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PHARMACOLOGICAL ACTIVITY OF TINEA CAPITIS ON MEDICINAL PLANTS

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ABSTRACT

Tinea capitis is a common dermatophyte infection of the scalp. It is caused primarily by the dermatophyte species *Microsporum* and *Trichophyton*. The fungi can penetrate the hair follicle‟s outer root sheath and ultimate may invade the hair shaft. Tinea capitis is generally observed in children over the age of 6 years and before puberty. Clinical presentations are seborrheic-like scale, inflammatory tinea capitis with kerion and tiny pustules in the scalp. The clinical diagnosis should be confirmed by mycological examination .Treatment of tinea capitis requires an oral anti-fungal agent.

INTRODUCTION

Tinea capitis is a dermatophyte infection of the scalp hair follicles and interveining skin caused primarily by anthropophilic and zoophilic organisms from the genera Trichophyton and Microsproum. Despite an overall increase in the frequency of anthropophlilic scalp infections in Europe, Microsporum canis remains the most common organism, with the highest incidences in the Mediterranean and neighboring countries.[2] Tinea capitis, often known as ringworm (or) herps tonsurans infection, is a fungal illness affecting the scalp hair. The infection is frequently contracted from another human (or) animal. Tinea capitis is classified clinically as either inflammatory or non-inflammatory. Its clinical manifestations range from modest scaling and minimal hair loss to massive inflammatory and pustular plaques with widespread alopecia. It's caused by an over growth of a type of yeast(fungus) that naturally found on our skin. The treatment for tinea capitis is systemic anti-fungal medications. The medication should be taken by mouth for 1-3 months, as the oral administration shows greater effect than topical and parental route. Wood's light examination was of value in diagnosing tinea capitis.[1] The plants which shows tinea capitis activity and helps in the treatment of this infection are Cleome gyandra, Neem leaves, Surinam cherry, Aloevera gel, Apple cider, Onion, Tulasi, Azadirachta indica, Thyme, Cinnamon, Oregano, Clove, Mint. Oral anti-fungal therapy (terbinafine, griseofulvin, itraconazole and fluconazole) is considered the gold standard for tinea capitis.

TINEA CAPITIS ACTIVITY OF VARIOUS MEDICINAL PLANTS

1. CLEOME GYNANDRA

The scientific name is *Cleome heterotricha burch*, common name is wild spider flower. Its belongs to the family of Capparaceae. The chemical constitution of

cleome heterotricha Alpha-tocopherol, Beta-tocopherol and y-tocopherol, Ascorbic acid, Alpha-carotene, Beta-carotene, Lutein, Violaxanthin and Beta-cryptoxanthin. The Pharmacological activity of cleome gynandra are anti-inflammatory, free radical, scavenging, anti-cancerous, immunomodulator and anti-diabetic agents.[3]

2. APPLE CIDER VINEGAR

The scientific name is Malus pumila Mill. The chemical components of Malus pumila mill include acetic acid and polyphenolic compounds. Succinic, ascorbic, formic, citric, and oxalic acids are other organic acid compounds. Apple cider vinegar has excellent antioxidant, anti-inflammatory, hepatoprotective, and anti-cancer properties.[4]

3. ONION

The scientific name is Allium cepa.It belongs to the Amaryllidaceae family. Allium cepa's chemical ingredients include allicin, alliinase, quercetin, alliin, isorhamnetin, quercetin 3,4'-diglucoside, allyl methyl sulfide, syn-propanethial-S-oxide, iso allilin, propyl disulfide, and sulfenic acid. Onions have anti-cancer, anti-diabetic, and anti-microbial, anti-platelet characteristics and their impact on the urogenital, neurological, gastrointestinal, circulatory, and bone systems, including its anti-osteoporosis capabilities.[5]

4. TULASI

The scientific name is Ocimum tenuiflorum. Its members are in the Lamiaceae family. Estragole, Eugenol, Rosmarinicacid, Germacrene D, Germacrene, Sabinene, Borne camphene, CoPaene, Methyl Eugenol, and Germacrene are the chemical components of Ocium tenuiflorum. carvarrol, farnesene, ursolic acid, geanolic acid, beta-bisabolen, and beta-caryophyllene oxide. Tulasi has anti-microbial (antibacterial, antiviral, anti-fungal, anti-protozoal, anti-malarial, and anti-helmintic) properties. It also has anti-oxidant, anti-diarrhea, anti-cataract, anti-inflammatory, chemo preventive, and radioprotective properties.[6]

5. SURINAM CHERRY

The scientific name is Eugenia uniflora. It is a member of the Myrtaceae family. Eugenia uniflora chemicals include β-caryophyllene, Curzerene, Ocymene, D-limonene, Alpa and Beta-pinene, and Beta and y-elemene. Surinam cherry pharmacological action is commonly used to treat diabetes, hypertension, and digestive issues in addition to antibacterial medicines.[7]

6. ALOEVERA GEL

The scientific name is Aloe barbadensis miller. It is a member of the Liliaceae family. Aloe barbadensis miller has the following chemical components: flavonoids, coumarins, phenolylpropanoids, naphthalene, analogs, lipids, vitamins, and phytosterole. The Alovera gel has pharmacological properties that include immunoregulatory, anti-inflammatory and antioxidant properties.[8][9]

