



# INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

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## FORMULATION AND EVALUATION OF POLY HERBAL HAIR OIL.

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### Abstract:

Hair plays a vital role in the personality of human and for their care we use lots of cosmetic products. Herbal formulations always have activity and comparatively lesser or no side effects with synthetic. This study aimed at reviewing the importance of polyherbal hair oil for the treatment of common hair problems such as baldness, alopecia, hair fall, gray hair, dryness, and most common dandruff. The various herbal ingredients are used in the formulation. All ingredients provide essential nutrients such as vitamin, antioxidant, protein, terpenoids, and many essential oils to maintain normal function of sebaceous glands. The formulated oil was evaluated for its organoleptic properties, acid value, saponification value, viscosity, pH etc. All the parameters were found to be good and within the standards. This also helps to gain stability over scalp psoriasis and the damage caused by it on the scalp. Ingredients such as: Coconut oil, Curry leaves, Olive oil, Aloe vera, Hibiscus flower, Fenugreek seeds are used in scalp psoriasis. The main ingredient of this oil is **FENUGREEK SEEDS**. This hair oil reduces dandruff, promotes hair growth, reduces hair fall, naturally dyes and gives shine to our hair. This oil can be for oily scalp as well as dry scalp. We have also mentioned in detail regarding the effect of hormones on hair loss and how we shall try to maintain it all. How shall we do hair care and grooming is also mentioned here.

### 1. INTRODUCTION:

Hair has a several useful characteristics in the animal global. It forms a defensive cushion around the pinnacle & other sensitive elements of the frame. Hair oils are formulated to present the hair properly shine & gloss this is obtain by making use of a thin continuous movie of an oily material on the hair surface without causing stickiness. Many herbs are used in hair oil are Amla, Almond, Hibiscus, and so on. Hair oil has extra favoured as they promote hair growth. enhance beauty of hair & prevent hair fall. Hair oil are hair care products. Hair care merchandise is defined as the formulations which might be used for the reason of cleaning, editing the hair texture, providing nourishment to the hair, and retaining the healthful appearance of hair. Hair oil are hair care components implemented to the hair for the treatment of hair disorder which include baldness, greying of hair, hair fall, dry hair and also allows in providing nourishment to hair. herbal cosmetics are excessive in demand because of increasing hobby of mankind closer to them additionally natural cosmetics are more effective with negligible facet consequences and components are without problems to be had. natural hair oil is a critical part of natural cosmetics. natural hair oil is greater desired and used in lots of aliments of hair. They are now not most effective sell hair boom however additionally offer vital moisture to the scalp rendering in stunning hair. herbal oil which incorporates herbal pills are referred to as hair tonic. natural hair oil gives some of vital nutrient which can be important to keep the normal function of sebaceous gland and promote natural boom of hair. those are

one of the maximum properly identified product for the treatment of hair. using hair oil is growing every day in step with the development in preferred of dwelling of human beings to present herbal flavours and colourings to hair oil the herbal essences and perfumes are introduced. Now a days hair care beauty is delivered with herbs, and they're well recognized as compared with artificial ones. those years, a part of the hair care out inside the use of hair oil is has been increasing and it's far because of their advantages in addressing the hair issues. Hair oils are formulated with each synthetic and natural component. artificial hair oils are those hair care merchandise which might be made by means of chemical or synthetic substances. they're used to offer shine and notable conditioning and they also helps to reduce frizz.

## 2. OBJECTIVES:

- Herbal goodness of hair.
- To identify the best combination of herbs that allows you to deliver maximum effect.
- To save you the dandruff, split ends and dull hair
- Manage frizzy hair.
- Fight towards hair fall.
- Enjoyable rubdown for healthful scalp.

## 3. PLAN OF WORK:

- Problem selection and literature survey.
- Procurement of herbal drug.
- Validation of the synthetic drug and herbal drug.
- Study of herbal drug in detail.
- Project writing and submission.

## 4. STRUCTURE OF HAIR:

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.

A piece of hair may look simple, but it's one of the body's most complicated structures. Hair is made up of two separate structures. The hair follicle is the part below the skin, and the hair shaft is what you see above your skin.

### Hair Follicle

The hair follicle is where your hair begins to grow and is held in place. It's a stocking-like structure that starts in the epidermis, your skin's top layer. It extends to the dermis, your second layer of skin.

At the bottom of the follicle, a piece of tissue called the papilla contains tiny blood vessels (capillaries). These nourish the hair root to keep it growing. The follicle also contains the germinal matrix, where cells produce new hairs.

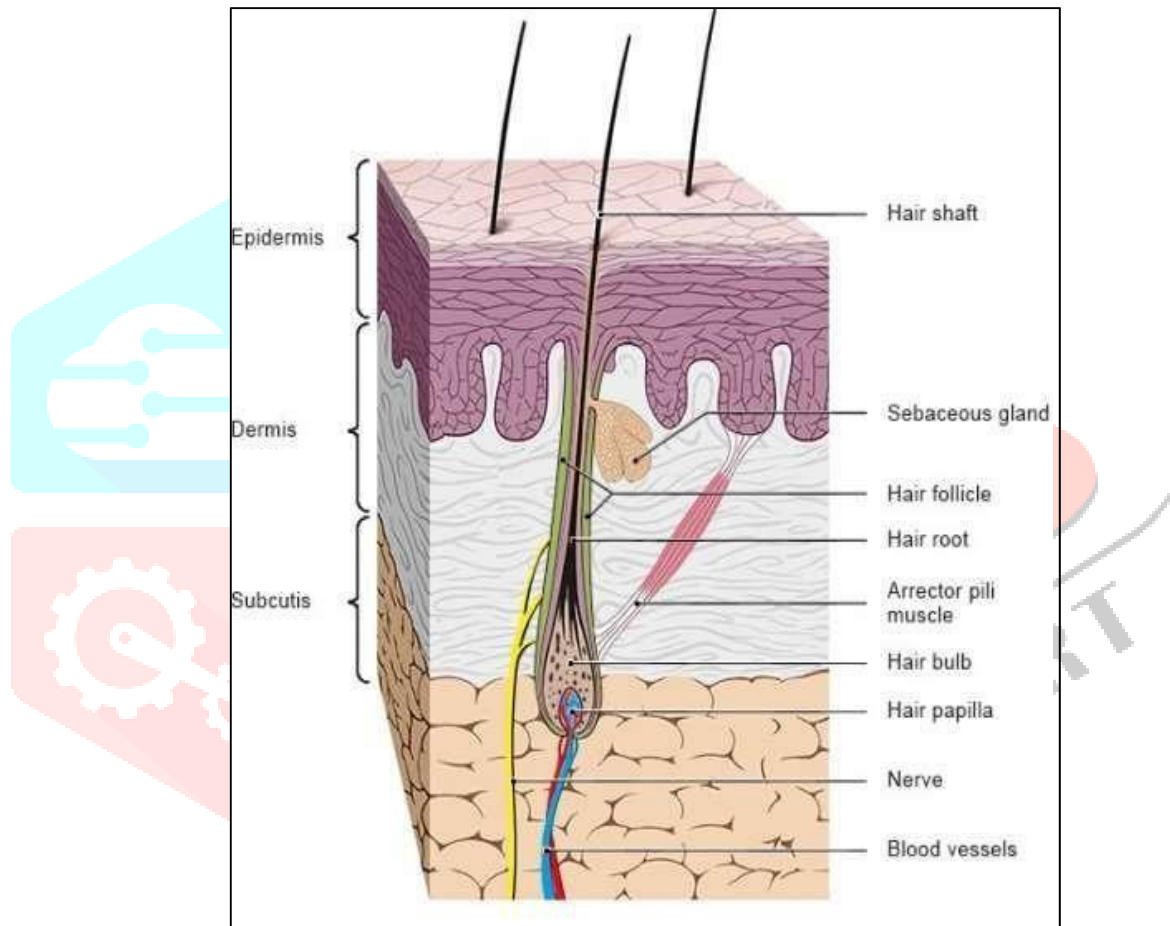
The bulb is the rounded structure deep in the skin at the root of the hair that surrounds the papilla and germinal matrix. It has several types of stem cells, which develop into specialized cells and can renew themselves over a long period of time.

Li KN, Tumber T. Hair follicle stem cells as a skin-organizing signaling center during adult homeostasis.

