# Occurrence of keratinophilic fungi from Holkar Science College Park soil of Indore, Madhya Pradesh.

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**Abstract-**
Recently, human exposure to potentially pathogenic fungi is threatening the health of people. These fungi plays vital task in decomposing keratinous debris of man and animals in nature. In order to study the occurrence of keratinophilic fungi present in soil of college Indore city, thirty soil samples were collected randomly from Parks soil of Indore (Madhya Pradesh). Screened for presence of keratinophilic fungi using hair baiting technique for isolation. The isolated keratinophilic fungi were classified in to 07 species belonging to 04 genera. These soil samples are rich in pathogenic keratinophilic fungi including dermatophytes. The keratinophilic fungi isolates were *Microsporum nanum, Trychophyton rubrum, Trychophyton tonsurans, Trychophyton terrestre, Chrysosporium keratinophilum, Chrysosporium sp., and Epidermophyton flococcum.*

**Key words: -** ***Keratinophilic fungi, Soil samples, Hair baiting technique.***

## Introduction

Keratinophilic fungi are important ecologically and play a significant role in natural degradation of keratinous substrates. Soils that are rich in Keratinous materials are most conducive for the growth and occurrence of Keratinophilic fungi. These are a group of fungi that colonize various Keratinous substrates and degrade them. Their distribution is variable with the environment and depends on different factors, such as human and or animal presence. Keratinous substances which are important natural material, occurring in nature mainly in the form of hairs, wools, feathers, horns, hooves, nails, skin and other cornified appendages constitutes natural baits for these fungi(Khanam and Jain 2002). Keratinophilic fungi include a variety of filamentous fungi, mainly comprising hyphomycetes and several other taxonomic groups. Hyphomycetes include dermatophytes and a great variety of non dermatophytic filamentous fungi (Sharma and Mukesh 2010). Keratinolytic fungi are a group of microorganisms that are able to decompose Keratin remains in environment and are pathogenic to humans and animals. Kertainophilic fungi are divided into three categories anthropophilic when human beings are the natural hosts. Zoophilic when a variety of animals act as natural hosts. Geophilic, when the soil is the natural habitat. Soil serves as a natural reservoir for both pathogenic and saprophytic fungi. Some keratinophilic fungi are called dermatophytes because of their capacity to parasitize keratinic tissues in human and animals.

## Material and methods-

Collection of soil samples and baits: 30 soil samples were collected randomly (4 sites) from holkar science college park from Indore (Madhya Pradesh). Before collection of soil samples, superficial debris and other vegetative materials were removed from the soil surface. Loosened soil (approximately 500g) were taken from the surface layer of each site to a depth of 2-5cm. Soils were collected in sterile plastic bags and sealed on the spot.

Defatting of baits was done by soaking them for 24 hrs in diethyl ether and later rinsing them 3- 4 times distilled water followed by air drying.

Isolation identification of keratinophilic fungi: Keratinophilic fungi were isolated by the hair baiting technique of Vanbreuseghem (1952) human hair as keratin bait. The soil samples and moistened with sterile distilled water were baited by burying sterile keratinous bait in the soil. These dishes were incubated at room temperature for 3- 4 weeks. After observing the mycelial growth on the baits, isolates were cultured on Sabouraud's Dextrose Agar (SDA) medium supplemented with streptomycin or chloramphenicol (30 mg/l).

Identification of keratinophilic fungi: Isolated fungi were stained with lectophenol and cotton blue and observed it under the microscope, literature and other sources.

## Results & Discussion

In this study, total of forty samples were collected from soil in college park soil of Indore region of M.P., 07 species and 04 genera of Keratinophilic fungi were isolated from college garden soil with keratin substrates such as human hairs. In the present study most of the isolated Keratinophilic fungi - , *Microsporum nanum, Trychophyton rubrum, Trychophyton tonsurans, Trychophyton terrestre, Chrysosporium keratinophilum, Chrysosporium sp., and Epidermophyton flococcum.*

In the present investigation, the fungal strains *Microsporum nanum* and *Trychophyton* were frequently isolated Keratinophilic fungi and dermatophytes were also previously reported from Indian soils. The present study clearly indicates the diverse existence of Keratinophilic fungi in soils of Indore. Kertinophilic fungi are important ecologically and play major role in bioremediation in natural environment. Jangid and Begum (2018) al so reported *Aspergillus niger, Chrysosporium sp*.

In these studies the fungal strain *Microsporum* and *Trychophyton sp*. were frequently isolated keratinophilic fungi and dermatophytes were al so previously reported from soil of India (Deshmukh 2010 and Shadzi 2002).

Occurrence of *Microsporum sp.* In different types of soil is important for pathogenic potential of fungus and was confirmed in several studies in different countries. *Microsporum audouinii* was showed to cause systemic infection in a person with a chronic skin disease (Hedayati and Shokohi, 2005).

In previous studies *Trychophyton rubrum* reported best producer of keratinase (Roilides *et al* 2014). *T. rubrum* had been recognized as a strong producer of extracellular keratinase in medium including procine nail as the source of nitrogen and carbon. *T. rubrum* and *T. tonsuranse* reported the most frequent isolate from Public Park in Isfahan (Fillipello 2000).

Second most common species isolated in our study were *Chrysosporium* and *Penicillium sp.* was reported from comb lesion in two different breeds of chicken in india.(Sharma and Rajak 2003).

## Conclusion

It is concluded from the present study that Keratinophilic fungi isolated from soil of Holkar Science college Park of Indore (M.P.).These are the most frequent fungal infections worldwide. Finally, this study reveals that the soil is rich in dermatophytes and related fungi responsible for dermatophytosis or ringworm disease.

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