

## Changing Trends in the Fungal Isolates from Clinical Specimens of Suspected Superficial Mycosis

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### Abstract

**Introduction:** The local patterns of fungal isolates from clinical specimens may change with time and geographical area and it is important to be familiar with recent local trends in order to improve diagnosis. **Objective:** The local patterns of fungal isolates from clinical specimens of suspected superficial mycosis was studied in a tertiary care centre in Orissa between 2009 - 2011. **Material and Methods:** Mycological examinations of 311 materials sampled from various sites in patients with suspected superficial mycosis was done by KOH wet mount and culture. **Results:** A total of 311 specimens were sent for mycological study. Out of 217 specimens of suspected superficial mycosis, Trichophyton (68.42%) was the most frequently isolated genus, with *T. rubrum* (62.82%) as the most common species, followed by the *T. mentagrophytes* (29.48%). *T. schoenlenii* was responsible for 18.75% of *T. pedis* and 38.4% of *T. capitis* cases. *T. tonsurans* was responsible for 50% of *T. barbae* and 23.8% *T. cruris* cases. Out of the other 94 specimens, *Aspergillus* (35.1%) was the most frequently isolated genus, with *A. fumigates* (57.57%) as the most common species; followed by *Candida* (17.02%) in which *C. tropicalis* (31.25%) was the most commonly isolated species followed by *C. albicans* (25%). **Conclusions:** An evident change in the spectrum of fungal isolates causing superficial mycosis has been observed with *T. schoenlenii* and *T. tonsurans* emerging as a causative agent of *T. pedis*, *T. capitis* and *T. barbae*

and *T. cruris* respectively. There is a decrease in the relative frequency of *C. albicans* and increase in *Candida tropicalis* causing superficial fungal infections.

### Introduction

Superficial mycosis refers to the infection of skin and its appendages caused by fungi. This group includes dermatophytosis, pityriasis versicolor and candidiasis<sup>1</sup>. These fungi have the capability to produce keratinase, which allows them to metabolize and live on human keratin like skin, nail and hair<sup>2</sup>. Dermatophyte infections are one of the earliest known fungal infections of mankind and are very common throughout the world<sup>3</sup>. Although dermatophytosis does not produce mortality, it does cause morbidity and poses a major public health problem, especially in tropical countries like India due to the hot and humid climate<sup>3</sup>. Infection of skin or nail can also be caused by non-dermatophytic fungi and yeast-like fungi. These can also be cutaneous manifestation of systematic mycosis. Over the last decades, an increasing number of non-dermatophyte filamentous fungi have been recognized as agents of skin and nail infections in humans, producing lesions clinically similar to those caused by dermatophytes<sup>4</sup>.

Though several reports on dermatophytosis are available from different parts of the country, The local patterns of fungal isolates from clinical specimens may change with time and geographical area and it is important to be familiar with recent local trends in order to improve diagnosis.

The present study was undertaken with a view to find out the local patterns of fungal isolates from clinical specimens of suspected superficial mycosis in a tertiary care centre in Orissa between 2009 - 2011.

### Material and Methods

Mycological examinations of 217 materials sampled from various sites in patients suspected superficial mycosis was done by KOH wet mount and culture. All specimens were examined by 10% KOH mount for screening of fungal elements and inoculated in duplicate on Sabouraud's Dextrose Agar (SDA) with 0.05 mg/ml chloramphenicol (with or without 0.5 mg/ml cycloheximide) and incubated at 25°C in a BOD incubator for four weeks. Identification of dermatophyte spp was done according to standard procedures by observing the colony morphology on SDA and dermatophyte isolation agar and performing microscopic

examination for macro-conidia and Micro-conidia, Hair Perforation Test and Urease Test. Identification of non dermatophyte spp and yeast spp. was done by observing the colony morphology, microscopic features, germ tube test and carbohydrate assimilation tests etc<sup>5</sup>.

### Results

A total of 311 specimens were sent for mycological study out of which 217 specimens were of suspected superficial mycosis amongst which 114 (52.53%) specimens were positive for dermatophyte isolates. *Trichophyton* (108/ 114 i.e. 94.73%) was the most frequently isolated genus in which *T. rubrum* ( 55/108 i.e. 50.92%) was the most common species, followed by the *T. mentagrophytes* ( 30/108 i.e. 27.77%). *T. schoenlenii* was responsible for 3(18.75 %) of *T. pedis* and 7(36.84%) of *T. capitis* cases. *T. tonsurans* was responsible for 4(i.e. 50%) of *T. barbae* and 4(i.e. 20%) of *T. cruris* cases. 5(i.e. 4.38%)specimens were positive for nondermatophyte isolates. Amongst the nondermatophyte isolates, *Aspergillus*( 3 i.e. 60%) was the most frequently isolated genus amongst which *A. fumigates* ( 2 i.e. 66.66% )was the most common species. 4(i.e. 3.50%) specimens were positive for yeast isolates amongst which *Candida*( 3 i.e.