The follicle is lined by an inner and outer sheath that protects and molds the growing hair. The inner sheath follows the hair and ends just before the opening of the oil gland, or sebaceous gland. The outer sheath continues all the way up to the gland.

The sebaceous gland produces sebum, or oil, which is the body's natural conditioner. More sebum is produced during puberty, which is why acne is common during the teen years. Sebum decreases with age, causing the skin to become dry.

The arrector pili muscle, a tiny bundle of muscle fiber, is attached to the outer sheath. When the muscle contracts, it causes the hair to stand up, otherwise known as goosebumps.



*Figure 1: Structure of hair*

### **Hair Shaft:**

The hair shaft is the part of the hair that we can see. Once the hair grows beyond the skin's surface, the cells aren't alive anymore. It's made up of three layers of keratin, a hardening protein. Those layers are:

- **The Inner Layer:** This is called the medulla. Depending on the type of hair, the medulla isn't always present.
- **The Middle Layer:** This is called the cortex, which makes up most of the hair shaft. The medulla and the cortex contain pigmenting cells responsible for giving hair color.
- **The Outer Layer:** This is called the cuticle, which is formed by tightly packed scales in an overlapping structure that resembles roof shingles. Many hair conditioning products are formulated to clean the cuticle by smoothing its structure.

## 5. FUNTION OF HAIR:

Hair serves a variety of functions, including protection, sensory input, thermoregulation, and communication. For example, hair on the head protects the skull from the sun. The hair in the nose and ears, and around the eyes (eyelashes) defends the body by trapping and excluding dust particles that may contain allergens and microbes. Hair of the eyebrows prevents sweat and other particles from dripping into and bothering the eyes. Hair also has a sensory function due to sensory innervation by a hair root plexus surrounding the base of each hair follicle. Hair is extremely sensitive to air movement or other disturbances in the environment, much more so than the skin surface. This feature is also useful for the detection of the presence of insects or other potentially damaging substances on the skin surface. Each hair root is connected to a smooth muscle called the **arrector pili** that contracts in response to nerve signals from the sympathetic nervous system, making the external hair shaft “stand up.” The primary purpose for this is to trap a layer of air to add insulation. This is visible in humans as goose bumps and even more obvious in animals, such as when a frightened cat raises its fur.

## 6. 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 grow 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 colour 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 colour and turns white. Depending on someone’s original hair colour and the number of white hairs that grow, the hair on their head then turns Gray or white.

Human hair exists everywhere on the body, apart from on the soles of the feet and palms of the hands. It is mostly so fine that it cannot be seen. The reason we have hair on our bodies is that when it is cold, the muscles around the hair follicles contract and the hair stands up on end, to trap more warmth on to the skin, hence the appearance of ‘goose bumps’.

Your hair begins its journey of growth from a root in the bottom of the hair follicle. This root consists of cells and keratin, a protein which is essential for healthy hair growth. Blood from the blood vessels in the scalp nourish the root, which creates more cells and encourages the hair to grow. As the hair is pushed up through the skin as it grows, it passes an oil gland, along the way.

As new, healthy hair cells are produced by the follicles, the old cells are forced out through the surface of the skin. Therefore, the hair that you can see growing on your head, for example, is made of a string of dead keratin cells.

Your hair grows at a rate of around 1.3cm per month and grows faster in summer than in winter. Every hair follicle has its own lifecycle, which consists of two phases, within its lifecycle. The anagen phase (the growth phase, which can last from 2 to 6 years) and the telogen phase (this is the resting phase which lasts a few months). At the end of the resting phase, the hair is shed and the process begins again. Your hair can reach a length of between 30 to 80cm. On an average adult head, there can be up to 150,000 hairs and up to 100 hairs can be shed every day, as new hair is growing all the time.



## 7. HAIR GROWTH CYCLE:

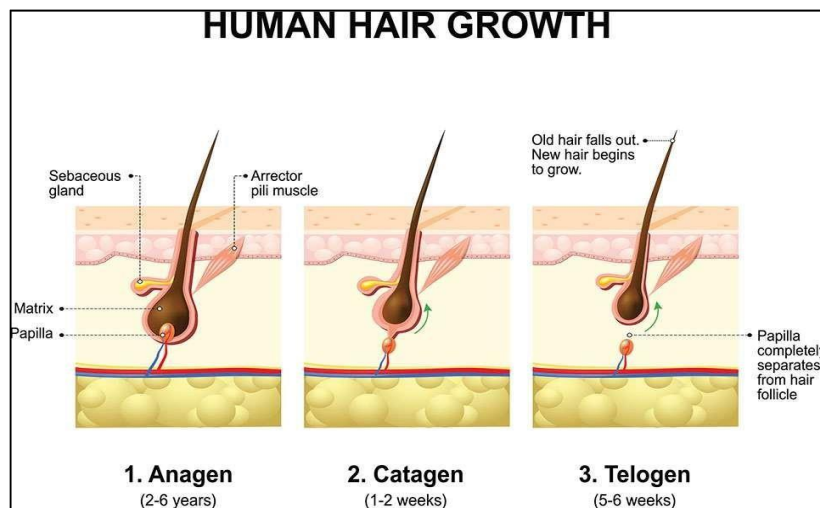


Figure 2: Hair growth cycle

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.

### The Four Stages of the Hair Growth Cycle: Anagen, Catagen, Telogen & Exogen

#### 1. Anagen Phase

##### What is the Anagen Phase?

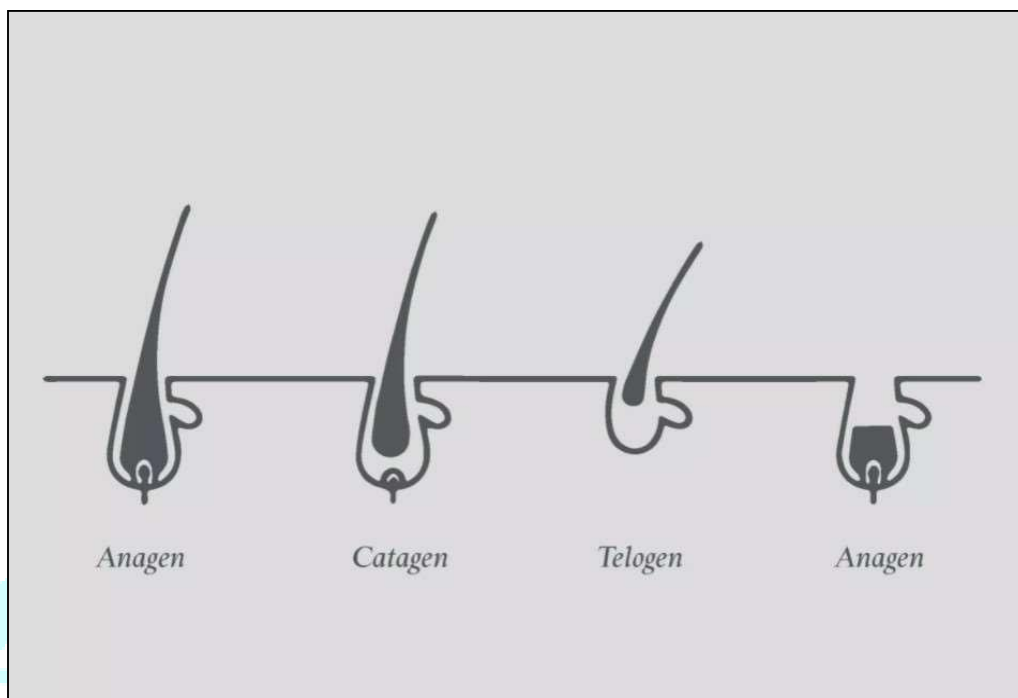
Also known as the 'Growth Phase' or 'Active Phase', the Anagen Phase is when the cells in the root of your hair are most rapidly dividing so more new hair is formed.

##### How much does your hair grow?

During the Anagen Phase, your hair grows around half an inch a month [about 6 inches a year], and faster in the summer than in winter.

##### How long does the Anagen Stage last?

This phase of the Hair Growth Cycle lasts an average of 3-5 years — so a full-length hair growth averaging 18 to 30 inches. The Anagen Phase is generally longer in people of Asian descent, and can last as much as 7 years — meaning your hair may be able to grow up to 3 feet long!



*Figure 3: Four stages of hair growth cycle*

## 2. Catagen Phase

### What is the Catagen Phase?

Following the Anagen Phase, your hair cycle enters a short transitional phase known as the Catagen Phase, which signals the end of active hair growth and cuts individual hairs off from the blood supply and from the cells that produce new hair. Approximately 3% of all hairs are in this stage at any time.

