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KESHARAJA: HAIR VITALIZING HERBS

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ABSTRACT : Hair suffers aggression ; there can be some ailments to normal health of hair and cause trouble. The main problems associated with hair such as pigmentation problems (Fading) , dandruff and falling of hair (Shedding). Shedding of hair is a common and ever increasing problem in cosmetics as well as primary health care practice. It is a universal problem, having affected both sexes of all races to different extents for as long as mankind has existed. The herbs used in the hair care have a definite history in the system of Ayurveda. About 1000 kinds of plant extract have been examined with respect to hair growth. This review describes the use of some natural products for hair growth promotion, plant parts used, chemical composition, the active responsible for effect and with a brief description of major use.

KEY WORDS : Hair , Alopecia , Medicinal Plant , Herbal Formulation.

INTRODUCTION

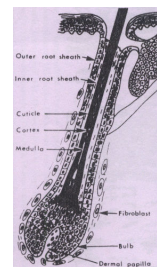
Hair is one of the vital parts of the body derived from ectoderm of the skin, is protective appendages on the body and considered accessory structure of the integument along with sebaceous glands, sweat glands and nails¹. They are also known as epidermal derivatives as they originate from the epidermis during embryological development²⁻⁴.

Each hair grows in three cyclic phases :

1. Anagen (Growth phase) –

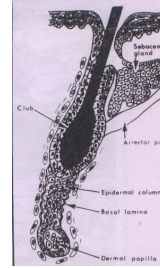
The anagen phase can be as short as 2 years to as long as 8 years.

Approximately 80% of hair is usually in anagen phase.



2. Catagen (Involution) -

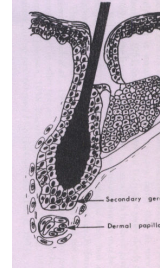
In the catagen phase, the growth activity ceases and hair moves to the next phase, catagen phase is between 10-14 days.



3. Telogen (Resting phase) -

The Telogen phase is a state at which the hairs move into resting state.

This phase lasts for 90-100 days⁵.



In general, 50-100 hairs at random are shed everyday. An increase of more than 100 hair per day constitutes a state of hair loss or alopecia, albeit it could be temporary⁶.

Ayurveda has described hair disease in three words, which are as under

1. **Khalitya** : Means loss of hairs
2. **Palitya** : Means prematured hair graying
3. **Indralupta** : Means alopecia areata, totalis, universalis⁷⁻⁸

Various factors contribute to hair fall / loss. Genetic predisposition and hormonal factors predominantly contribute to the above. Various disease state such as typhoid, malaria, jaundice etc., also cause hair fall, although temporarily. The use of chemotherapeutic agents also cause hair fall⁶. The telogen/ anagen effluvium is considered to be the reason for hair fall / loss. Hair fall/ loss cause a very stressful state of mind for hair fall sufferers. In females, the hair fall causes a major concern especially in India. Androgens are considered to be one of the most important causes for alopecia apart from a variety of other factors⁹.

The patents claim that the effect are due to stimulation of the hair follicle or scalp metabolism, possibility due to an acceleration of blood circulation, activation of dermal papilla, antitestosterone action or increased nutrition to the hair follicles through accelerated blood flow but the mechanism are not yet clear¹⁰⁻¹¹.

Natural products in the form of herbal formulations are available on the market and are used as hair tonic, hair growth promoter, hair conditioner, hair-cleansing agent, antidandruff agents, as well as for the treatment of alopecia and lice infection¹².

A number of herbal products have been acclaimed with hair growth- promoting activity¹³. The traditional system of medicine in India acclaims a number of herbal drugs for hair growth promotion. The article present a review of those used more frequently.

1. *Hibiscus rosa-sinensis* Linn (Malvaceae)

Parts used : Leaves & Flowers

Chemical constituents :

Flavonoids; Anthocyanins and Cyaniding-3,5-diglucoside, Cyaniding-3-sophoroside-5-glucoside, Quercetin-3,7-diglucoside, Quercetin-3-diglucoside¹⁴.

It is a glabrous shrub widely cultivated in the tropics. It is well accepted that the leaves and flowers of *Hibiscus rosa-sinensis* have hair growth promoting and antigreying properties¹⁵⁻¹⁶. In India, the herbal products in the market intended for hair growth include the extract of various parts of *Hibiscus rosa-sinensis*. Adhirajan et al. reported that the leaf extract of *Hibiscus rosa-sinensis* has a potential effect on maintaining the hair growth in-vivo and in-vitro methods¹⁷.



2. *Cuscuta reflexa* Roxb (Convolvulaceae)

Part used : Stems

Chemical constituents :

Cuscutin, Cuscutalin, β -Sitosterol, Luteolin, Bergenin & Kaempferol¹⁸.

