

Phcog Rev.:Short Review

Plants used for hair growth promotion: A review

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ABSTRACT

Hair loss 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. Herbal cosmetics are now emerged as the appropriate solution to the current problem, natural product are fancy in cosmetics and about 1000 kinds of plant extract have been examined with respect to hair growth and still it is a fast growing segment with a vast scope of manifold expansion in coming years. This review describe the use of some natural products for hair growth promotion, with a brief description of the major use, plant parts used, the active responsible for effect and the benefit of such product.

KEY WORDS : - Hair care, Natural, Herbal formulation, Medicinal plant, Alopecia.

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 nails (1). They are also 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 (2-4).

Alopecia is a dermatological disorder that has been recognized for more than 2000 years. It is a synonym of baldness, involves absence or loss of hair, especially of the head (5). It is common throughout the world and has been estimated to affect between 0.2% and 2% of the world population. Alopecia has also been observed as major side effect of anticancer drugs, immunosuppressant and many other drug treatments. Mental shock, emotional strain, focal infection, errors of refraction, endocrine disturbance, neuro-circulation instability and genetic predisposition are also the known cause of alopecia (6). Ayurveda has described hair disease in three words, which are as under (7-8).

Khalitya : Means loss of hairs

Palitya : Means prematured hair graying

Indralupta :Mean alopecia areata, totalis, universalis

The search for treatment results into few drugs of synthetic origin, but side effects associated with them can not be neglected. Herbal drugs or their formulation are viable alternative to synthetic drugs. Natural remedies have been used for centuries for treating alopecia (9-11). In traditional Indian system of medicine many plants and herbal formulations are reported for hair growth promotion as well as improvement of quality of hairs (12). About 100 hair growth products are available in the markets which are prepared by combination of one or more herbal drugs (13). Some of hair growth products available in the market are listed in table 1. Although they are currently widely accepted by the patient, their scientific respect among dermatologists in particular is limited. The alternative medicines seem promising, although their true effects are unknown so further

investigation must be performed. Recently, various plant extract have been patented for use in hair growth or hair tonic products, and for prevention of alopecia. 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 clear(14-15). The article present a review of those used more frequently.

Hibiscus rosa-sinesis Linn. (Malvaceae) is a glabrous shrub widely cultivated in the tropics. It is well accepted that the leaves and flowers of *Hibiscus rosa-sinesis* have hair growth promoting and antigreying properties (16-17). Moreover in India, the herbal products in the market intended for hair growth include the extract of various parts of *Hibiscus rosa-sinesis*. Adhirajan *et al.* reported that the leaf extract of *Hibiscus rosa-sinesis* has a potential effect on maintaining the hair growth in *in-vivo* and *in-vitro* methods(18).

Tridax procumbens L. (Compositae) is a weed found throughout India. The plant is known to local people as "Ghamara" and is dispensed for "Bhringraj" by some of the practitioners of Ayurveda (19). Pathak *et al.* investigated hair growth promoting activity of *Tridax procumbens* and concluded that ethanolic extract of *Tridax procumbens* promotes the growth of hair. Therefore the dispensing of this plant by some practitioners of Ayurveda for "Bhringraj" is justifiable (20).

Cuscuta reflexa Roxb.(Convolvulaceae) 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 phase. However, the exact mechanism of hair growth stimulation is not known and further studies are a perquisite in order to evaluate the exact mechanism behind hair growth

Table No. 1 : Marketed herbal formulation

Sl.No.	Product name	Manufacture	Formulation	Content
1	Chirayu Herbal	Chirayu	Oil	Amla, Bhringaraj, Brahmi
2	Hairbac	Bacfo	Tablets	Amla, Bhringaraj, Guduchi
3.	Hairich	Capro	Capsule & Oil	<i>H. roseus, E. alba, O. sanctum</i>
4.	Hairvit	Millennium	Oil	Brahmi, Bhringaraj, <i>L. innermis</i>
5.	Hibril	Vital Care	Oil	<i>S. indicum</i> , Brahmi, Bhringgraj
6.	K-7 Taila	Ajmera	Oil	Amla, Jatamansi
7.	Kesh Rakshe	JRK	Oil	Amla, Bhringgraj
8.	Kesh Vardan	Ratan	Capsule	Ashwagandha, Shatawari
9.	Keshmitra	Anjani	Tablet	Vacha, Jevanti
10.	Keshamrit	Ajmera	Oil	Amla, Bhringgraj
11	Medhavi	Ajmera	Oil	Amla, Bhringgraj, Brahmi
12	Nutrich	Ayulabs	Capsule	Bhringgraj, Godanti
13.	Shyamla	Vasu	Shampoo	Amla, Heena
14.	Saini Herbal Hair Conditioner	Saini	Conditioner	Amla, Bhringgraj
15.	Regrow	Avolado	Massage Oil	Chamomile, Rosemary
16.	SidhaShampoo	Surya labs	Shampoo	Tulsi, Neem