### How long does the Catagen Stage last?

Approximately 10 days.

### Telogen Phase

### What is the Telogen Phase?

The third stage of your natural hair growth cycle is the Telogen Phase, a resting period when strands remain in their follicles but are not actively growing. An estimate of 10-15% of your hairs are in the Telogen Phase at any given moment.

### How long does the Telogen Stage last?

Approximately 3 months or 100 days.

### Exogen Phase

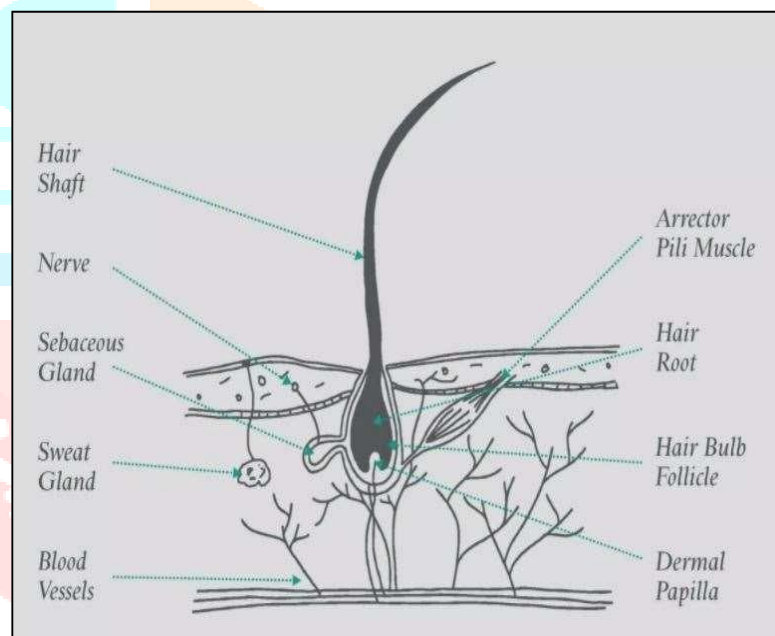
## What is the Exogen Phase?

The final stage of the Hair Growth Cycle, when individual hair strands are released from their follicles and fall out. Now the whole process can begin again!

## What Happens when the Hair Growth Cycle is Disrupted?

Each hair follicle is independent and goes through the growth cycle at different times — otherwise all your hair would fall out at once! Instead, you only shed a certain number of hairs a day – 80 to 100 hairs on a healthy head of hair

Hair loss, hair thinning and problems with hair growth may occur when your growth cycle is disrupted. This can be triggered by conditions such as metabolic imbalances, illness or improper nutrition.



For instance, around 12 weeks after restrictive dieting or a high fever, you may experience telogen effluvium (sudden diffuse hair fall). This occurs when your anagen (growth) phase is cut short, and many hairs enter the telogen (resting) phase at the same time – resulting in increased hair fall 3 months later during the exogen (shedding) phase.

If your hair growth cycle is constantly disrupted (for example, not supported with good nutrition, you may find that your hair will not grow as long as it used to. This is because your hairs are never allowed to stay in the anagen phase long enough to reach the desired length.

### □ Diet & nutrition:

Having a consistent diet that includes a healthy balance of vitamins, iron, fibre and protein will help regulate your Hair Growth Cycle. You can also incorporate nutritional supplements into your daily routine to add in an extra layer of control.

□ **Minimise stress:**

Stress can increase the amount of time your hair spends in the ‘resting’ phases of the cycle where new hair isn’t growing. The more you can adopt techniques to minimise and deal with stress, the more your hair will benefit. Read more about stress and its impact on your hair here.

□ **Choose the right hair care products:**

Products that specifically speak to the needs and demands of your own hair, whether you struggle with hair thinning or limp hair, will help your hairs to make the most of whichever stage they’re in

## 8. What causes hair loss?

Hair loss has many possible causes. The most common include:

- Hereditary hair loss from genetics (genes you inherit from your parents).
- Fungal infections on the scalp.
- Hairstyles that pull the hair tightly (such as braids, hair extensions or tight ponytails).
- Haircare that may cause damage due to processing (including perms and bleach).
- Hormonal changes (such as pregnancy, childbirth or menopause).
- Medical treatment (such as chemotherapy and certain medications).
- Nutritional deficiencies (especially not getting enough iron or protein).
- Stressful events (like having surgery or losing a loved one).
- Thyroid disease.

## 9. What are the symptoms of hair loss?

People experience hair loss in different ways, depending on the type of hair loss and what’s causing it. Common symptoms include:

- Receding hairline (typical of male pattern baldness).
- Thinning hair all over the head (typical of female pattern hair loss).
- Loss of small patches of hair on the scalp.
- Loss of hair on the scalp and body.

## What are the complications of hair loss?

Losing your hair — whether the hair loss is temporary or permanent — can be emotionally difficult for many people. Some types of hair loss can eventually lead to baldness.

If you lose significant hair, it’s important to protect your scalp. Wear a hat, scarf or other head covering when you’re in the sun, and apply sunscreen daily. Sun exposure increases the risk of skin cancer.



## 10. What are the types of hair loss?

Some types of hair loss are permanent, while others are temporary. The most common types of hair loss include:

- **Androgenic alopecia:** This type of hereditary baldness can affect anyone (male pattern baldness or hair loss in women).
- **Alopecia areata:** Alopecia areata is an autoimmune disease that results in hair loss from the head and body.
- **Telogen effluvium:** This type of hair loss involves rapid shedding of hair in a short amount of time. It typically happens a few months after your body goes through something physically or emotionally stressful. It can also result from sudden hormonal changes.
- **Anagen effluvium:** This very rapid hair loss occurs due to certain medical treatments, such as chemotherapy.

## 11. Who should use hair oil?

No matter the beauty routine you're following, there isn't one-size-fits-all for every type of hair. Dr. Khetarpal points out that hair oiling isn't going to affect each head of hair the same way.

“Certain hair types can benefit from oiling more than others,” he says. “People with dry, coarse tightly curled hair can benefit from oiling, while others with fine, straight hair may find oiling weighs their hair down too much. Those who are prone to dandruff should avoid all types of oils.”

Whether or not hair oiling will work for you may depend on:

- How dry or oily your hair naturally is.
- Any medical conditions you may have.
- Previous styling or color.
- Age.
- Ethnic background.

## How often should you oil your hair?

How often you should oil your hair depends on your hair type and needs. Most people will find that oiling their hair once a week is a good starting point. Dry or damaged hair types may benefit from the treatment more often, while oily hair types may choose to oil their hair once a month or only before special occasions.

You probably have this in your hair maintenance routine. Shampoos can make your hair dry and frizzy. Therefore, apply oil every before washing your head to ensure you clean, nourish, and keep it frizz-free. Even if it is difficult to keep up with it every time, try to oil your scalp at least twice a week. However, if you have an oily scalp, you can reduce the frequency of massaging your head.

## 12. Effect of hormones on hair loss:

Hormones have a close association with hair growth; thus, they have a big impact on the hair cycle and hair follicle structure. Many hormones control hair growth, cycle, and density. Hair abnormalities are frequent in therapeutic practice, and they can cause severe emotional discomfort depending on societal and ethnic standards.

As a result, disorders that impact the endocrine system can induce a variety of physiological hair growth and cycling alterations. Hirsutism and patterned hair loss have a significant impact on human personality. These

illnesses necessitate a comprehensive approach to diagnosis and treatment.

Hair is a key physical structure that has a significant impact on a person's psychosocial personality. Hair follicles (HFs) are made up of dermal papilla cells (DPCs) formed from mesenchymal cells and epithelial-derived root sheath cells, with mesenchymal-derived DPCs interacting with epithelial-derived root sheath cells. The hair growth cycle consists of three phases. These phases are anagen, catagen, and telogen representing growth, regression, and rest respectively. DPCs also produce and release a number of cytokines that control hair growth and cycle.

Hair growth, cycling, and density can all be affected by endocrine disorders, and a thorough examination may discover the underlying problem. Hormonal abnormalities include hypertrichosis, hirsutism, and alopecia areata.

However, the task is complicated by a lack of data and a discrepancy in the literature on the effect of hormonal influence on the hair cycle, which has not been properly examined. This article briefly discusses the hormonal impact on hair growth and the association of different endocrine disorders with hair changes.

