

Essential Oils against Dandruff: An Alternative Treatment

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ABSTRACT

Dandruff is the common scalp infection which is marked by the flaking of the skin of scalp. It affects almost all the age groups. It can be caused by the number of factors including dryness of scalp, sensitive to hair products and skin conditions such as psoriasis, seborrheic dermatitis, or eczema. The Overgrowth of yeast can also cause dandruff. It is commonly caused by the *Malassezia* (fungus) which feeds the nutrients of the scalp. There are antifungal agents such as creams, lotions, shampoos and drugs are also available but they are unable to prevent reoccurrence. So attention is shifting towards the essential oils which are famous for their antifungal activity. There are number of essential oils such as tea tree oil, peppermint oil, rosemary oil, thyme oil etc which shows the antimicrobial activities. The essential oils are extracted from the leaves, shoot, roots and flowers of the specific plants.

Keywords: Dandruff, Essential oils, *Malassezia*, Antifungal agents.

INTRODUCTION

Dandruff is the excessive flaking of the dead skin cells from the scalp. It is the common scalp disorder by which half of the population is affected. It is mostly occurs after the age of puberty and males are more affected than females¹. It may spread through redness, irritation and increasing scaling of scalp to seborrheic dermatitis and both of these conditions are examine to be the same disorder of different severity². The dandruff may fluctuate with season as it often more in winter. There are seven different sp. of *Malassezia*. These are *M. globosa*, *M. restricta*, *M. obtuse*, *M. sloofea*, *M. sympodialis*, *M. furfur* and *M. pachydermatits*³. Among these *M. furfur* is the main causative agent of the dandruff which lives on the scalp and feeds on the skin oils. Several times dandruff is the main cause of the hair fall.

CAUSE OF DANDRUFF

There are several causes of dandruff, including dry skin, not proper cleaning/scrubbing of head, sensitive to hair products, psoriasis, eczema, or yeast like fungus. Dry skin and *Malassezia* is the most common cause of flaking of the scalp³. As the epidermal layer continuously replaces itself, cells are pushed outward where they are finally die and flake off. For most individuals, these flakes of skin are too small to be visible. However, certain conditions cause cell turnover

to be unusually rapid, especially in the scalp. It is hypothesized that for people with dandruff, skin cells may mature and be shed in 2–7 days, as opposed to around a month in people without dandruff. The result is that dead skin cells are shed in large, oily clumps, which appear as white or grayish patches on the scalp, skin and clothes. There are antifungal agents and essential oils are available which are used against dandruff.

ESSENTIAL OILS FOR SUPERFICIAL DANDRUFF

Essential oils are highly volatile substance which are obtained either from the leaves, bark, flowers, roots etc. There are several methods are used for obtaining essential oils from plant parts such as water distillation, water and steam distillation, steam distillation, cohobation, maceration and enfleurage are the most traditional. There are wide variation in the chemical composition and yield of different essential oils which depends on the herbal source, chemotype of the plant species and analytical methods used⁴. The function of the essential oil in plants not well understood but most commonly they were used as a essence, perfumes, soaps, detergents, aroma, and as a flavoring agent for food products like bakery goods, confections, candies, pickles, soft drinks etc and most importantly they were also used in

pharmaceuticals as well as in the field of medical science⁵. Because of their numerous properties, several essential oils shows medicinal importance and they will shows antimicrobial activities so the present aim is to observe their antimicrobial activity against dandruff⁶.

TYPES OF ESSENTIAL OILS

Cinnamon oil is obtained from the bark of the plant *cinnamomum zeylanicum Blume*. It contains high constituent of cinnamaldehyde and euginol. This oil has numerous properties such as stimulant, aromatic, carminative and have powerful fungicide⁷.

Lavender oil is derived from the flowers of *Lavandula angustifolia* by steam distillation in Italy and France. It contains major constituents of Linalool and Linalyl acetate which shows antimicrobial activity.

Peppermint oil is derived from the leaves of *peppermint (hybrid of water mint and spear mint)* in Europe and South

America. It contains major constituents of methone and methol. It has a calming effect on the body, powerful antimicrobial agent, freshen bad breath etc.

Tea tree oil is obtained from the leaves and branches of *Malaleuca alternifolia* by steam distillation in the states of New South Wales and Australia⁸. It contains major constituents of Terpinen-4-ol which has strong anti-microbial and anti – inflammatory properties

Rosemary oil is derived from the leaves, flowers and buds of the *Rosmarinus officinalis* by steam distillation in Malayalam. The major constituents of the rosemary oils are 1,8-cineole, alpha pinena, camphor which makes it more effective.

Thyme oil is derived from the thymus vulgaris. It is extract from the fresh or partly dried flowering tops and leaves of the plant by water and steam distillation. It is used in the many reagonis of the world. Thyme oil could reduce the occurance of the dandruff.

