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Systematic Review on Herbs with Antidandruff Property

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Abstract: ***The most common problem in teenage and adult is of dandruff which is scientifically known as 'Malassezia' which if ignore can further continue with secondary symptoms like Acne, itching, discomfort etc. The present review highlighted the mechanism of 'Malassezia' along with the available treatment for it. Though the number of synthetic formulations available, the present review focuses on alterative and safe way to treat dandruff i.e. use of herbs with their biological source and constituents responsible for effectivity to solve the problem in broad population. Due to wide range of activity phytoconstituents like anti-inflammatory, antibacterial and antifungal, these synergistic effect may increase the applicability of herbs in cosmetics and cosmeceuticals as well. Hence the considering the need of herbal formulation development an attempt has been made to discuss about formulation commonly used to treat dandruff i.e. shampoo, different parameters of evaluation and invitro method evaluation of Antidandruff activity.***

Keywords: Malassezia, Antidandruff, Antidandruff agents, Evaluation, Dandruff, Scalp disease, Shampoos, Herbal shampoo, Natural ingredients, Hair, Dandruff, Cleansing action, Dirt removal.

I. INTRODUCTION

The world dandruff (dandruff, dandruff) is of Anglo saxon origin a combination of tan means tetter and drof meaning dirty thus we can call it as "itch-dirt" other name for this conditions are - Pityriasis simplex
Furfuracea
Capitis
It is fundamentally known by *Malassezia spp.* Malassezia (previously known as Pityrosporum) is a family of organisms. It is the sole sort in family Malasseziaceae, which is the main family all together Malasseziales, itself the single individual from class Malasseziomycetes.
Malassezia species are normally found on the skin surfaces of a large number creatures, including people. In periodic artful diseases, a few animal types can cause hypopigmentation or hyperpigmentation on the storage compartment and different areas in people. Sensitivity tests for these organisms are accessible. Distinguishing proof of Malassezia on skin has been supported by the utilization of atomic or DNA-based methods. These examinations show that the Malassezia species causing most skin illness in people, including the most widely recognized reason for dandruff and Seborrheic dermatitis Because of moderate changes in their terminology, some disarray exists about the naming and characterization of Malassezia yeast species.Work on these yeasts has been muddled on the grounds that they require explicit development media and fill gradually in research center culture.
Malassezia were initially distinguished by the French researcher Louis-Charles Malassez in the late nineteenth century. Raymond Sabouraud distinguished a dandruff-causing creature in 1904 and referred to it as "Pityrosporum malassez", respecting Malassez, yet at the species level rather than the variety level. At the point when it was resolved that the organic entities were something similar, the expression "Malassezia" was decided to have priority. In the mid-20th 100 years, it was renamed into two species:

1) Pityrosporum (Malassezia) ovale, which is lipid-reliant and tracked down just on people. P. ovale was subsequently separated into two species, P. ovale and P. orbiculare, yet current sources consider these terms to allude to a solitary types of organism, with M. furfur the favored name.
2) Pityrosporum (Malassezia) pachydermatis, which is lipophilic yet not lipid-subordinate. It is tracked down on the skin of most creatures.

This species which is grown in great extend with the help of flora. it is a condition worsen great with the climatic change as the severity of dandruff increase in winter season this extremities can go far to form flakes through out scalp of victim, resulting in spreading to the other parts of body likely to be in eyebrow beard and pubic areas. This malessezia with unusual number of corneocyte to be coated by the yeast upon stimulation of critical colonization of corneocyte by yeast the release of pro inflammatory mediator is increased.

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This is result of micro inflammation sub clinically present in dandruff. This adhesion of Malassezia spp. to the scalp on the over irritation result in alopecia on some extent.[47]

Fig.1 A microscopic image of human dandruff

II. DANDRUFF AND HAIR

Dandruff problem ranges from discrete to severe among subjects for instances, some african seen to have particularly abundant dandruff. The terminal hair results in entrapment of dandruff in the scalp. This dandruff found to be very less in the shaved or a blade person because no certain condition are maintained for its growth.[47]

It is most commonly seen by the expert that dandruff adhere to hair.