### **13. Hormones and their effects on hair:**

#### **1. Androgens:**

They are the primary regulators of proper hair growth in humans. They operate on hair follicles through interaction with intracellular receptors inside DPCs, depending on where the hair is located over the body. Androgen's major effect is to interact with androgen receptors in DPCs. The impact of androgens is to change the vellus hairs which are thin, short, and straight into terminal hairs which are darker, bigger, and curlier in sex-specific parts of the body. In both sexes, androgens convert axillary and groin vellus hair follicles, as well as the vellus hair in the trunk and beard area of males, into terminal hair during puberty. The pathophysiology and course of patterned hair loss are influenced by circulating androgens. This is based on the observation that unless testosterone is provided, eunuchs and castrated boys do not acquire male-patterned hair loss. On DPCs, when androgen receptors are occupied by di-hydro testosterone and testosterone, they mediate alteration in the production of soluble factors, influencing the activity and maturity of variable cells, in particular, hair follicle keratinocytes, which results in male patterned hair loss. As a result, scalp hairs get increasingly thinner.

#### **2. Oestrogen:**

Androgens undergo peripheral aromatisation in adipose tissue to make oestrogens. In females, oestrogen is necessary for the development of pubic and axillary hair. Oestrogens, on the other hand, have long been known to have a significant impact on hair follicle changes affecting the growth of hair follicles through binding to high-affinity, locally produced oestrogen receptors. Due to the depletion of finite ovarian follicles, menopause is accompanied by a decrease in oestrogen and progesterone release, which can lead to hair and skin illnesses.

After menopause, the higher frequency of developing female pattern hair loss indicates that oestrogens play a role in the stimulation of hair growth. In postmenopausal women, the aetiologies as well as management strategies of certain conditions including hair loss and hirsutism are quite different compared to premenopausal women.

During pregnancy, high circulatory levels of oestrogen may contribute to the prolonging of anagen, while a drop in circulatory levels of oestrogen in the post-partum period is thought to contribute to post-partum hair loss which is known as telogen gravidarum. The fact that sex steroid hormones exhibit an extraordinarily effective inhibitory function on the hair cycle, notably through halting the clock of the hair cycle in telogen, is perhaps the most exciting feature of oestrogen biology from the standpoint of hair study.

#### **3. Growth Hormone:**

This enhances androgen's influence on sexual hair growth. In growth hormone-deficient hypogonadal males, the required level of testosterone to stimulate hair growth in the axilla may reach around 5 times the normal testosterone level in growth hormone-sufficient hypogonadal boys.

#### **4. Insulin and Insulin-Like Growth Factor (IGF):**

These hormones play a part in hair development stimulation and work in tandem with androgens. Hyperinsulinemia may boost di-hydro testosterone synthesis by inducing 5 $\alpha$  reductase activity.

#### **5. Prolactin:**

Prolactin is a hormone that plays a function in lactation, reproduction, angiogenesis, osmoregulation, and hair development. In females, prolactin promotes the hair shaft lengthening in the front-temporal region of the scalp while inducing catagen in male occipital scalp hair follicles. Prolactin excess is linked to hirsutism in clinical studies, most likely due to the stimulation of hyperandrogenism.

#### **6. Melatonin:**

Melatonin is a hormone that regulates the rhythm of a variety of physiological systems. Melatonin receptors can be present in sweat glands, blood vessels endothelium, epidermal keratinocytes, and dermal fibroblasts, in addition to hair follicle cells. Melatonin affects hair pigmentation primarily by increasing the number of melanocytes, as well as its growth, most likely via accelerating the anagen phase. The ability of melatonin to control the hair follicle response to oestrogens, weakening oestrogen receptors expression in the hair follicle, is one of its most essential functions. One of the roles of melatonin is to activate nuclear factor erythroid-2-related factor 2, which has a significant impact on the protection of hair follicles from oxidative stress and thus to inhibit hair growth suppression.

#### **7. Cortisol:**

Hair loss has become more common in women and young people, and it is thought that stresses, rather than genetic factors, are to blame. As a result, accumulating data on the impact of stress on HFs and their constituent cells is critical for hair loss treatment. The association between stress hormones and hair loss, on the other hand, is poorly understood. Cortisol is recognized to affect the function and cyclic regulation of the hair follicle. High levels of cortisol are linked to a decrease in the formation and early breakdown of hair follicle modulators such as proteoglycans and hyaluronans, which are essential for hair follicle activity. Corticotropin-releasing factor (CRF), in particular, is a key HPA axis hormone in the peripheral stress response. Hair shaft elongation is greatly inhibited by CRF activation.

#### **8. Thyroid:**

Thyroid receptors were detected on the outer root sheath cells of hair follicles. The thyroid hormone is believed to be responsible for regulating the hair cycle's frequency. Hypothyroidism causes a decrease in anagen frequency, whereas hyperthyroidism causes thin hairs.

### **Endocrine conditions causing abnormal/excessive hair growth**

#### **1. Hirsutism:**

Excessive terminal hair in parts of the female body that are androgen-dependent is a symptom of elevated androgen activity in the hair follicle. Worldwide, hirsutism in females frequently leads to psychological suffering, lack of confidence, and cosmetic embarrassment. It is a clinical symptom of hyperandrogenemia (abnormally high levels of androgens detected in the blood). The prevalence of hirsutism ranges from 4-11 percent, however, Asians appear to have a lower rate. With advancing age, the prevalence and severity of hirsutism decrease (especially in postmenopausal women). In 75 percent of patients with hyperandrogenemia, hirsutism is present.

Polycystic ovarian syndrome is the most frequent cause of hirsutism, accounting for more than 70% of cases. Idiopathic hirsutism affects 5-17 percent of hirsutism sufferers, depending on ethnicity and geographic location. The underlying cause of hirsutism in about 1-8% of women is non-classical congenital adrenal hyperplasia due to a 21-hydroxylase deficiency. The majority of females who experience frontal-central pattern hair loss do not have elevated levels of androgen and do not manifest with hyperandrogenism symptoms, such as hirsutism or irregular periods/anovulation.

## 2. Hypertrichosis:

Hypertrichosis is the presence of abundant body hair that is not caused by androgen. It can be hereditary or acquired. Cushing's disease, acromegaly, and hypothyroidism are the main endocrine causes of acquired hypertrichosis. Physical treatment approaches, which are frequently paired with medical therapy, can result in significant cosmetic improvement.

Endocrine conditions associated with hair loss

In both males and females, patterned hair loss is closely associated with sex hormones level, because it is related to alterations in the androgen receptor and responds to antiandrogen medication.

## 3. Male Pattern Hair Loss:

Male pattern hair loss has been classified as androgen-dependent. A study by Sanke et al., comparing the hormonal profile of early androgenetic alopecia in men with the phenotypic equivalent of polycystic ovarian syndrome in women, on the other hand, have discovered hormonal imbalances in androgenetic alopecia similar to polycystic ovarian syndrome. Androgenetic alopecia, or male pattern hair loss, is a common, age-dependent, highly heritable disorder marked by progressive front-temporal and vertex hair loss. The pattern of inheritance is polygenic. The condition is hormone-related with androgen being a key hormonal influence.

## 4. Female Pattern Hair Loss:

Female pattern hair loss (FPHL) is defined as the progressive shrinking of hair follicles, which mainly occurs in genetically predisposed females and is rarely associated with endocrine disorders. Hair loss in women can be a severe source of psychological stress and morbidity, which is unsurprising. Female patterned hair loss affects 6 to 64.4 percent of women, with Asians having a somewhat lower incidence. Female pattern hair loss is prevalent in the 3rd and 5th decades of women's life. The prevalence rises with age, starting at 1.3 percent in the 18-29 year age group and rising to 10.3 percent in the seventh decade and 11.8 percent thereafter. Female pattern hair loss is a complex phenomenon that is associated with multiple contributing factors. The condition is more common in genetically predisposed women with abnormal cycling of the hair follicle, which results in the terminal hair follicles being transformed into shorter and finer vellus hair follicles. There is a steady reduction in the size of the dermal papilla under the effect of sex hormones, as well as a reduction in anagen duration and a prolongation of telogen. Diffuse telogen hair loss affects around 50 percent of people with hyperthyroidism and 33 percent of people with hypothyroidism respectively. Severe hair loss does not always reflect a severe endocrine imbalance. Hypothyroidism in its early stages may present with telogen effluvium as the initial presenting sign. On histopathology, a reduction in the terminal/vellus ratio and follicular miniaturization can distinguish early female patterned hair loss from telogen effluvium. Acute telogen effluvium can sometimes reveal latent female patterned hair loss.

