugars and dietary fibers. Thiamine, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin. Calcium, Iron, Magnesium, Manganese, Phosphorous, Potassium, Zinc.



Fig 8: Onion

**Uses:** Onion juice helps improve blood circulation to scalp thereby providing proper nutrition to the hair follicles. It is believed to not only soothe the scalp, and strengthen the strands but also lead to new hair growth. A study tested that the effectiveness of onion juice for hair in treating Alopecia areata (patchy, non-scarring hair loss condition).

**Soothes the scalp:** Onion juice has natural anti-inflammatory properties that help to soothe the scalp irritation and regulate the scalp and promote a healthy scalp.

**Controls the dandruff:** Owing to its anti-microbial and anti-fungal properties, onion helps control seasonal dandruff and nicely cleanses the scalp.

**Prevent Greying:** Onion juice is also believed to help with controlling premature greying. It contains a compound 'catalase' that is known to help control the early greying of roots and help restore the natural colour of the hair.

**Revitalises dry hair:** Onions are rich in flavonoids that act as anti-oxidants and anti-inflammatory agents. They play a vital role in nourishing the scalp by enhancing blood flow in the scalp thereby revitalising dry and damaged hair [13].

#### G) Banyan tree

**Biological source:** It is known as *Ficus Bangalensis*, which is a national tree of India. The family of the banyan tree is *Moraceae*.

**Chemical constituents:** The aerial root contains phytosterolin. Leaves contain triterpin, friedelin and beta

sitostero. The bark of the tree contains a glucoside, bengalinoside and flavonoid glycosides, leucocyanidin and leucopelargonidin.

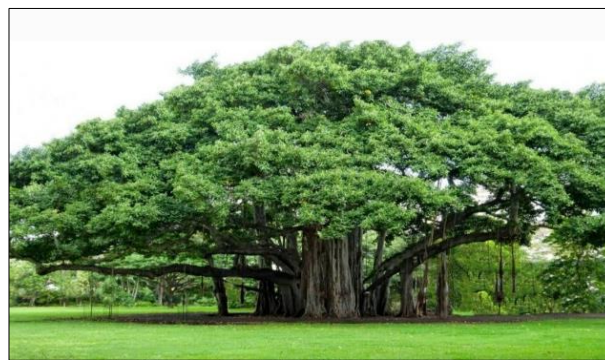


Fig 9: Banyan tree

**Uses:** Banyan tree also has therapeutic usage for hair and also related to skin problems. **Hair Growth Stimulant:** There are banyan tree uses for hair growth and baldness. The leaves of banyan tree help to regenerate new hairs and cures baldness. **Remedy for Hair Problems:** Mix the amount of soft leaves and and apply on your hair. It is very useful to treat all kinds of hair problems. The banyan roots and leaves are used as anti-dandruff, anti-hair fall, conditioning, hair growth, Hair strengthening, hair thickening, healthy scalp, lustre and shine, nourishment, prevents greying, stress relief [14].

#### H) Jasmine

**Biological source:** *Jasminum officinale*, known as the common jasmine or simply jasmine, is a species of flowering plant in the olive family *Oleaceae*. It is native to the caucasus and parts of Asia, also widely naturalized.

**Chemical constituents:** benzyl acetate, benzyl benzoate, phytol, linalool, isophytol, and phytol acetate. Linalool, methyl linolate, eugenol, cis-jasmine, indole, methyl palmitate, jasmine lactone.



Fig 10: Jasmine flower

**Uses:** Jasmine oil, which are obtain form jasmine plant, is a fragrant essential oil that can have benefits properties related to hair and skin both. Jasmine oil can also be used as a hair oil to help keep the hair and scalp moisturized, especially after a wash session. The jasmine is an essential product to protect the hair care routine. They protect the hair from the damaging. The jasmine is full of proteinis and oils,

that help to restore strength and moisture. The hair oil of jasmine is a great moisturizing and protecting product for natural, thick, and curly hair types. They help to soothe and moisture the scalp, and help to lock the moisture into the strands of the hair <sup>[15]</sup>.

### History

Ancient Egyptian gave special attention to hair and images of hairdresser. Archic texts found during this era had information about 'recipies' used by the Egyptians to cure baldness. During this time of period people used combs and ointments to groom and style their hair for good looking. Ancient Egyptian used castor and almond oil to moisture and protection of hair: Ancient Egyptians was a hot and dry. Hair moisturses gave protection from that climate. The Egyptian women massage their hair castor oil and almond oil onto their scalp, for which, they believed also promoted hair growth. Assyrian hairstyling involving iron bars and fire:- Assryian kings around 1500 BC, liked to curly hairstyles. To achieve the look, they had hair curled with iron bars with heated that iron bars in the fire. Now a days we used hair dryer and straightners for give shape to hair. There are numerous ancient beauty secrets that the people used to stay beautiful in those days. The best remedies are used by the queens only. Nearly all our queens were known to be beautiful and they spend hours to taking care of their skin and hair. In India, the royalty of queens were in their long and shiny, lustrous hair <sup>[16]</sup>. Our queens used home remedies or Ayurvedic remedies because they have less chemical based products. These remedies gave them long asting beauty. They look special care of their hair and hair growth as hair were a huge sign of beauty and personality.

