

**A REVIEW ON HERB BASED MEDICATION FOR THE TREATMENT OF ALOPECIA**

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Alopecia is the medical term for hair loss or baldness. It is a health condition in which hair is lost from some or all areas of the body, usually from the scalp. Hair loss can be caused due to different reasons, such as genetic tendencies, environmental triggers, exposure to chemicals, medicines, nutritional deficiency, extreme stress or long illness etc. On the basis of hair loss pattern and causes, alopecia is classified into several categories. The two major forms i.e. Alopecia areata and Androgenetic alopecia are of main concern. At present a number of synthetic remedies like Corticosteroids, dithranol, tretinoin, minoxidil, zinc, systematic Cortisone, irritants, immunosuppressive drugs, finasteride, azelaic acid are available for the treatment of Alopecia (both Androgenetic and Areata), but not a single or multiple drug therapy is giving satisfactory and permanent results to the Alopecia patients. Besides, a number of side effects are associated with the use of these synthetic compounds, including erythema, scaling, pruritis, dermatitis, itching, etc. So to cope with the problem of Hair loss, here we have looked into the Nature's treasure and found a number of herbs with proven records for the treatment of alopecia. Nutritional support, DHT blockers and 5- $\alpha$ Reductase blockers, Aromatherapy and improved scalp blood circulation are the proposed mechanisms of action for these herbal remedies. Being natural drugs there are many advantages of using them like patient compliance, less side-effects, easy availability, low-cost and more than one mode of action for treatment of Alopecia.

**KEYWORDS:** Alopecia, Alopecia areata, Alopecia androgenetic, DHT blocker, Nutritional support, Aromatherapy.

**INTRODUCTION**

Hair is one of the vital parts of the body derived from ectoderm of skin, is protective appendages on the body and considered accessory structure of the integument along with sebaceous glands, sweat glands and nails. They are known as epidermal derivatives as they originate from the epidermis during embryological development. Hair is an important of the overall appeal of the human body. Alopecia, a dermatological disorder that has been recognized for more than 2000 years is a common problem in cosmetics as well as primary health care practice. It is common throughout the world and has been estimated to affect between 0.2 % and 2% of the world population. A synthetic drug like minoxidil is a potent vasodilator and scientifically proved for the treatment of alopecia. But the use of these synthetic drugs are associated with many adverse events and generally not advisable for safe and effective treatment of alopecia, so the drugs of natural origin are necessary to replace the synthetic one and reduce the adverse effects associated with them. Hence this review article is presented compiling all the updated information on natural herbs exhibiting potent action against alopecia along with the mechanism of actions. Alopecia is the medical term for hair loss or baldness. There are various causes for Alopecia such as genetic tendencies<sup>[1]</sup>,

environmental triggers, exposure to chemicals, medicines, nutritional deficiency, oxidative stress<sup>[2]</sup> or long illness etc There are various types of alopecia but the two types of major concern are Alopecia areata and Androgenetic alopecia.<sup>[3]</sup>

**Androgenetic alopecia: (male /female pattern baldness)**

Androgenetic Alopecia can occur in both men and women and is characterized by the loss of hairs in defined pattern. In women Androgenetic Alopecia appears as diffuse hair loss occurring over most of the scalp. In men however the pattern of loss usually starts with a receding hairline which then advances to thin the top of the head.<sup>[4-6]</sup>

**Alopecia areata**

Alopecia Areata is a highly unpredictable, common autoimmune skin disease resulting in the loss of hair on the scalp and elsewhere on the body. It usually starts with one or more small, round, smooth patches on the scalp and can progress to total scalp hair loss (alopecia totalis) or complete body hair loss (alopecia universalis). Alopecia universalis is the rarest form of Alopecia areata. In all forms of alopecia areata, the hair follicles remain alive and are ready to resume normal hair production whenever they receive the appropriate signal.