## 14. SCALP PSORIASIS:

Scalp psoriasis is an autoimmune condition. It causes raised, discolored plaques on your scalp or on the skin around your scalp that may be dry, itchy and irritating. Prescription and over-the-counter medications can alleviate your symptoms.

**What is scalp psoriasis?**



Scalp psoriasis (sore-eye-uh-sis) is a long-lasting (chronic) autoimmune disease (caused by your own immune system) that causes your skin cells to reproduce too quickly. It creates thick, discolored patches of skin (plaques) on your scalp and other areas around your scalp. These areas may include:

- Your hairline.
- Your forehead.
- The back of your neck.
- The skin around your ears.



*Figure 5: Visual representation of scalp psoriasis*

### **How does scalp psoriasis affect my body?**

Scalp psoriasis causes thick, rough, scaly, dry, discolored plaques to develop on your scalp and the skin around your scalp. The plaques can be itchy or painful. Scalp psoriasis can cause hair loss (alopecia), and scratching your plaques may worsen that hair loss.

Scalp psoriasis can make you worry about how others look at you. It can also affect your behavior and how you think about yourself. You may become self-conscious or experience stress, anxiety and depression.

### **Symptoms and Causes**

#### **What are the symptoms of scalp psoriasis?**

Symptoms of scalp psoriasis vary.

Mild scalp psoriasis symptoms may involve only small, thin scales or flaking that looks like dandruff.

Moderate or severe scalp psoriasis symptoms include:

- Raised, discolored (red, brown, gray or purple) plaques with a white or silvery surface of dead skin cells.



- Plaques on most of your scalp or your entire scalp.
- Plaques along your hairline, forehead, the back of your neck or on the skin around your ears.
- Dryness.
- Skin flakes.
- Itching.
- Cracks (fissures).
- Bleeding.
- Irritation or pain.

### **What causes scalp psoriasis?**

Scalp psoriasis is an immune system disease. Your immune system overreacts, causing inflammation, which leads to new skin cells growing too fast.

Typically, new skin cells grow every 28 to 30 days. But in people with scalp psoriasis, new skin cells grow and move to the skin surface every three to four days. The buildup of new cells replacing old cells creates thick patches of skin.

Scalp psoriasis can run in families, but the actual triggers are complex. Parents may pass it down to their children, and environmental exposures can include skin trauma, sunburn, medications, stress and other inflammatory or autoimmune health conditions.

### **15. Natural & herbal ingredients used in psoriasis:**

**Aloe Vera:** Aloe Vera is a plant with exceptional skin healing properties. You can directly apply the raw extract from this plant to your scalp and skin around it, or you can apply a cream that contains aloe vera as its ingredient.

This helps minimise skin itchiness, scalp redness, inflammation and control the flaking in the scalp as well.

You need to moisturise the affected area regularly by applying aloe vera thrice a day, and you'll see the effects in a month.

### **Coconut oil:**

Coconut oil is one of the finest natural remedies to treat the symptoms of your scalp psoriasis. The oil comes in both refined and unrefined forms. Unrefined coconut oil is also known as virgin coconut oil.



*Figure 6: Coconut fruit*

For reducing the scalp psoriasis symptoms, apply unrefined coconut oil to your scalp and leave it for 20 to 30 minutes. You can also cover your scalp with a shower cap until you wash it off.

Coconut oil helps moisturise your scalp, reduces inflammation, and kills infectious bacteria. This reduces scalp redness and psoriasis scales.

Coconut oil is a great source of antioxidants, vitamin E and K, minerals and lauric acid. It is believed that coconut may have cooling properties because of which it is used by people with Pitta Dosha. It may also have beneficial properties such as antioxidant, antiviral, antibacterial and antifungal properties. Coconut oil may be a good remedy for itchy scalp. It might be useful to fight dryness, reduce dandruff and eliminate scalp infections and fungus-forming units. You may directly apply coconut oil to the affected regions of the scalp. Let it sit for some time and then rinse it off. Roughly half of people with psoriasis get scales on their scalp. Thick scales on your forehead, hairline, behind your ears, or on the back of your neck can be softened with coconut, olive, or peanut oil.

Massage a small amount into your scalp, then put on a shower cap overnight, and shampoo in the morning. Repeat for two or three nights. The dead skin should soften and wash away.

You can use a comb to lift off the softened scale. Hold it almost flat, and gently move it in a circular motion. Don't scrape your scalp. Read more on the different ways to treat scalp psoriasis.

**CURRY LEAVES:**

*Figure 7: Curry leaves plant*

Curry leaves contain a high amount of minerals like iron and antioxidants such as vitamins C, A, E and folic acid. It may also have antibacterial properties that might help reduce scalp infection. Curry leaves may have a nourishing effect on both hair and scalp.<sup>3</sup>

Curry leaves paste may be beneficial for your itchy scalp. To make curry leaves paste, take a handful of curry leaves and mix them with yoghurt to achieve a paste consistency. Apply this paste to your scalp and allow it to rest for one hour. Then rinse thoroughly with cold water. Repeat this procedure 2 to 3 times a week for best results.

**OLIVE OIL:**

High in omega-3 fatty acids and vitamin E, olive oil appears to ease psoriasis symptoms in multiple ways.

Olive oil is a great moisturizer that does double duty as an anti-inflammatory to calm irritated skin. Apply a small amount to your scalp, elbows, or anywhere you have psoriasis plaques, says Dr. Burns. Or, for a soothing full-body soak, add 2 teaspoons (tsp) of warmed olive oil to your bath water. Evans notes that olive oil is also an important part of an anti-psoriasis eating plan. A growing body of research (such as this study) suggests that the Mediterranean diet, which emphasizes extra-virgin olive oil, can help prevent psoriasis from getting worse.

**ALOE VERA:**

I love this plant,” Burns says. “It helps reduce inflammation and can speed up healing time.” Its many uses, she says, include soothing minor burns, cuts, and scrapes, thanks to its strong antibacterial, antiseptic, and fungicidal properties. Aloe vera also promotes cell growth and acts as a detoxifying agent. Researchers have found that compounds in aloe vera help skin retain moisture, which promotes healing. You can use pure aloe gel, or look for creams with about 0.5 percent aloe content. Apply two to three times a day to soften skin and calm psoriasis flares.

**HIBISCUS FLOWER:**

Hibiscus may be used as a home remedy for itchy scalp. It contains vitamins A and C and iron. It may have beneficial properties like antioxidant, antibacterial and anti-inflammatory properties. Hibiscus herbal preparations may be beneficial for itchy scalp. A herbal mask can be prepared using hibiscus flowers and leaves. It may condition your scalp and hair as well as reduce dandruff. Hibiscus uses for scalp as an astringent, which helps reduce the oil secretion by glands. Take 3 to 4 hibiscus leaves and one flower and grind them together to make a fine paste. You can mix it with any of these (yoghurt, aloe vera gel, almond oil, olive oil or coconut milk). Apply the paste to the scalp for an hour or more and rinse it off with water.

**FENUGREEK SEEDS/ TRIGONELLA FOENUM-GRÆCUM:**

Fenugreek or methi may be a natural, secret ingredient for hair and scalp health. It contains potassium, iron, vitamin C, lecithin and proteins. It might reduce dandruff and may provide a soothing effect to the dry and itchy scalp.

Fenugreek paste may help manage the itchy scalp. To make methi paste, soak 1-2 tablespoons of methi seeds in water overnight. Next morning, grind these seeds into a fine paste using the same water. You can apply this paste to your dry, itchy scalp to reduce the itch.