### The origin of beauty and hair care in India

The story behind the evolution of beauty and hair care industries are long. The usage of beauty products and cosmetics has been an tradition in India. Actually, the earliest records of cosmetics products and their application date back to Indus valley civilization, 1550 BC.

The best ancient Indian hair care secrets are as following:

**Oiling:** The oil is best ancient Indian hair growth secrets, oiling is crucial to getting the desired and effective hair growth. Indian hair care focuses on hair oils.

The olive oil, Almond oil, Good old Castor oil or a mixture of these oils, and its become a part of hair care related routine. Pollution, heat, chemicals and sun drys damage and make them dry. So, it is necessary to get back moistures. The hairs oil moistures and deeply conditions the scalp and roots from where the rest of your hair gets the nutrition to promote health. The hair get oiling massage to improves blood fow and stimultes the hair follicle for hair growth.

### Shikakai

Shikakai termed as 'Fruit for hair' is a natural product of herbs to cleance the hair. It can be used as a homemade shampoos that are free from chemical. Shikakai strengthens the hair naturally and promote the hair growth. It keeps the scalp clean and healthy by maintaining pH level of it. And fight the infections. Shikakai also have properties to prevent the greying of hair.

**Egg:** Eggs contain all nutrient that are require fir hair. Egg white acts as a perfect substitute for all the shampoos. To

use the egg, apply it to the roots and allow them to absorb all the nutrients for 15-20 min. Eggs deeply nourish your hair and provide them the nutrient which they needed. This hence they promotes hair growth. Indian hair secrets also suggest using the eggs to condition the hair.

### Gooseberry

Gooseberry is used in India for well-known use of them. The gooseberry is used along with lemon, It definitely roots the hair growth and keep the hair healthy. They have high vitamin c source to stimulates collagen production and helps with hair growth <sup>[17]</sup>.

### Discussion

In day-to-day our life style has been changed, so differently. The workload increases, along with this. Hypertension, stress, migraine, lack of sleep, unhygienic food, etc. 99% people are suffer form these problems but due to the daily life schedule, they ignore the hair problem. And after some time they may be face to the alopecia disease. Planetly of people were complaining about the hair problems. The teengers are mostly suffer form premature greying of hair. They also neglect those problems. Just because they didn't get correct guidance. Hair fall, dandruff, split ends are very common in todays life style.

Herbal hair oil is most widely used hair oil, it used widely because they have versatile effects to hair. They provide goodness to hair. The harbal hair oil is rich in nutrients which acts as a food to the hair. In that condition, some people consult the physician and are not able to face any other with this, and if any serious condition they may isolated themsleves. And never want to talk about this. While doing this, they loss their self confidance.

So, according to those problem or to cure the alopecia and to regain the confidance of people. The hair oil was used by 99% of public. But they mostly prefere the herbal hair oil due to its lack side effects. The polyherbal hair oil shows more effects against the hair loss. These oils are used to cure the hair condition. Helps to preventing the hair loss. The hair oil applying our head and massage it, to just boost the blood circulation in the scalp and strengthen the hair. The regular use of this herbal oil provide shine to hair and decrease the rate of premature greying of hair.

The herbal hair oil consist of coconut oil, curry leaves, fenugreek seed, amla powder, aloe vera, onion oil, banyan tree, jasmine flower. They were used for their effect against the hair related problem.

### Conclusion

The Hair loss is a major problem associated with normal changes. Many of the people were complaining about, they suffer from alopecia. The baldness of a person depressed them and low their confidence and sometimes the most of people do not come in contact with others or they isolate themselves. Mostly the young population have problems due to pollution, dust, junk food and other chemical hair products. So, the herbal hair oils are used widely for their less side effects and more beneficial activities. The herbal hair oil is most commonly used all over the India. These hair oil are have versatile effect to the hair. Herbs improves the appearance of person and stay confidant. They are made up of various herbs according to their benefits of hair. They are treating the hair from pollution and other hair loss problem, like alopecia, pre-mature greying of hair. Hair oil are well

known formulation to hair treatments. Herbal hair oil used to moistures the scalp, and help in the dry condition, they act as anti-dandruff and have hair thickening properties. They promote the healthy and shiny hair growth and play important role in hair conditioning.

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