Certain observations are made to see specific product used to find dandruff may limit the progression of androgenic alopecia.[47]

III. CYCLE OF DANDRUFF

Dandruff skin is a cluster of corneocyte which mixes with stratum corneum. The fungus named Malassezia furfur it get its nutrition straight from the dead cell of scalp which indeed consist of lot of fat in it. This fungus excretion is acidic in nature and because of it the skin turn out rate increases.[47]

In mild cases it pop out as in the form of flakes and in severe condition it forms layers on the scalp skin because of layers the skin become more in acidic pH results in the scalp itching, (resulting in the formation of wound because of itching) and on that again fungus develop and the cycle continuous.[47]

Herbal formulation can be very helpful in The breakdown of the cycle which worsen the condition.

IV. HERBAL TREATMENT FOR DANDRUFF

There are various cosmetics preparation available in the market which are greatly effective against dandruff, like Shampoo (Wet shampoo, Dry shampoo), Conditioner, Serum, Hair mask, Hair Oil, Hair Cream, Gel, Lotions but shampoo is convenient one and have high antidandruff activity.

Shampoo may be described as a Cosmetic preparation for the washing of hair and scalp packed in a form convenient for use. Its primary function is cleaning of hair and providing sufficient nutrient.[48]

The area in the Scalp like sebum, Scalp debris and the residue of hair grooming is effected the most by shampoo. But on the addition of certain anti-dandruff agent can results in the cleansing of dandruff.[48]

V. THERE ARE SOME HERBS WHICH SHOWS GREAT ANTI-FUNGAL ACTIVITY

1) Tea Tree Oil

Tea tree known as *Melaleuca alternifolia*, It is essentially a types of tree or tall bush in the myrtle family, Myrtaceae.

Tea tree oil contains terpenoids, which is answerable for disinfectant and antifungal action. The compound terpinen-4-old is the most plentiful and liable for antimicrobial activity.[31]

Tea tree oil has been utilized to treat sicknesses like skin inflammation and psoriasis. It is additionally demonstrated to have strong antimicrobial and calming properties, which might assist with reducing side effects of dandruff. [1]
Tea tree oil is viable at battling the particular kind of organism that can cause both seborrheic dermatitis and dandruff.[2]
Moreover, tea tree oil might cause disturbance in those with delicate skin. In this manner, it's ideal to weaken it by adding a couple of drops to a transporter oil, for example, coconut oil prior to applying it straightforwardly to your skin.

Fig.2 Tea tree oil

2) Coconut Oil

Coconut oil removes from dried strong aspect of endosperm of coconut, *Cocos nucifera L.*, having a place with family Palmae.
Coconut oil contains Caprylic corrosive, capric corrosive, and lauric corrosive which shows antifungal action, yet caprylic corrosive is best than other.[32]
Its have various medical advantages, coconut oil is likewise utilized as a characteristic solution for dandruff.
It might work by further developing skin hydration and forestalling dryness, which can demolish dandruff.
As per some exploration, coconut oil might be pretty much as viable as mineral oil in further developing skin hydration when applied as a moisturizer.[3]
The applying coconut oil to the skin decreased side effects of atopic dermatitis a kind of skin inflammation described by tingling and inflammation.[4]

Fig.3 Coconut oil

3) Aloe Vera

Aloe vera also called as *Aloe barbadensis miller*. It belongs to Asphodelaceae (Liliaceae) family, and is a shrubby or arborescent, succulent, xerophytic, perennial, pea- green color plant.

Aloe vera contains Aloin and aloe-emodin which responsible for anti-fungal activity.[33]

Aloe vera is a succulent that's often added to skin ointments, cosmetics, and lotions.

When applied to the skin, it may help treat skin conditions such as burns, psoriasis, and cold sores. [5]

The antibacterial and antifungal properties of aloe vera may also protect against dandruff.[6] [12] It provides the Condition and moisturizing effect to hair.[19]

The topical use of aloe also may help people with herpes simplex, lichen planus, or psoriasis. [5] Similarly topical application of aloe gel may speed burn healing. There also is evidence that treatment with aloe vera may reduce pain from burns.[5]

It is an antifungal and antibacterial properties of Aloe vera may prevent dandruff. It will restore the PH of scalp and increases the hair growth.[11]

Fig.4 Aloe vera

4) Shikakai

Shikakai known as Acacia concinna Linn ,family -Leguminosae It is a Restorative plant that fills in tropical rainforests of southern Asia.