**16. Ingredients & quantity used in preparation of poly herbal hair oil:**

Sr. No.	Ingredients	Quantity
1.	Aloe Vera	10gm
2.	Coconut oil	q.s
3.	Curry leaves	2gm
4.	Olive oil	5ml
5.	Onion	5gm
6.	Nigella seeds	2gm
7.	Hibiscus flower	10gm
8.	Rosemary	3gm
9.	Muskroot/ Spikenard	5gm
10.	False daisy	3gm
11.	Fenugreek seeds	2gm
12.	Dyer's alkanet	3gm
13.	Sesame seeds	2gm
14.	Indian gooseberry	10gm
15.	Vitamin E capsule (400mg)	1 capsule

**SESAME SEEDS:**

Sesame seed oil helps to reduce the symptoms of psoriasis. Psoriasis is a common, chronic, autoimmune disease that causes dry, red, scaly patches and flakes on the skin. Sesame seed oil helps to reduce excessive dryness due to Vata balancing and Snigdha (oily) properties. This gives relief in psoriasis. You can use Sesame seed oil over baked or boiled vegetables or use it as a salad dressing. Or, you can take Sesame seed oil for general cooking as well to get rid of the symptoms of psoriasis.

**ECLIPTA ALBA/ BHRINGRAJ:**

Bhringraj oil has anti-inflammatory and antifungal properties that help to reduce dandruff. It also relieves symptoms of scalp psoriasis due to its anti-inflammatory property. It also acts great, on the dry scalp to reduce itching. Bhringraj oil can easily penetrate the scalp and moisturize your dry scalp.

**17. Drug profile:****1. Aloe vera (pulp):**

**Synonyms:** Aloe africana, Aloe arborescens Miller, Aloe barbadensis, Aloe barbadensis, Aloe capensis, aloe-coated gloves, Aloe Ferox, Aloe Gel, Aloe Latex, Aloe Leaf Gel, Aloe mucilage, Aloe natalensis, Aloe Perfoliata, Aloe Perryi Baker, Aloe saponaria, Aloe spicata, etc.

**Biological Source:** Aloe is the dried juice collected by incision, from the bases of the leaves of various species of Aloe.

**Botanical name:**

*Aloe perryi* Baker,  
*Aloe vera* Linn or  
*Aloe barbadensis* Mil  
and *Aloe ferox* Miller.

**Family:** Liliaceae.

**Chemical constituents:** The most important constituents of Aloes are the three isomers of Aloins, Barbaloin,  $\beta$ -barbaloin and Isobarbaloin, which constitute the so-called 'crystalline' Aloin, present in the drug at from 10 to 30%. Other constituents are amor-phous Aloin, resin, emodin and Aloe-emodin. N. Barbaloin is present in all the varieties; it is slightly yellow coloured, bitter, water soluble, crystalline glycoside. Isobarbaloin is a crystalline substance, present in Curacao aloe and in trace amount in Cape aloe and absent in Socotrine and Zanzibar aloe.

The chief constituents of Socotrine and Zanzibar aloe are Barbaloin and  $\beta$ -Barbaloin.

**Uses:** The drug Aloes is one of the safest and stimulating purgatives, in higher doses may act as abortifacient. Its action is exerted mainly on the large intestine; also it is useful as a vermifuge. The plant is emmenagogue, emollient, stimulant, stomachic, tonic and vulnerary. Extracts of the plant have antibacterial activity. The clear gel of the leaf makes an excellent treatment for wounds, burns and other skin disorders, placing a protective coat over the affected area, speeding up the rate of healing and reducing the risk of infection. To obtain this gel, the leaves can be cut in half along their length and the inner pulp rubbed over the affected area of skin. This has an immediate soothing effect on all sorts of burns and other skin problems.



Figure 8: Aloe vera



## 2. Coconut oil:

**Synonyms:** Coconut oil, coconut butter, copra oil.

**Biological source:** Coconut oil is the oil expressed from the

**Botanical name:** *Cocos nucifera* L.

**Family:** Palmae.

**Chemical constituents:** Coconut obtained from the hard, dried endocarp consists of a mixture of triglycerides of saturated fatty acids. The oil contains about 95% of saturated fatty acids with 8 and 10

carbon atoms. It shows the presence of caprylic acid, 2%; capric acid, 50–80%; lauric acid, 3%; and myristic acid about 1%.

**Uses:** Coconut oil is used as dietary products in many areas of the world. In European pharmacopoeia, fractionated coconut oil is known as 'Thin vegetable oil'. It is useful as a nonaqueous medium for the oral administration of some medicaments. Fractionated coconut oil is used as a basis for the preparation of oral suspension of drugs unstable in aqueous media. Diets based on medium chain triglycerides including preparations made from coconut oil are used in conditions associated with mal - absorption of fat such as cystic fibrosis, enteritis, and steatorrhoea. Abdominal pain and diarrhoea have been reported in patients taking diet based on medium chain triglycerides. In addition to being good for your scalp, coconut oil also moisturizes your hair. Since it's easily absorbed, it works better than other oils at repairing dry hair. Keep in mind that coconut oil alone may not be effective as a shampoo to cleanse hair, but as a pre- shampoo treatment, it will condition hair.



Figure 9: Coconut oil

## 3. Curry leaves:

**Synonyms:** Curry Leaf English, Mitha Neem in Hindi, and Karuveppilei in Tamilnadu and Surabhinimba in Sanskrit.

**Biological source:** The curry tree or *Berbera koenigii* (syn. *Murraya koenigii*), is a tropical and sub- tropical tree.

**Botanical name:** *Murraya koenigii*

**Family:** Rutaceae (the rue family, which includes rue, citrus, and satinwood), native to Asia.



Figure 10: Curry leaves

**Chemical constituents:** Compounds found in curry tree leaves, stems, bark, and seeds include cinnamaldehyde, and numerous carbazole alkaloids, including mahanimbine, girinimbine, and mahanine. Nutritionally, the leaves are a rich source of carotenoids, beta-carotene, calcium and iron.

**Uses:** Promotes Hair Growth

Curry leaves contain Vitamin C, Vitamin B, proteins, and antioxidants, all of which contribute to cellular regeneration and promote healthy circulation to the blood vessels in the scalp. These properties help to promote hair growth and skin renewal and boost the overall health of the scalp. The topical application of the ingredient activates the hair follicles and promotes hair growth. Adds Shine

Curry leaves for hair are extremely useful as they are a rich source of amino acids. Amino acids present in these leaves help retain hair strength and impart shine to the hair.

**Controls Hair Loss**

Curry leaves are packed with essential nutrients, vitamins, and proteins that help nourish the scalp, strengthen hair follicles, and prevent hair loss. Nutrients like calcium, iron,

and phosphorus, give your locks much-needed nourishment. Prevents Premature Greying

Curry leaves are the ultimate solution for premature greying of hair and they provide the scalp with essential nutrients.

**Clears Dandruff**

Anti-fungal, anti-bacterial, and anti-inflammatory properties of curry leaves promote a healthier scalp. They protect the scalp from infections and are safe for people with sensitive scalp.

#### 4. Olive oil:

**Synonyms:** Salad oil; sweet oil; oleum olival.

**Biological source:** Olive is an evergreen xerophytic tree grown for its drupes, which yield oil and are also ma

**Botanical name:** *Olea europaea*

**Family:** Oleaceae

**Chemical constituents:** Olive oil is composed mainly of the mixed triglyceride esters of oleic acid, linoleic acid, palmitic acid and of other fatty acids, along with traces of squalene (up to 0,7%) and sterols (about 0,2% phytosterol and tocosterols).

**Uses:** Acts like a skin cleanser, Solves dandruff problem, Your hair will be hydrated, Soothes dry scalp, etc.



*Figure 11: Olive oil*

## 5. Onion (fruit) :

**Synonym:** *Allium ascalonicum*, *Allium cepa aggregatum*, *Allium cepa viviparum*, *Allium fistulosum*, *Allium haematochiton*, Egyptian onion, Japanese leek, Welsh onion.

**Biological source:** An onion (*Allium cepa* L., from Latin *cepa* meaning "onion") is a vegetable that is the most widely cultivated species of the genus *Allium*.

**Botanical name:** *Allium cepa*.



Figure 12: Onion fruit

**Chemical constituents:** Freshly cut onions often cause a stinging sensation in the eyes of people nearby, and often uncontrollable tears. This is caused by the release of a volatile liquid, *syn*-propanethial-S-oxide and its aerosol, which stimulates nerves in the eye. This gas is produced by a chain of reactions which serve as a defence mechanism: chopping an onion causes damage to cells which releases enzymes called alliinases. These break down amino acid sulfoxides and generate sulfenic acids. A specific sulfenic acid, 1-propenesulfenic acid, is rapidly acted on by a second enzyme, the lachrymatory factor synthase (LFS), producing the *syn*-propanethial-S-oxide. This gas diffuses through the air and soon reaches the eyes, where it activates sensory neurons. Lacrimal glands produce tears to dilute and flush out the irritant.