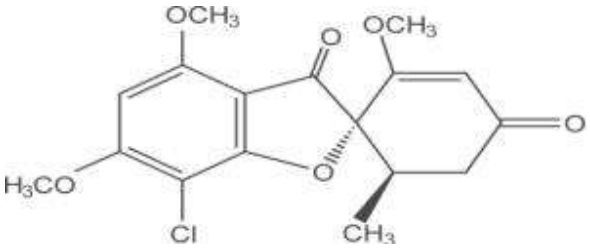
7. NEEM

Azadirachta indica is the plant's scientific name. It is a member of the Meliaceae family. Nimbin, Nimbanene, Himbolide, Ascorbic acid, Nimbandiol, Aminoacid, Hexalosanol, 7-desacetal-7-benzoylazadiradione, and Nimbiol are the chemical constituents of Azadirachta indica. The pharmacological properties of Neem include anti-microbial, anti-hiv, anti-fugal, anthemintic, anti-parasitic, anti-cancer, anti-diarrheal, anti-pyretic, and immunological modulation properties.[9][10]

DRUGS

GRISEOFULVIN

It appears that griseofulvin works by preventing the assembly of fungal microtubules, which is necessary for mitosis during cell division and, ultimately, prevents cell replication. Despite having just fungistatic properties, it works wonders to treat infections of the tinea capitis caused by against T tonsurans, and nearly as successful when used against M audouinii and M canis. The fact that this medication is fungistatic only and needs to be taken for at least six weeks is one of its downsides.[1]



GRISEOFULVIN

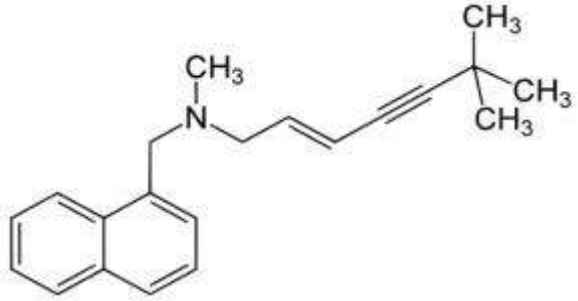
IUPAC NAME : (2S,6'R)-7-chloro-2',4,6-trimethoxy-6'-methyl-3H,4'H-spiro [1-benzofuran-2,1'-cyclohex[2]ene]-3,4'-dione

Generic: Griseofulvin

- **Form:** Oral tablet (ultramicrosize)
- **Strengths:** 125 mg, 250 mg
- **Form:** Oral tablet (microsize)
- **Strengths:** 250 mg, 500 mg[1]
- **Brand:** Gris-PEG
- **Form:** Oral tablet (ultramicrosize)
- **Strengths:** 125 mg, 250 mg

TERBINAFINE

When treating pediatric tinea capitis, terbinafine is a safe, well-tolerated antifungal medication. Lower cure rates were the outcome of the treatment's shorter duration. It's crucial to remember, though, that according on how severe the illness is, a one-week-only treatment can potentially beneficial. For tinea capitis, it is the first line of treatment. Terbinafine comes in a 250 mg tablet that is meant to be swallowed. For dermatophyte infections, one tablet taken orally once a day is the standard dosage.[12]



TERBINAFINE

IUPAC NAME : [(2E)-6,6-dimethylhept-2-en-4-yn-1-yl](methyl)(naphthalen-1-ylmethyl)amine

DISCUSSION

Tinea capitis is treated with the antifungal properties of medicinal plants. Plant extract safety studies were not conducted as required for clinical trials, however in 1996, the WHO guidelines declared that "If a substance has been traditionally used without documented safety. Therefore, no particular limiting laboratory measure should be implemented unless fresh data necessitates a reevaluation of the risks and benefits. In particular, the "Cleome gynandra" satiated this requirement, as it is a plant that has historically been utilized as a vegetable food and a medicinal herb. Because of their favorable pharmacokinetic and pharmacodynamic characteristics, itraconazole, fluconazole, and terbinafine are all great options for treating tinea capitis.[3] The strong antibacterial activity of azadirachta indica leaves supports the high potential of bioactive chemicals and helps to justify the plant's usage in basic healthcare.[9] Among the ingredients in Alovera gel are phenol, saponin, anthraquinones are categorized as antifungal, antiviral and antibacterial substances. Because saprophytic fungi are present on skin and hair, there is a chance that under some situations, they may invade these tissues and result in primary or secondary infection.[8] Paecilomyces variotii and Aspergillus niger were recovered with great frequency by Onion activity.[5] The three vitamins that can help with tinea capitis are vitamin B2 (riboflavin), vitamin B3 (pantothenic acid), and vitamin B9 (folate).

CONCLUSION

Since the time of the Vedas, plants have been utilized as a source of medicine. Among the various nursing systems that professed to be able to treat every serious illness on the globe was Ayurvedic medicine. Plant remedies were found to be more effective than manufactured pharmaceutical sources when due to their strong therapeutic properties and extensive variety of applications. Cleome gyandra, Neem leaves, Surinam cherry, Aloevera gel, Apple cinder, Onion, Tulsi, Azadirachta indica, Thyme, Cinnamon, Oregano, Clove, and Mint are the medicinal

herbs that have been chosen. Terbinafine, griseofulvin, itraconazole, and fluconazole are the medications. These herbal plants have demonstrated increased antifungal activity in the treatment of tinea capitis in recent years. The study looked at a potential source of beneficial natural medicine made from plants.

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