It is a leafless, twinning, parasitic dodder with slender long yellow stems distributed in tropical and temperate region and common throughout India. It is commonly known as amarbel. Dixit et al. reported hair growth activity of *Cuscuta reflexa* Roxb. Stem through the periodic transformation of hair follicle from telogen to anagen phase¹⁹.



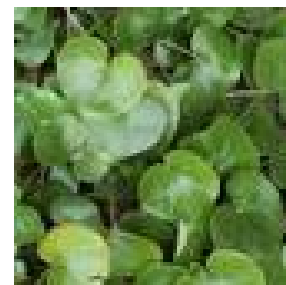
3. *Asiasari radix* (Aristolochiaceae)

Parts used : Roots & Rhizomes

Chemical constituents :

Safrole (18.4%), Methyl eugenol (18%), 3-methoxytoluenes & 3-benzodioxole derivatives²⁰.

Asiasari radix is the root and / or Rhizome of *Asiasarum heterotropoides* (Aristolochiaceae). Rho et al. suggested that the *Asiasari radix* extract has hair growth promoting potential, and this effect may be due to its regulatory effects on both cell growth factor gene expression²¹.



4. *Ocimum gratissimum* Linn (Lamiaceae)

Part used : Leaves

Chemical constituents :

Essential oil : Eugenol, Carvacrol, Nerol & Eugenol methyl ether²².

It is an herb found throughout India. Orafidiya et al. investigated the efficacy of the leaf essential oil of *Ocimum gratissimum* Linn. (Ocimum oil) in promoting hair growth in cyclophosphamide-induced hair loss and concluded that ocimum oil may be capable of enhanced normal hair growth and promoting follicular proliferation in cyclophosphamide-induced hair loss²³.



5. *Ginseng radix* (Araliaceae)

Parts used : Roots & Stems

Chemical constituents :

Ginsenosides, Essential oil : Sesquiterpenes, Polyacetylenes, Polysaccharides, peptidoglycans, Steroid, Choline, Vitamin- B, C, E, Fatty acid, Carbohydrates, Amino acids²⁴.

It is an important crude drug that has been used from ancient time to improve constitutional tendencies to poor body condition, to promote appetite, to



increase vitality and to reduce over sensitivity to cold. Matsuda et al. indicated that *Ginseng radix* possesses hair growth promoting activity and that G-Rb1, may be one of the active constituents of *Ginseng radix* in the mouse vibrissal hair follicle organ culture model²⁵.

6. *Aloe vera* L. (Liliaceae)

Part used : Leaves

Chemical constituents :

Barbaloin (15-40%), Hydroxyaloin (3%), Mucilage (Glucose, Galactose, Mannose, Galacturonic acid), Aloe-emodin, Aloesone, Aloctin A and B²⁶.

Aloe vera L. or *A. barbadensis* gel is used traditionally for hair loss and for improvement in

hair growth following alopecia. Inaoka et al. reported that aloenin is the major constituent responsible for promoting hair growth without irritating the skin²⁷.



7. *Rosmarinus officinalis* Linn (Labiatae)

Parts used : Leaves & Flowers

Chemical constituents :

Volatile Oil (1-2%) : Borneyl acetate, Borneol, Cineole, Camphene, α -pinene, Rosemarinic acid, α & β amyryns, Betulins & β -Sitosterol²⁸.

It is an aromatic herb surrounded by tradition and legends but with improvement

culinary, medicinal and cosmetic properties. In folk medicine it is used to stimulate growth of hair as a rinse.

Rosmarinic acid have antioxidant effect²⁹.



8. *Lawsonia alba* L. (Lythraceae)

Parts used : Leaves & Seeds

Chemical constituents :

Coumarins, Naphaquinones (Lawson), Flavonoids, Sterols, Tannins, Xanthones, Laxanthones & β -ionone of the essential oil³⁰.

It has been cited as a growth accelerator and was used in an ancient Egyptian formula to cure the loss of hair.

The incidence of contact dermatitis appears to be extremely rare with the use of henna. Henna leaf have anti-inflammatory & antiallergic effect³¹.



9. *Ginkgo biloba* (Ginkgoaceae)**Part used :** Leaves**Chemical constituents :**

Lactones (6%) : Diterpenoids , Ginkgolides A, B, C, Bilobalide-A, Flavonols (24%) : Kaempferol, Quercetin, Isorhamnetin³² .



Kobayashi et al. investigated that *Ginkgo biloba* leaf extract promote hair regrowth, through combined effects on proliferation and apoptosis of the cells in the hair follicule thus suggesting potential as a hair tonic³³ .

10. *Tridax procumbens* L. (Compositae)**Part used :** Leaves**Chemical constituents :**

Flavonoid : Procumbenetin³⁴ , 1.7% Fumaric acid, β -sitosterol, Alkalodies, Tannin³⁵ , Luteolin, Glucoluteolin, Quercetin, Isoquercetin³⁶ .