**Uses:** onion juice can provide extra sulfur to support strong and thick hair, thus preventing hair loss and promoting hair growth. The sulfur from onions may also help promote collagen production. Collagen in turn helps the production of healthy skin cells and hair growth.

## 6. Nigella seeds:

**Synonyms:** Black caraway, also known as black cumin, nigella, kalonji, charnushka, etc.

**Biological source:** *Nigella sativa* is an annual flowering plant in the, native to eastern Europe (Bulgaria and Romania) and western Asia (Cyprus, Turkey, Iran and Iraq), but naturalized over a much wider area, including parts of Europe, northern Africa and east to Myanmar.[1] It is used as a spice in many cuisines.

**Botanical Name:** *Nigella sativa*.

**Family:** Ranunculaceae.



Figure 13: Nigella seeds

## Chemical Constituents:

Oils are 32% to 40% of the total composition of *N. sativa* seeds. *N. sativa* oil contains linoleic acid, oleic acid, palmitic acid, and *trans*-anethole, and other minor constituents, such as nigellicine, nigellidine, gellimine, and nigellimine N-oxide. Aromatics include thymoquinone, dihydrothymoquinone, *p*-cymene, carvacrol,  $\alpha$ -thujene, thymol,  $\alpha$ -pinene,  $\beta$ -pinene and *trans*- anethole. Protein and various alkaloids are present in the seeds.

**Uses:** Black seed oil has a number of medicinal and beauty benefits including promoting hair health, reducing hair loss, easing acne, reducing inflammation, and lowering blood sugar levels. Black seed oil is also known to help with dandruff and injecting more moisture in to hair.

## 7. Hibiscus Flower:

**Synonym:** Shoeblick plant, Mahagua, mahoe, cotton rose, Roselle, Jamaica sorrel, swamp rose mallow, *Hibiscus mutabilis*.

**Biological source:** *Hibiscus rosa-sinensis* is a species of tropical hibiscus, a flowering plant in the Hibisceae tribe. It is widely cultivated as an ornamental plant in the tropics and subtropics.

**Botanical name:** *Hibiscus rosa-sinensis*.

**Family:** Malvaceae.



Figure 14: *Hibiscus flower*

**Chemical constituents:** The preliminary phytochemical analysis showed that *Hibiscus rosa-sinensis* contained tannins, anthraquinones, quinines, phenols, flavanoides, alkaloids, terpenoids, saponins, cardiac glycosides, protein, free amino acids, carbohydrates, reducing sugars, mucilage, essential oils and steroids. *Hibiscus rosa-sinensis* contained cyclopropanoids, methyl stercolate, methyl-2-hydroxy stercolate, 2- hydroxystercolate, malvalate and beta-sitosterol. The major anthocyanin in the flower was cyanidin 3- sophoroside.

**Uses:** Hibiscus for hair is highly beneficial in treating oily scalp issues such as dandruff and itchiness due to its astringent properties. Neem also possesses antimicrobial properties, and this combination acts as an excellent treatment for dandruff, oily scalp, and growing healthier hair.



## 8. Rosemary Plant:

**Synonym:** Polar Plant, Compass Plant, Compass Weed.

**Biological source:** Oil of Rosemary is distilled from the flowering tops of leafy twigs of Rosmary plant.

**Botanical name:** Rosmarinus officinalis.

**Family:** Lamiaceae.

**Chemical constituents:** The fresh material yields about 1–2% of volatile oil containing 0.8–6% of esters, and 8– 20% of alcohols. The principal constituents are 1,8- cineole, borneol, camphor, bornyl acetate, and monoterpene

hydrocarbons. Rosemary leaves also contain the triterpene alcohols  $\alpha$ - and  $\beta$ -amyrins, rosmarinic acid, rofficerone caffeic acid, chlorogenic acid,  $\alpha$ -hydroxydihydrocaffeic acid, glycosides of luteolin and diosmetin, carnosolic acid, carnosol, rosmanol, epirosmanol, and isorosmanol.

**Uses:** Rosemary hair growth oil is quite effective in curbing hair loss and promoting blood circulation in the scalp, which helps improve hair growth. However, it should never be used in a concentrated form but should be diluted using Coconut Oil or any other hair oil that suits your hair to offer better results.



Figure 15: Rosemary plant

## 9. Muskroot/ Spikenard root:

**Synonyms:** Nard, nardin, and muskroot, Nardostachys jatamansi, etc.

**Biological source:** Spikenard is a class of aromatic amber-colored essential oil derived from *Nardostachys jatamansi*, a flowering plant which grows in the Himalayas Nepal, China, and India.

**Botanical name:**

Nardostachys  
jatamansi.

**Family:** Honeysuckle.

**Chemical constituents:** Spikenard oil, including alcohols, aldehydes, ketones, oxides, esters, monoterpenes, and sesquiterpenes. This great diversity of chemistry suggests a plethora of uses for Spikenard oil.



Figure 16: Muskroot/Spikenard root



**Uses:** Massaging spikenard oil at the roots of the hair gives the hair follicles a natural boost. The oil penetrates deeper inside, nourishing and stimulating the hair follicles from within. The active compounds like jatamansi acid and nardin present in the jatamansi extracts also prolong the growth phase of the hair.

## 10. False daisy (leaves) :

**Synonym:** False daisy, yerba de tago, guntagalagara aaku, Karisalankanni, and bhringraj.

**Biological source:** Eclipta prostrata, Eclipta alba, is a species of plant. It is widespread across much of the world.

**Botanical name:** Eclipta alba (L.) Hassk. (also known as Eclipta prostrata Roxb).

**Family:** Asteraceae.

**Chemical constituents:** The principal constituents of Eclipta alba are coumestan derivatives like wedololactone [1.6%], demethylwedololactone, desmethyl-wedololactone-7-glucoside and other constituents are ecliptal,  $\beta$ -amyrin, luteolin-7-O-glucoside, hentriacontanol, heptacosanol, stigmasterol.

**Uses:** It nourishes the scalp and hair follicles that make it favorable for the hair follicles to regenerate more hair strands. The Vitamin E-rich herb, the false daisy plant, is responsible for nourishing the hair scalp, which hydrates the hair strands and makes them shiny and healthy.

## 11. Fenugreek seeds:

**Synonym:** Herbaceous plant, genus Trigonella, fenugreek seed, Trigonella, Greek clover, Trigonella foenum-graecum.

**Biological source:** Fenugreek is an annual plant, with leaves consisting of three small obovate to oblong leaflets. It is cultivated worldwide as a semiarid crop. Its seeds and leaves are common ingredients in dishes from the Indian subcontinent, and have been used as a culinary ingredient since ancient times. Its use as a food ingredient in small quantities is safe.



Figure 17: False daisy (leaves)

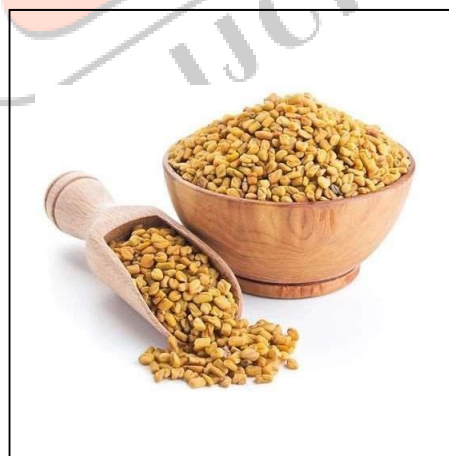


Figure 18: Fenugreek seeds

**Botanical name:** *Trigonella foenum-graecum*.

**Family:** Fabaceae.

**Chemical constituents:** Constituents of fenugreek seeds include flavonoids, alkaloids, coumarins, vitamins, and saponins; the most prevalent alkaloid is trigonelline and coumarins include cinnamic acid and scopoletin. Research into whether fenugreek reduces biomarkers in people with diabetes and with pre-diabetic conditions is of limited quality. As of 2020, there was no high-quality evidence for whether fenugreek is safe and effective in relieving dysmenorrhea or improving lactation during breastfeeding. Studies of fenugreek are characterized as having variable, poor experimental design and quality, including small numbers of subjects, failure to describe methods, inconsistency and duration of dosing, and non-recording of adverse effects.