In all cases, hair regrowth may occur even without treatment and even after many years. Besides presence of a number of synthetic remedies like cortocosteroids, dithranol, tretinoin, minoxidil, zinc, systematic Cortisone, irritants, immunosuppressive drugs, finasteride, azelaic acid for the treatment of Alopecia (both Androgenetic and Areata), no single or multiples drug therapy is giving satisfaction to the Alopecia patients. The side-effects associated with the use of these synthetic compounds includes erythema, scaling, pruritus, dermatitis, itching or skin rash. Sunburn should be avoided while using minoxidil as some dermatologists have suggested minoxidil exacerbates the tissue damage. Rare events include; acne at site of application, burning of the scalp, increased hair loss, inflammation or soreness at root of hair, reddened skin, swelling of the face, and an intolerance to tobacco. So to cope with the problem of Hair loss, here we have looked into the Nature's treasure and found a number of herbs with proven records for the treatment of alopecia. Being natural drugs there are many advantages of using them like patient compliance, less side-effects and more than one mode of action for treatment of alopecia. The herbs used in the treatment of alopecia provide one of the following:

1. Nutritional support
2. DHT blockers and 5- $\alpha$ -Reductase blockers.
3. Aromatherapy and improved scalp blood circulation<sup>[24]</sup>

#### Nutritional support

Minerals such as calcium, iron, copper, chromium, iodine, zinc, and magnesium are necessary to maintain

healthy hair growth. Mineral deficiency will reduce the chance to regulate the blood circulation that promotes healthy hair growth and thyroid hormones that prevent dry hair and hair loss as well as defects in hair color. Too much iron is toxic to your body. Be sure to talk to your doctor before taking any mineral supplement.

B vitamins (especially B6, B3, B5 and folic acid), biotin (anti-oxidant, sources of biotin are: whole grains, egg yolks, liver, rice and milk. Vitamin A is important for over-all good health. It's also beneficial to hair follicles, as it keeps the hair root lubricated. Vitamin E acts as an antioxidant that aids effective circulation in the scalp due to increased oxygen uptake in blood, therefore it plays an important role in promoting hair growth and preventing hair loss. Coenzyme Q10 (CQ-10) is an essential vitamin that provides our body with the nutrients needed to grow healthy hair. They also promote overall vitality, and contribute to beautiful skin and strong nails. Yogurt and soy, dark green vegetable, whole grain products, essential fatty acid, nuts and seed are fatty foods which are typically the best sources of vitamin E, an immune enhancing antioxidant and nerve protector. Carrots contain high amounts of vitamin A. It is an antioxidant that helps produce healthy sebum in the scalp. Having too much vitamin A can lead to hair loss. There are many other foods that help promote hair growth and prevent hair loss, such as fruits, egg, spinach, and broccoli. The various herbs providing nutritional support are summarized below in table 1.

**Table 1: Herbs providing nutritional support in the treatment of alopecia.**

Biological source	Family	Common name	Part used	Chemical constituent	Action
Aloe barbadensis	Liliaceae	Aloe vera	Leaves	Minerals	Nutritional support
Amaranthus spinosus L.	Amaranthaceae	Bathua	Seeds, leaves	Fe, Cu, Zn & other Minerals	Nutritional support
Avena sativa	Poaceae	Wild Oats	Seeds Carbohydrates,	Fibers, Fe, Zn and Mn	Nutritional support
Bacopa monniere	Scrophulariaceae	Brahmi	Entire plant	Triterpenoids saponins, bacosides	Nutritional support and nerve stimulant
Cajanus cajan	Fabaceae	Pigeon pea	Seeds	Protein, starch & minerals	Nutritional support
Daucus carota L.	Apiaceae	Carot	Roots	B-carotene, antioxidants & minerals	Nutritional support
Juglans regia L.	Juglandaceae	Akhrot	Fruits	Fe, Cu, Mn, Zn, K, proteins and fats	Nutritional support
Lactuca sativa L.	Asteraceae	Lettuce	Leaves	Vit. A & folic acid	Nutritional support
Medicago sativa	Fabaceae	Alfalfa	Leaves	Proteins, Calcium, Minerals & Vitamins	Nutritional support

Pelvetia canaliculata	Fucaceae	Channelled wrack	Brown algae	Isoflavones	Antioxidant action like Vit. E
Phyllanthus embelica	Euphorbiaceae	Amla	Fruit	Gallic acid, Vit. C, Quercetin	Nutritional support
Prunus amygdalus	Rosaceae	Badam	Seed oil	Vit B1, B2, B3, minerals, Vit. E, fats	Nervine tonic

### DHT blockers and 5- $\alpha$ -Reductase blockers

After knowing the well established role of DHT in hair loss, it is recommended that the use of herbs that have pronounced DHT or 5- $\alpha$ -Reductase blocking activity can be used for the treatment of alopecia (especially androgenetic). There are some herbs that have proved DHT blocking activity like *Pygeum africanum*, *Senecio repens*, *Urtica dioica* and others with potential 5- $\alpha$  Reductase inhibiting ability like *Camellia sinensis*, *Panax ginseng* etc (table 1.)<sup>[7-10]</sup>