Tridax procumbens L. is found as weed throughout India. Pathak et al. investigated hair growth promoting activity of *Tridax procumbens* promotes the growth of hair³⁷ .

11. *Sophora flavescens* (Leguminous plants)**Part used :** Roots**Chemical constituents :**

Alkalods: Oxymatrine, Matrine, Losmatrine, Sophoranol, Sophocarpine, Bioflavones : Norkurarinone, Kuraridinol, Sophoraflavanone, Formoronetin & Fatty acids³⁸ .



Roh et al. found that the extract of dried roots *Sophora flavescens* has out standing hair growth promoting effect. *Sophora flavescens* extract induced mRNA levels of growth factors such as IGF-1 and KGF in dermal papilla cells, suggesting that the effect of *Sophora flavescens* extract on hair growth may be mediated through the regulation of growth factors in dermal papilla cells. In addition the *Sophora flavescens* extract revealed to possess potent inhibitory effect on the type II 5 Y-reductase activity³⁹ .

12. *Citrullus colocynthis* Schrad (Cucurbitaceae)**Part used :** Fruits

Chemical constituents :

Resinous Glycosides (Colocynthin & Colocynthitin), Phytosterol Glycoside, Citrullol, Pectin, Albuminoides, Cucurbitacins-Cucurbitacin E & I⁴⁰.

Dixit et al investigated of *Citrullus colocynthis* promotes the growth of hairs. Also found least hair growth initiation and completion time, maximum number of hair follicles in

anagenic phase. 5 α -Reductase has been implicated as one of the major causes of hair loss. It may be rewarding if studies tounfold the mechanism of action of herbal extracts are undertaken using this bed⁴¹.

**13. Emblica officinalis (Euphorbiaceae)**

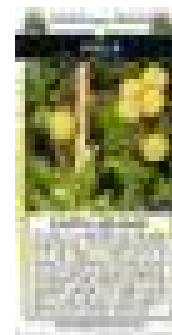
Part used : Fruits

Chemical constituents :

Alkaloids (Phyllantidine, Phyllantine), VitaminC, Gallotannis (5%), Carbohydrates (14%), Pectin, Minerals, Phenolic acid, Gallic acid, Ellagic acid, Phyllemblic acid, Emblicol, Amino acid (Alanine, Aspartic acid, Glutamic acid, Lysine, Proline)⁴².

Gupta et al investigated increase in hair growth acivity of *Emblica officinalis* . It holds the promise of potent herbal alternative for minoxidil. Also suggest excellent results of hair

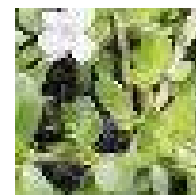
growth in formula prepared by cloth pouch boiling method{*Emblicaofficinalis*(Euphorbiaceae), *Bacopa monnieri* (Scrophulariaceae), *Trigonella foenumgraecum* (Leguminosae), *Murraya koenigii* (Rutaceae)}⁴³.

**14. Bacopa monnieri (Scrophulariaceae)**

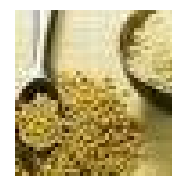
Part used : Whole Plant.

Chemical constituents :

Alkaloids (Brahmine, Herpestine), Saponins (Monnierin, Hersaponin, Bacoside A, A₃, B), Steroids (Stigmasterol, β -Sitosterol)⁴⁴.

**15. Trigonella foenumgraecum (Leguminosae)**

Part used : Seeds.



Chemical constituents :

Flavonoids: Quercetin, Luteolin, Saponins : Diosgenin, Tigogenin, Gitogenin, Trigonelline, Protein (26%), Fats(6%), Carbohydrates: Galactomannan (44%)⁴⁵ .

16. *Murraya koenigii* (Rutaceae)

Part used : Leaves

Chemical constituents :

7,4¹-diOMe Vitexin, 4¹-OMe Kaempferol, Vanillic acid, Syringic acid, p-coumaric acid⁴⁶ .

**17. *Nardostachys jatamansi* (Valerianaceae)**

Parts used : Rhizomes & Roots.

Chemical constituents :

Volatile Essential Oil (0.5-2%) : Jatmansone, Sesquiterpenoid(0.02-0.1%), Spirojatamol, Patchouli alcohol, Jatamol A & B, Jatamansic acid, Nardostachone, Nardol⁴⁷ .



It is erect perennial herb, Grows in watery land and in south Himalays. Ali et al reported that *Nardostachys jatamansi* having hair growth activity⁴⁸ .