## 12. Dyer's alkanet root:

**Synonym:** *Geranium pallidum*, *Geranium patens*, *Geranium radicans*, Ratanjot.

**Biological source:** *Alkanna tinctoria*, the dyer's alkanet or simply alkanet, is a herbaceous flowering plant. Its roots are used to produce a red dye. The plant is also known as dyers' bugloss, orchanet, Spanish bugloss, or Languedoc bugloss. It is native to the Mediterranean region. *A. tinctoria* has 30 chromosomes and is regarded as a dysploid at the tetraploid level ( $4x + 2$ ).



Figure 19: Dyer's alkanet root

**Botanical name:** *Alkanna tinctoria*.

**Family:** Boraginaceae.

**Chemical constituent:** It contains a variety of naturally occurring chemicals, mainly a naphthoquinone derivative called alkannin. Alkannin has a deep red color in a greasy or oily environment and a violet color in an alkaline environment. Extraction of coloring agents from ratanjot has been examined by Arora, et al.

**Uses:** Hair Growth Booster: Experience the potential benefits of enhanced hair growth with Ratanjot Powder, aiming to help fuller, healthier-looking locks. Havintha Ratanjot Powder can provide comforting relief for minor burns, helping to soothe irritated skin and accelerate the healing process.

### 13. Sesame seeds:

**Synonym:** Herb, herbaceous plant, genus *Sesamum*, Benny, *Sesamum*, Benni, benniseed.

**Biological source:** Sesame oil is obtained by refining the expressed or extracted oil from the seeds of cultivated varieties of *Sesamum indicum* Linn.

**Botanical name:** *Sesamum indicum*.

**Synonym:** herb, herbaceous plant, genus *Sesamum*, Benny, *Sesamum*, Benni, benniseed.

**Family:** Pedaliaceae.

**Chemical constituents:** Sesame oil consists of a mixture of glycerides of oleic (43%), linoleic (43%), palmitic (9%), stearic (4%), arachidic, hexadecenoic, lignoceric, and myristic acids. It also contains the lignan sesamin (1%), the related sesaminol and vitamins A and E. During industrial refining, sesaminol is readily converted into antioxidant phenols sesamol and sesaminol. The seeds also contain a lignan sesaminol,  $\gamma$ -tocopherol, sesaminol, pinoselin, its glycosides, sesaminol glucosides VI, VII, and VIII, triglycoside KP3, carbohydrates (20%), proteins (20–25%), sterols (campesterol, stigmasterol,  $\beta$ -sitosterol, and  $\Delta^5$ -avenasterol),  $\gamma$ - and  $\delta$ -tocopherols.

**Uses:** Yes, sesame seeds and oil can help in hair growth. Sesamin, a bioactive substance found in sesame seeds and oil, helps to prevent hair loss and greying. It can also be used to hydrate a dry scalp and prevent hair from the harmful effects of the sun and pollutants.

### 14. Indian gooseberry (fruit):

**Synonym:** Emblica, Indian goose berry, amla.

**Biological source:** This consists of dried, as well as fresh fruits of the plant *Emblica officinalis* Gaertn (*Phyllanthus emblica* Linn.)

**Botanical name:** *Phyllanthus emblica* & *Emblica officinalis* Gaertn. or *Phyllanthus emblica* Linn.

**Family:** Euphorbiaceae.



Figure 20: Sesame seeds



Figure 21: Indian gooseberry

**Chemical constituents:** It is highly nutritious and is an important dietary source of vitamin C, minerals, and amino acids. The edible fruit tissue contains protein concentration 3-fold and ascorbic acid concentration 160-fold compared to that of the apple. The fruit also contains considerably higher concentration of most minerals and amino acids than apples. The pulpy portion of fruit, dried and freed from the nuts contains: gallic acid 1.32%, tannin, sugar 36.10%; gum 13.75%; albumin 13.08%; crude cellulose 17.08%; mineral matter 4.12%; and moisture 3.83%. Tannins are the mixture of gallic acid, ellagic acid, and phyllembin. The alkaloidal constituents such as phyllantidine and phyllantine have also been reported in the fruits. An immature fruit contains indolacetic acid and four other auxins—a1, a3, a4, and a5 and two growth inhibitors R1 and R2.

**Uses:** The fruits are diuretic, acrid, cooling, refrigerant, and laxative. Dried fruit is useful in haemorrhage, diarrhoea, diabetes, and dysentery. They are useful in the disorders associated with the digestive system and are also prescribed in the treatment of jaundice and coughs. It has antioxidant, antibacterial, antifungal, and antiviral activities. Amla is one of the three ingredients of the famous ayurvedic preparation, triphala, which is given to treat chronic dysentery, bilousness, and other disorders, and it is also an ingredient in chyavanprash.

### 18. Evaluation tests:

PARAMETERS	RESULTS
Physical appearance	Reddish brown
Odour	Good
Ph*	6.8±0.012
Viscosity (cps)*	30
Refractive index	1.29
Saponification value	0.83
Antimicrobial study (microorganism: <i>Candida albicans</i> )	Zone of inhibition (cm) Herbal hair oil 1.43

### 19. Formulation:

The formulation of this particular Herbal hair oil is done by the process of extraction. Extraction process usually helps a formulation to get the most of the therapeutically active ingredients in it and it also helps us to achieve the most of every crude drug.

### EXTRACTION PROCESS OF POLY HERBAL HAIR OIL:

The process of extraction begins by adding coconut oil to a clean beaker on low flame followed by adding olive oil to it. Once the mixture of both oils start getting aromatic we shall add in all the root used in this poly herbal oil. Roots such as Dyer's alkanet and Spikenard.



The roots are added initially after the oils as they're hard in nature and take a long time to extract their active ingredients.



*Figure 22: Extraction process*

After the roots are heated up in oil at low flame, we shall add in all the Aloe vera pulp along with Fenugreek seeds (which were soaked in Aloe vera overnight) after this we add in finely chopped onions along with all the mentioned seeds (sesame & nigella) keep stirring this mixture until the onions turn pinkish and add in Indian gooseberry to it which will also be required to be finally chopped. In the final steps of extraction, we add in the leaves and flowers. One shall not put in the leaves and flowers initially as it can burn and the oil may not be appropriate for our use. Leaves such as curry leaves, rosemary and hibiscus flower are added and after 5 minutes we can turn off the gas. Now let the mixture cool down to room temperature. Once the mixture is cooled, we shall strain it off with the help of a strainer and add a capsule of vitamin e to it. The oil is now ready to use.

## **20. Result & Conclusion:**

Herbal hair oil is one of the most well recognized hair treatments. Herbal hair oil not only moisturizes scalp but also reverses dry scalp and dry hair condition. It provides numerous essential nutrients required to maintain normal function of sebaceous glands and promotes natural hair growth. The herbal hair oil was prepared from various herbs and their importance in the formulation is presented in. The various parameters like skin irritation test, viscosity, pH, irritation test, grittiness test, saponification value and acid value of herbal hair oil was evaluated. Hence, from the present investigation it was found that the formulated herbal hair oil has optimum standards and further standardization and biological screening establishes the efficacy of formulated herbal hair oil. Herbal hair oils have always been very popular for the range of benefits that they bring to your hair. They are essentially plant extracts and have a combination of antioxidants, bioactive compounds, and different nutrients which work in synergy to add to the health of your hair. The natural properties of herbal hair oils help treat various hair problems including hair fall and dry scalp issues. These oils help in promoting hair growth by facilitating better blood circulation in the scalp. The oils also help in curbing the growth of dandruff and add volume to your hair. The fatty acids and other ingredients present in these oils also replace lost lipids in the hair which is one of the reasons for split hair. You can also combine the benefits of different oils by creating a blend of different herbs with coconut oil or any other essential oil.

A nice good hair massage with any good herbal hair oil will help promote hair growth. However, there are some blends that are considered to be better for faster hair growth. Let's look at some of them.



## Hair grooming:

Use this herbal hair oil on dry hair, applying it the night before washing. Pour some of the infused oil into your hands, and work it into your hair from the ends.

If your scalp tends to be oily, stop rubbing the oil in an inch or two before you reach your scalp.

Sleep with the infused herbal hair oil on your hair, letting the herbs do their magic overnight.

Using Poly herbal hair oil for hair works wonders to tame dry and frizzy hair. It smooths down the cuticle without leaving your hair greasy since you wash it out in the morning.

Waking up to smooth, silky, shiny, and lovely-smelling hair is a great way to begin your day!

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