**Table 1**

Total Specimen	Suspected Fungal Infection	KOH Positive	KOH Negative
311	217(69.77%)	164(75.57%)	53(24.42%)

**Table 2**

Total Culture Positive Specimen	Dermatophyte Spp.	Nondermatophyte Spp	Yeast Spp
114 /164(69.51%)	105(92.10%)	5(4.38%)	4(3.50%)

**Table 3**

Clinical Types of Dermatophytosis	Dermatophyte Species							
	E. Floccosum	T. Rubrum	T. Mentagrophyte	T. Scholenii	T. Tonsurans	M. Audaunii	M. Canis	Total
T. Corporis	-	16	8	1	2	1	1	29
T. Ungium	1	5	3	-	-	-	-	9
T. Pedis	1	7	5	3	-	-	-	16
T. Cruris	-	9	7	-	4	-	-	20
T. Capitis	-	6	4	7	-	2	-	19
T. Barbae	-	4	-	-	4	-	-	8
T. Fasci	-	5	1	1	-	-	-	7
T. Mannum	-	3	2	1	-	-	-	6
Total	2	55	30	13	10	3	1	114

2.6%) was the most frequently isolated spp. with *C. tropicalis* (2 i.e. 66.66%) as the most commonly isolated species followed by *C. albicans* (1 i.e. 33.33%).

### Discussion

Superficial mycosis refers to the infection of skin and its appendages caused by fungi. This group includes *dermatophytosis*, *pityriasis versicolor* and *candidiasis*.<sup>1</sup> Dermatophytes are a unique group of fungi that infect keratinous tissue and are able to invade hair, skin and nails of a living host. This closely related group of organisms can be categorized into one of three genera: *Trichophyton*, *Microsporum*, and *Epidermophyton*. Various studies show that *T. rubrum* remains the most prevalent dermatophyte pathogen, and increased incidence of this spp. is observed in onychomycosis, tinea corporis, tinea cruris, tinea manuum and tinea pedis.<sup>8</sup>

The common causative agents of **T. pedis** is *E. floccosum*, *T. mentagrophyte*, *T. rubrum*; **T. unguis** is *T. rubrum*, *T. mentagrophyte*, *E. floccosum*; **T. capitis** is *M. canis*, *M. audouinii*, *T. mentagrophyte* (ectothrix), *T. tonsurans* (endothrix), *T. verrucosum* (kerion), *T. schoenleinii* (favus); **T. barbae** is *T. violaceum*, *T. mentagrophyte*, *T. verrucosum*; **T. corporis** is *T. rubrum*, *T. mentagrophyte*, *T. tonsurans* and **T. cruris** is *E. floccosum*.<sup>8</sup>

In our study, out of 217 specimens of suspected tinea infection, *Trichophyton* (68.42%) was the most frequently isolated genus, with *T. rubrum* (62.82%) as the most common species, followed by the *T. mentagrophytes* (29.48%). Similar outcome has been shown in other studies also.<sup>7,8</sup>

Singal *et al.*, in their study of *T. capitis* cases from North India have reported a change in the spectrum of dermatophytes with most common isolate as *T. violaceum* (38%) followed by *M. audouinii*, *T. schoenleinii*, *T. tonsurans*, *M. gypseum*, *T. verrucosum* and *T. mentagrophytes*.<sup>6</sup>

But in our study *T. schoenleinii* was responsible for 3 (i.e. 18.75 %) of *T. pedis* and 7 (i.e. 36.84%) *T. capitis* cases. *T. tonsurans* was responsible for 4 (i.e. 50%) of *T. barbae* and 4 (i.e. 20%) *T. cruris* cases. These findings are not in accordance with the previous studies.<sup>6,7</sup>

Amongst the nondermatophyte isolates, *Aspergillus* (3 i.e. 60%) was the most frequently isolated genus amongst which *A. fumigatus* (2 i.e. 66.66%) was the most common

species. This can be explained by the fact that over the last decades, an increasing number of non – dermatophyte filamentous fungi have been recognized as agents of skin and nail infections in humans, producing lesions clinically similar to those caused by dermatophytes.<sup>4</sup>

Amongst candida spp. *C. tropicalis* (2 i.e. 66.66%) was the most commonly isolated species followed by *C. albicans* (1 i.e. 33.33%).

### Conclusions

An evident change in the spectrum of fungal isolates causing superficial mycosis has been observed with *T. schoenleinii* and *T. tonsurans* emerging as a causative agent of *T. pedis*, *T. capitis* and *T. barbae* and *T. cruris* respectively. There is a decrease in the relative frequency of *C. albicans* and increase in *Candida tropicalis* causing superficial fungal infections.

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