18. *Eclipta alba* (L) Hassak (Asteraceae)

Part used : Whole plant

Chemical constituents:

Flavonoids & isoflavonoids : Wedelolactone, Desmethylwedelolactone, Triterpene glycosides & Saponins : Eclalbasaponins I-VI, β -amyrin⁴⁹ .

It is a common weed growing throughout India on waste ground. Thakur et al investigated that β -sitosterol and wedelolactone responsible for hair growth activity.



5α -reductase inhibition contributes in treatment of androgenic alopecia. 5α -reductase inhibition by β -sitosterol has been well documented in this study⁵⁰

Daniel et al also reported the following herbs for hair growth activity⁵¹ :

19. *Indigofera Tinctoria* (Papilionaceae)

Part used : Whole Plant

Chemical constituents :

Apigenin , Kaempferol, Luteolin, Quercetin⁵².



20. *Vitex negundo* Linn (Verbenaceae)

Part used : Leaves

Chemical constituents :

Aucubin aginuside, Alkaloids : Nishindine, Hydrocotylene, Glyoflavonoids, Orientin, Isoorientin, 5-Hydroxy, 3,6,7,3¹,4¹ pentamethoxy flavone⁵³.



21. *Terminalia bellerica* (Combretaceae)

Part used : Whole plant

Chemical constituents :

β -Sitosterol, Gallic acid, Ellagic acid, Ethyl gallate, Galloyl glucose, Chebulagic acid, Cardiac glycoside, Bellaricanin⁵⁴.



22. *Gmelina arborea* (Verbenaceae)

Part used : Fruits

Chemical constituents :

Gmelofuran, Gmelinol, Hentriacontanol, β -Sitosterol⁵⁵.



23. *Centella asiatica* Linn (Hydrocotylaceae)

Part used : Whole Plant

Chemical constituents :

Triterpenoid Saponins (Madecassoside 0.7-5% , Asiaticoside 0.1-0.6%), Aglycones (Asiatic acid 0.1-0.5%, Madecassic acid 0.5-0.8%)⁵⁶.



24. *Cardiospermum halicacabum* Linn (Sapindaceae)

Part used : Whole Plant



Chemical constituents :

Flavones (Apigenin, Acacetin, 7-O Me apigenin, 7,4¹-diOMe apigenin, 3¹,4-diOMe luteolin), Phenolic acid (Melitotic, *p*-coumaric, Ferulic acid), Cyanolipid⁵⁷

The herbs *T. procumbens* and *E. alba* belongs to the compositae family, found as weed through India and used in the indigenous system of medicine for the treatment of variety of human ailments, particularly liver disorders, wound healing and as hair growth promoters.

Dixit et al. investigated hair growth activity of a mixture of *Eclipta alba* hassk, *Citrullus colocynthis* shrad and *Tridax procumbens* Linn¹⁹.

Jain et al. investigated the hair growth activity of almond oil, til oil and coconut oil preparation containing ariel part of *Zizyphus jusaba*, *Cuscuta reflexa*, *Citrus burgamia*, *Lagenaria sicaraia*, *Hibiscus rosa-sinensis* and *Allieum cepa*, seed of *Trigonella foinum- graceum* and fruits of *Embelica officinalis*⁵⁸.

Following are the marketed herbal formulation..

Table 1 : Marketed Herbal Formulation⁵⁹

Sr. No.	Manufacture Formulation Content	Product name
1.	Amla, Bringgraj	Keshamrit Oil
2.	Bhringgraj, Godanti	Nutrich Capsule
3.	Vacha, Jevanti	Keshmitra Tablet
4.	Bhringgraj, Godanti	Nutrich Capsule
5.	Tulsi, Neem	Sidha Shampoo
6.	Chamomile, Rosemary	Regrow Massage Oil
7.	Amla, Bhringgraj	Saini Herbal Hair Conditioner
8.	Amla, Heena	Shyamla Shampoo
9.	Ashwagandha, Shatawari	Kesh Vardan Capsule
10.	Amla, Bhringgraj	Kesh Rakshe Oil
11.	Amla, Jatamansi	K-7 Taila Oil
12.	Brahmi, Bhringgraj, S. indicum	Hibril Oil
13.	Brahmi, Bhringaraj, L. innermis	Hairvit Oil
14.	Hibiscus rosa sinenis, E. alba, O. sanctum	Hairich Capsule & Oil
15.	Amla, Bhringaraj, Brahmi	Chirayu Herbal Oil
16.	Amla, Bhringaraj, Guduchi	Hairbac Tablets

CONCLUSION

Alopecia, a dermatological disorder that has been recognized for more than 2000 years. It is common problem that has affected men and women. It is investigated through many treatment are on offered including natural or synthetic based products , but natural product are continuously gaining popularly and the use of plant extract in formulation. Because synthetics based product may cause human health hazard with several side effects. In the future it is possible that many new plants extract of commercial significance will be identified.

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