Shikakai contains saponins which responsible for anti-fungal activity.[34]

Shikakai which signifies "organic product for hair" is a piece of the customary Indian Ayurvedic medication.It is an herb especially used for controlling hair fall and dandruff.[7][12] [19] also used for washing hair, for promoting hair growth, as an expectorant, emetic, and purgative [7]

Shikakai can be utilized alone or in blend with reetha and amla as a cleanser to assist with overseeing hair fall and forestall dandruff because of its purging and antifungal properties. It provides shine to the hair as well as prevents its greying.[8] [12]

Fig.5 Shikakai

5) Amla (Indian Gooseberry)

Amla also called as *Emblica* ,Indian goose berry, It consists of dried,fresh fruits of the plant Emblica officinalis Gaerth ,family Euphorbiaceae.

Amla contains gallic acid which responsible for anti-inflammatory,anti-fungal and anti-bacterial activity. It also contains methanolic fruit extract and ethanolic fruit extract which shows anti-inflammatory and anti-microbial properties respectively.[35]

Amla natural product is generally utilized in the Indian arrangement of medication as diuretic, purgative, liver tonic, refrigerant, stomachic, supportive, against pyretic, hair tonic, ulcer preventive and furthermore valuable for normal cold, fever; as alone or in mix with other plants[9]

The phyto-nutrient, vitamins and minerals present in amla help in increasing the scalp circulation and stimulating healthy growth. It can nourish, strenghthen and add volume to hairs. It may also improve pigmentation, help in discoloration making the hair long and luscious.[9] [10][14]

Amla protects cells against free radical damage and provides antioxidant protection Amla is used to treat skin disorders, and premature aging.[9] [10]

The vitamin C present in amla produce collagen protein,collagens replace the dead cells of hair follicales with new hair cells.

It has anti-inflammatory,anti-bacterial properties can stop dandruff and iching.[28]

Amla oil effective for roots of hair to improves hair growth and color.[13] [15][19]

Amla contains tannin contents such as tannic acid, ellagic acid, gallic acid, iron and antioxidant material that freezes free radical damage to hair follicles, caused by dandruff.[13][16]

Fig.6 Amla(indian gooseberry)

6) Bhringraj

It is *Eclipta alba,* commonly called as , Gunta kalagaraku/ Gunta galagaraku, Karisalankanni, and bhringraj and it belongs to family Asteraceae.

The aerial part of E. alba contains Ethanol and ethyl acetate which showed the most antimicrobial activity. Bhringraj contains flavonoids which shows anti-inflammatory activity.[36]

It also known as the king of Herbs.[36]

It help in increasing the scalp circulation and stimulating healthy hair growth.[13][17]

Its antimicrobial and antifungal properties diminish dandruff and wipe out skin irritations on the scalp.[17]

Fig.7 Bhringraj

7) Reetha

Reetha knowns as *Sapindus mukorossi,* Indian soapberry, washnut, and belongs to family Sapindaceae.
Reetha also called as Soapnut.
Reetha contains saponins which responsible for anti-fungal activity.[37]
Reetha have cooling effects and It acts like foaming agent ,results used as cleaner for washing hair.[13][19]
It prevent dryness of scalp and retain the softness of the skin. The mixture of reetha and chickpea when applied on the skin gives gentler effects on the skin [18]
It helps to control hair fall by removing dandruff from the scalp.[13]

Fig.8 Reetha

8) Neem

Neem known as *Azadirachta indica,* nimtree or Indian lilac, belongs to family Meliaceae.
Neem as a universal healer or a cure for all disease and ailments.
Quercetin and ß-sitosterol, are polyphenolic flavonoids purified from neem fresh leaves which responsible for antibacterial and antifungal properties and nimonol also shows anti-fungal activity.[38]
Its different components like leaves, seeds and barks are utilized for many medicinal and beauty remedies for troubled skin.[12]
Its antifungal properties make it a dandruff reliever as it helps to reduce inflammation, irritation and itchiness on the scalp.[12][13]

Fig.9 Neem

9) Tulsi

Tulsi commonly known *Ocimum sanctum L.* and belongs to family Lamiaceae.
Eugenol, Urosolic acid, Carvacrol, Linalool are constituents in the tulsi which mainly responsible for anti-microbial ,anti-fungal and anti-inflammatory activity.[39]
It helps maintain moisture on scalp and reduce itchiness and dryness.It has antibacterial and anti-fungal properties which active against fungus that causes dandruff.[20]

Fig.10 Tulsi

10) Ginger

Ginger consists of the dried rhizomes of the *Zingiber officinale Roscoe*, belonging to family Zingiberaceae.

Ginger contains monoterpenoids, phenolic compounds and its derivatives,, sesquiterpenoids, aldehydes, ketones, alcohols, esters, which shows antimicrobial activity.[40]

Ginger contains various minerals and essential oil that make hairs well condition and moisturise which making hair more manageable, softer and shinier [13].