Table 1: Essential oils and their sources

S. No.	Name of Essential Oil	Source	Plant parts used
1.	Cinnamon oil	<i>Cinnamomum zeylanicum blume</i>	Bark
2.	Tea tree oil	<i>Melaleuca alternifolia</i>	Leaves
3.	Lavender oil	<i>Lavandula angustifolia</i>	Flowers, leaves
4.	Peppermint oil	peppermint	Leaves
5.	Rosemary oil	<i>Rosarinus officinalis</i>	Leaves, flowers and buds
6.	Thyme oil	<i>Thymus vulgaris</i>	Flowers and leaves

ANTIFUNGAL DRUGS AND CREAMS FOR DANDRUFF

Antifungals are the molecules which are fight against the fungi. Now days, Fungal infections are very common infection in all the ages .if it is not treated at time it may converted into a serious diseases.. Fungi grow vigorously in moist, dark places including some parts of the body. It affects the mucous membrane and feeds on nutrients of the scalp and weakens the root hairs. So there are some antifungal drugs

and creams are available to cure it and easily available anywhere.

Antifungal drugs are work either by killing or inhibiting the growth of the fungal cells. For example if any substance affects the cell wall and leak out the content of fungal cell .It leads to the death of the cells. The antifungal drugs stop the growth and reproduction of the fungus.

Types of Antifungal Drugs

The antifungal drugs including ketoconazole, Clotrimazole, Terbinafine, Butenafine etc which are classified on the bases of their class.

Table 2: Drugs and their Mechanism of action

S. No.	Class	Antifungal agents	Mechanism of action
1.	Azole	Ketoconazole Fluconazole Clotrimazole Miconazole Bifonazole Climbazole Flutrimazole	Inhibition of fungal lanosterol 14- α dimethylase enzyme resulting in depletion of ergosterole and accumulation of toxic sterols in fungal cell membrane
2.	Allylamine	Terbinafine	Interfere with synthesis of ergosterol by inhibition
3.	Benzyleamine	Butenafine	Squalene 2,3- epoxidase that is responsible for converting squalene to squaline oxide

Antifungal creams and lotions are used to treat fungal infections of skin and scalp. These are cheap and easily available anywhere of different brands. These are applied on the infected

area of the scalp. Some examples of antifungal creams are Jessica, Himalaya, ketox, canoio-B, Canesten, D'free, ketonext AF etc

Table 3: Antifungal Creams and Lotions for Dandruff

S. No.	Name of cream or lotion	Constituents
1.	Parachute Advanced Antidandruff cream	Mineral oil, coconut oil, tea tree oil, neem oil, glycol, EDTA, methylparaben etc.
2.	Himalaya antidandruff cream	Tea tree oil, rosemary, sweet basil, coriander etc
3.	Khadi herbal antidandruff cream	Neem, tea tree oil eucalyptus etc
4.	D'free antidandruff lotion	Aqua, sesame oil, aloe barbadensis leaf juice, almond oil etc.
5.	Ducray squaratum antidandruff lotion	Zinc sulphate, azeleic acid, glycerine, tetrapeptide etc.
6.	J.F lazartique antidandruff cream	Aqua, zinc perithione, propylene glycol, tetrasodium EDTA, etc

Antifungal shampoos are the polyherbal formulations which are suggested for the dandruff treatment. It contains the extracts of numerous plants which help in the reduction of dandruff from the scalp. The most widely used treatment options are antidandruff shampoos⁹. There are some active ingredients such as

azole, hydroxypyridones, coal tar, salicylic acid, sulfur, selenium sulfide, and zinc pyrithione which inhibits the growth of *Malassezia* sp.¹⁰ Types of antifungal shampoos available in the market. For example Nizoral, arcolane, Selsun-blue, Polytar AF, Head & shoulder, ketosh etc.

Table 4: Antifungal shampoos

S. No.	Name of the shampoo	Active ingredients
1.	Nizoral	Ketoconazole 1%
2.	Acrolane	Ketoconazole 2%
3.	Selsun-blue	Selenium sulphide 1%
4.	Polytar AF	Tar + Zinc pyrithione
5.	Head & shoulder	Zinc pyrithione 1%
6.	ketosh	Ketoconazole + Zinc pyrithione

Limitations of the Antifungal agents

The antifungal agents include drugs, creams, lotions and shampoos. These agents contain antimicrobials like zinc pyrithione, selenium sulphide, salicylic acid imidazole derivatives etc.¹¹ These agents have some limitations also. The antifungal agents are unable to prevent reappearance of the dandruff which is the main problem. Most of the hair products contain zinc pyrithione because it shows antifungal properties. Recently study suggests that the

action of zinc pyrithione arises from iron starvation¹². Certain experiments have proposed that at low concentration, the fungus is capable to inactivate the pyrithione¹³. The antifungal drugs are also unable to inhibit the repetition of the dandruff. If these drugs are taken regularly, our body will be resistant to these drugs. The antifungal agents treat the dandruff completely while we are using it. After their stoppage, dandruff spread again on the scalp.

Advantages of the Herbal Essential Oils over drugs

The use of herbal essential oils and antifungal drugs can be a great advantage in the various disease treatment. The mixture of these have strong antifungal activity against *M. furfur* and other fungi. The herbal drugs which contain rhizome powder cured ringworm infection caused by *Trychophyton verrucosum* in 12 cattles and *Microsporum canis* in 21 dogs within 12 to 15 days of treatment¹⁴. In vitro, the combination of essential oils and drugs are applied on the culture by disk diffusion method.

CONCLUSION

Due to increasing attention in natural drug formation, standardization of essential oils have been developed. In this review paper, we conclude that essential oils were found to be very effective against scalp and dandruff infection instead of using allopathic drugs, creams and shampoos.

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