### Aromatherapy

Aromatherapy can be used as a supplement to treat alopecia. It uses highly concentrated extracts which are derived from the flowers, leaves, bark and the roots of

various plants like *Arnica montana*, *Cedrus atlantica*, *Lavandula agustifolia*, *Oscimum sanctum*, *Pilocarpus jaborondi*, *Rosmarinus officinalis*, *Thyme vulgaris* etc., (table 2). In aromatherapy, the essential oils enter the body through the olfactory system (inhalation) and/or through your skin. As with herbs that are taken orally, the essential oils reach the circulatory system (the blood) where they bind to receptors and change the chemical composition. These oils work not only on a cellular level to strengthen/calm the nervous system, but also on a spiritual one, providing with a sense of well being. Topical herbal therapy stimulates hair follicles and it is proved as safest way to cope up with different type of hair loss (alopecia), however perfect pharmacological actions of these herbs and oils are yet not known.

**Table 2: Herbs for alopecia with their mode of actions.**<sup>[11-26]</sup>

Biological source	Family	Common name	Part used	Chemical constituent	Action
Arnica Montana	Asteraceae	Mountain tobacco	Flowers	Terpenoids	Aromatherapy
Cedrus atlantica	Pinaceae	Cedarwood	Wood chips & saw dust	Terpenoids	Aromatherapy
Lavandula agustifolia	Lamiaceae	Lavender	Flowering tops	Terpenoids	Aromatherapy
Oscimum sanctum	Lamiaceae	Tulsi	Whole plant	Terpenoids	Aromatherapy
Pilocarpus jaborondi	Rutaceae	Jabarondi	Leaves	Terpenoids	Aromatherapy
Rosmarinus officinalis	Lamiaceae	Rosemary	Flowering tops	Terpenoids	Aromatherapy
Thyme vulgaris	Lamiaceae	Thyme	Flowering tops & leave	Terpenoids	Aromatherapy
Allium cepa L.	Alliaceae	Onion	Cloves	Allicin, Vit. C Scontaining compds., minerals	Stimulates hair regrowth
Allium sativum L.	Alliaceae	Garlic	Cloves	Allicin, Vit. C Scontaining compds., minerals	Anti-microbial & nerve stimulation
Camellia sinensis	Theaceae	Tea	Leaves	Catechins, epicatechins, caffeine, & other tannins	5- $\alpha$ reductase inhibitor
Capsicum annum	Solanaceae	Pepper	Fruits	Capsiacin and isoflavones	Nerve stimulation and production of IGF-I
Eclipta alba (L.)	Asteraceae	Bhringraj	Leaves	Ecliptasaponin	Follicular

Hassk				C, daucosterol, stigmasterol-3-Oglucoside	enlargement and prolongation of Anagen phase
Ginkgo biloba	Ginkgoaceae	Ginkgo	Leaves	Flavonoids glycosides, terpenoids	Increases cerebral microcirculation
Panax ginseng	Araliaceae	Ginseng	Roots	Ginsenosides, phytoestrogens & Minerals	5- $\alpha$ reductase inhibitor
Pygeum africanum	Rosaceae	Pygeum	Dried bark	Ferulic acid esters (ndocosanol and tetracosanol)	Lower down DHT levels
Zanthoxylon rhetsa (Roxb.) DC.	Rutaceae	Indian Ivy Rue, Cape Yellowwood	Seeds	Zanthoxylin, vol. oils	Enhances microcirculation in scalp
Polygonum multiflorum	Polygonaceae	Fo-Ti, He Shou Wu	Roots	Glycosides, antioxidants	Nutritional support

### Few herbal preparations and method of application for the treatment of alopecia

#### *Ginkgo biloba* (Ginkgoaceae)

Chemical constituents: Ginkgolides A, B, C, J, M, bioflavin, sitosterol, lactones and anthocyanins. Mode of Application: The drug is extracted in coconut oil and is massaged for at least 2 minutes. Reason: The drug is known to improve cerebral microcirculation and hence increases oxygen supply.<sup>[21]</sup>

#### *Phyllanthus embelica* (Euphorbeaceae)

Constituents: Vitamin C, phyllembin, tannin, phosphorous, iron, calcium.