It relieves scalp itchiness, dryness and dandruff. It have natural anti-inflammatory and antiseptic properties which eliminating the bacteria that causes dandruff.[23][11]

It balances the PH of the scalp that ultimately helps in hair growth.[11]

Fig.11 Ginger

11) Brahmi

Brahmi is also known as *Bacopa monnieri* , and belong to the family of Plantaginaceae.

Brahmi oil is rich in nutrients like vitamin C, saponins, flavonoids calcium, zinc,, etc.[24] These nutrients strengthen the roots of your hair, boost hair growth reduce hair fall.[19]

Brahmi contains ethanolic, diethyl ether, and ethyl acetate which exhibits antibacterial and antifungal activity.[43]

Brahmi oil also contains alkaloids that increase the amount of protein in your hair follicles, thus making them strong and preventing hair fall.[24]

Dandruff is mainly caused by a flaky or overly oily scalp. When brahmi oil apply on the scalp, it balances the sebum production . Brahmi helps to cleanses the scalp by removing dandruff and excess oil. [24]

The antioxidant components in brahmi provides soothing ,cooling ,calming effect to scalp and nourishing the hair.[24]

Fig.12 Brahmi

12) Hibiscus

Hibiscus species of herbs, shrubs, and trees in the mallow family (Malvaceae)
Hibiscus contains Nonanoic Acid which active against fungal infection .[44]
Hibiscus carries amino acids, Vitamin A, C and alpha hydroxyl acids along with other nutrients that are highly beneficial for hair and scalp.[13]
They keep scalp healthy and minimize the chances of dandruff from hair [25]
Ginger make hairs well condition and moisturise which making hair more manageable, softer and shinier.[11]
The flowers and leaves contain mucilage and plant proteins that helps in treatment of anti dandruff and hair loss.[11]

Fig.13 Hibiscus

13) Fenugreek

Fenugreek also known as *Trigonella foenum-graecum,* in the family Fabaceae.
Fenugreek seeds are rich in protein which helps in hair loss, hair thinning, poorly growing hair.[26]
Fenugreek contains steroidal sapogenins, methanol, petroleum ether and ethyl acetate which are responsible antifungal activity.[45]
It also containing hair active B-vitamins, antioxidants which Conditioning and nourishment of hair.[19][26]
Fenugreek dynamic against malassezia spp. commensal yeast that causes dandruff and seborrheic dermatitis.[27]

Fig.14 Fenugreek

14) Henna

Henna called as *Lawsonia inermis*, and belong to family Lythraceae.
Henna contains gallic acid, coumarins, naphthalene derivates, flavonoids, sterols, triterpenoids, tannins, saponins, glycosides, and xanthones which shows anti-microbial activity.[41]
Henna keep the scalp moisturise and conditioner which help in growth of hair. It relieves scalp and hair dryness.[19]
It aids in removal of excess oils and dandruff from scalp and restore the normal sebaceous gland activity.[29]

Fig.15 Henna

15) Curry leaves

The curry tree known as *Murraya koenigii or Bergera koenigii,* from the family Rutaceae.

Curry leaves are good for fighting against hair-related problems like greying of hairs, dandruff and hair fall.[30]

The antifungal activity of the leaves of curry is due to the presence of phytochemical constituents likes alkaloids, terpenoids, flavonoids, phenolics, tannins, and saponins. Similarly bioactive compounds like girinimbine, murrayanine, marmesin-1′-O-beta-D'galactopyranoside, mahanine, murrayacine, mukoeic acid, murrayazolinine, girinimbilol, pyrafoline-D, and murrafoline-I are present in stem bark. Girinimbine, murrayanine, and marmesin-1′-O-beta-D'galactopyranoside also have great anti-fungal activity.[46]

Its antifungal properties help in reducing dandruff and itchiness and make clean and healthy hair. Curry leaves moisturize the scalp, promote hair growth.[11]

Curry leaves are rich in cell reinforcements that saturate the scalp while disposing the dead hair follicle, helps in preventing hair fall, premature hair graying, and dandruff.[11]

Fig.16 Curry leaves

VI. ANTI-DANDRUFF ACTIVITY : CULTURE MEDIA METHOD

Culture media method is one of the simplest and affordable way to determine the Anti-Dandruff activity, in Vitro. The requirements for this method are listed here:

1) *Culture:* Pure culture of Malassezia furfur (MTCC-1765) can be obtained from Institute of Microbial technology, Chandigarh, India.
2) *Media:* common media used for the study is Sabouraud-Dextrose Agar (SDA) medium and Dutta and Dikshit Modified culture medium (17).