stimulation (21).

Asiasari radix is the root and/or rhizome of *Asiasarum heterotropoides* F. (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 and growth factor gene expression (22).

Roh *et al.* found that the extract of dried roots of *Sophora flavescens* has outstanding 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 α -reductase activity (23).

Ocimum gratissimum Linn. (Lamiaceae) 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 loss (24).

Lygodii spora (spore of *Lygodium japonicum* T., Schizaeaceae) is a Chinese medicinal herb found in China. Matsuda *et al.* investigated the hair growth activity of *Lygodii spora*. From the lipophilic constituent of *Lygodii spora*, oleic, linoleic and palmitic acids were identified as the main active principle inhibiting testosterone 5 α -reductase (25).

Ginseng radix is the steamed and dried root of *Panax ginseng*. 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 model (26).

Procyanidin B-2 is a protein kinase C (PKC) inhibitor, a compound identified in apple (*Malus pumila*) act as a growth-promoting factor on murine hair epithelial cells. Kamimura *et al.* suggested that procyanidin B-2, a compound that possesses hair-growing activity, causes modulation of the expression and translocation of PKC isozymes (α , β I, β II and η) in hair epithelial cells (27).

Proanthocyanidins are a species of phenolic compound that take the form of polymers or oligomers built of flavan-3-ol unit. Takahashi *et al.* reported that proanthocyanidins extracted from grape seeds promote proliferation of hair follicle cells *in-vitro* and they possess remarkable hair cycle converting activity from the telogen phase to the anagen phase *in-vivo*.

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 follicle, thus suggesting potential as a hair tonic (29).

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 skin. *Aloe vera* has been cited as treatment for brittle hair, but with no evidence to substantiate this claim (30).

Rosemary or *Rosmarinus officinalis* Linn. (Labiatae) 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. The most important constituents of rosemary are thought to be caffeic acid its derivatives such as rosmarinic acid; these compounds have antioxidant effect (32)

Henna or *Lawsonia alba* L. (Lythraceae) 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, since henna leaf extract have mild anti-inflammatory and antiallergic effect (33)

The leave and the fruits of *Thujae occidentalis* have been known as an oriental herbal medicine for the treatment of renopathy, leukotrichia and alopecia. Park *et al* demonstrated the inhibitory activity of *Thujae occidentalis* semen extract for 5 α -reductase type 2 and its biological action in two animal models, suggesting that TOS extract would be used as an effective agent for male pattern baldness by modifying androgen conversion. (34)

The herb *T. procumbens* and *E. alba* belongs to the compositae family, found as weed throughout 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. The herb *C. Colocynthis* from Cucurbitaceae family is a native of warmer part of Asia and Africa, occur wild throughout India. The fruits and roots of the plant were mainly used as purgative and blackening of hair. Dixit *et al.* investigated hair growth activity of a mixture of *Eclipta alba* hassk, *Citrullus colocynthis* shrad and *Tridax procumbens* Linn (35).

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 siceraria*, *Hibiscus rosasinesis* and *Allieum cepa*, seed of *Trigonella fojinum* graceum fruits of *Embelica officinalis* (36).

CONCLUSION

Alopecia is common problem that has affected men and women for years. It is still not fully understood and continues to be 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 is in rise. Because synthetic based product may cause human health hazard with several side effects. Looking at the increasing popularity of the herbal drugs in hair care, it should be worthwhile to take up systemic investigation on the efficacy of these drugs and their preparation. In the future it is possible that many new plants extract of commercial significance will be identified and claims of many wide spread herbs will be proven.

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