Mode of application: Indian gooseberry oil, prepared by boiling dry pieces of Indian gooseberry in coconut oil, is considered a valuable hair tonic for enriching hair growth. A mixture of an equal quantity of fresh Indian gooseberry juice and lime juice, used as a shampoo also stimulates hair growth and prevents hair loss.

Reason: Iron is involved in the oxygenation of your body's red blood cells. It is essential for normal hair growth and maintaining healthy hair. If the amount of iron cannot be replaced with food intake, iron deficiency will cause hair loss because of oxygen deficiency.

#### *Allium cepa* L. (Liliaceae)

Constituents: Protein (albumin), allyl propyl disulphide, diallyl sulphide, alliin, allicin. It also contains some mineral like potassium, zinc, calcium, magnesium and traces of chromium. Mode of application: Onion has also been found beneficial in patchy baldness. The affected part should be rubbed with onion juice morning and evening till it is red. It should be rubbed with honey afterwards.

Reason: Zinc helps to secrete the scalp with much needed oil and avoid dandruff that may cause hair loss. Iron is involved in the oxygenation of your body's red blood cells. It is essential for normal hair growth and maintaining healthy hair.<sup>[13]</sup>

#### *Rosmarinus officinalis* (Labiatae) and *Lavandula angustifolia* Miller (Labiatae)

Constituents: Rosmary constitutes 1-2% 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. The chief constituents of lavender oil are Lavenanol, linalyl acetate, linalol, lavendulyl acetate, terpineol and cineol.

Mode of application: These oils were massaged into the scalp for a minimum of 2 minutes daily for seven months.

Reason: The essential oils enter your system through the olfactory system (inhalation) and/or through your skin and reach your circulatory system (the blood) where they bind to receptors and change the chemical composition. Topical herbal therapy stimulates hair follicles and it is proved as safest way to cope up with different type of hair loss (alopecia), however perfect pharmacological actions of these herbs and oils are yet not known.<sup>[12]</sup>

#### *Juglans regia* L. (Juglandaceae)

Constituents: Fatty acids, linoleic acid (50.58 - 66.60%) are the predominant fatty acid followed by oleic acid (14.88 - 28.71%) and linolenic acid (9.16 - 16.42%). The other fatty acids were found in trace contents. The macronutrient contents of walnut are 100 g-1 for K (911.0 - 684.3), P (434.7 - 356.2), Ca (756.7 - 388.2), Mg (444.0 - 330.8) and Na (48.9 - 26.1) while micronutrient contents of walnut are Fe (6.6 - 4.3), Cu (2.8-1.8), Mn (5.7 - 2.7) and Zn (4.3-2.7). The potassium contents were found to be higher than those of the other minerals in all kernels of the walnuts.

Mode of application: The application of walnut oil all over the scalp and massaging it into the hair roots is also beneficial in the treatment of hair loss. It nourishes the hair and promotes hair growth.

Reason: The fruit contains essential minerals which are helpful in the growth of healthy hair. Iron increases

blood circulation and oxygen supply as stated earlier. Zinc helps to secrete the scalp with much needed oil and avoid dandruff that may cause hair loss. In case of Copper, study shows that these tripeptide complexes may actually be able to regrow hair, even in patients with total hair loss due to alopecia. Healthy tissue concentrations of copper lies between 1.7 and 3.5 milligrams.<sup>[27]</sup>

#### ***Glycyrrhiza glabra* Linn** (Leguminosae):

Constituents: The chief constituents are glycyrrhizin, potassium and calcium salt of glycyrrhizinic acid.

Mode of application: The paste of liquorice, made by grinding the pieces in milk with a pinch of saffron, is another valuable remedy for patchy baldness. This paste should be applied over the bald patches at night before going to bed.

Reason: The extract of liquorice has proved to possess constituents which promote growth of hair.<sup>[27]</sup>

#### **CONCLUSION**

The condition of hair has been the centre of attention of human civilization since ancient times. Alopecia is one of the major problems amongst urban people due to subjection to stress, environmental problems, etc. So with the help of this review article, we conclude that there are many herbal drugs having potency for curing alopecia with no sides effect. These herbal extracts having multiple phytoconstituents can treat alopecia either by providing nutritional supplements or by acting as DHT and 5- $\alpha$ -Reductase blockers. There are also few natural treasures having volatile oil active constituents which can be used as aromatherapy for treating alopecia by improving scalp blood circulation.

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