VII. CONCLUSION

Recurrence of dandruff is the major drawback of available treatment for antidandruff i.e antifungal agent and keratolytic agents in formulation especially in shampoo. This problem can be overcome by development of herbal formulation with the use of traditional knowledge of herbs and with additional advantages like its safety as compared to synthetic actives, and its conditioning and smoothening property.

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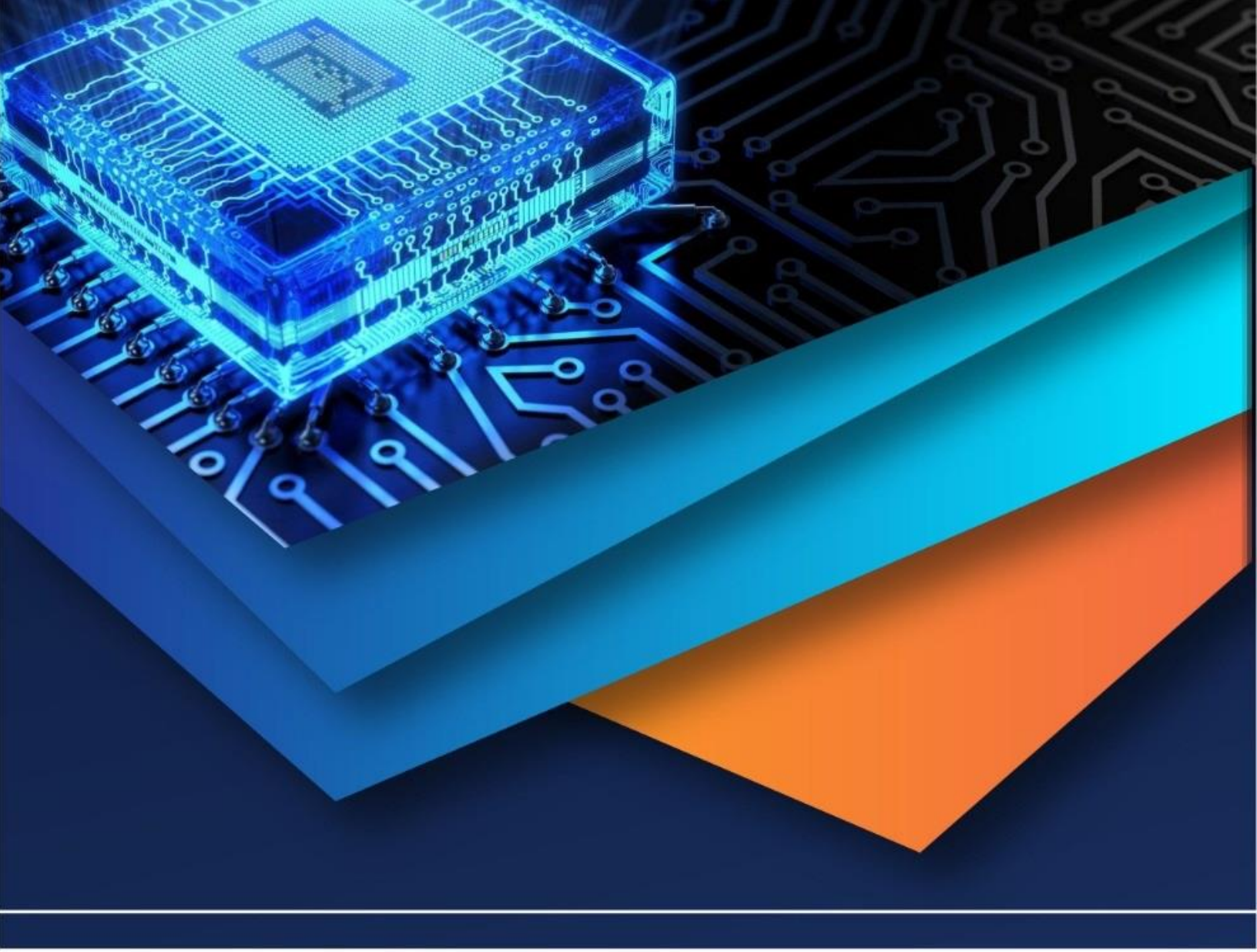

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