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## ***Trichophyton rubrum*: The Commonest Isolate from Dermatophytosis**

Sumit Kumar<sup>1\*</sup>, Shrikara Mallya P<sup>2</sup>, Shalini Shenoy M<sup>2</sup>

<sup>1</sup>Department of Microbiology, Teerthanker Mahaveer Medical College and Research Center, Moradabad, U.P

<sup>2</sup>Department of Microbiology, Kasturba Medical College, Mangalore, Karnataka.

### ABSTRACT

Dermatophytosis is a trivial disease but has lot of psychological effect and a costly disease in terms of treatment. Though various species of dermatophytes produce clinically characteristic lesions, but a single species may produce variety of lesions depending upon site of infection. The present study was undertaken with following aim and objectives. Isolation and identification of different etiological agents causing dermatophytosis. Correlation between the site of involvement and the causative agents. Frequency of occurrence of various dermatophytes. Isolation and identification was done by macroscopic, microscopic and biochemical tests. The present study for isolation and identification was done on 250 clinically diagnosed cases of dermatophytosis. Out of 250 cases of dermatophytosis, 138 cases (55.2%) were positive in direct microscopic examination (KOH) and total of 106 cases (42.4%) were positive in culture. 102cases (40.80%) were positive in direct examination (KOH) as well as culture. In the present study commonest isolate 69(65.09%) were *Trichophyton rubrum* from all clinical isolates. This study highlighted that *Tinea corporis* is the commonest clinical type. *T.rubrum* are the most common etiological agents and males are more frequently affected.

**Keywords:** Dermatophytosis, Dermatophytes, *Tinea*, *Trichophyton rubrum*

**\*Corresponding author**



## INTRODUCTION

Dermatophytosis is a colonization by a dermatophytic fungus of the keratinized tissues the nails, the hair and the stratum corneum of the skin [1]. Although problem especially in tropical countries like India due to hot and humid climate. No race in any geographical location is totally free from dermatophytes [2]. Nature of dermatophytosis may change with passage of time, living population, evolution of preventive measures and hygienic conditions in society [3]. Dermatophytosis produce a dermal inflammatory response with intense itching and also of cosmetic importance [4]. Though various species of dermatophytes produce clinically characteristic lesions, but a single species may produce variety of lesions depending upon site of infection [5].

The present study was done to determine the commonest isolate from dermatophytosis.

## MATERIAL AND METHODS

The study was done over a period of two years.

Clinically suspected 250 cases of dermatophytosis attending the skin and venereal diseases in the outpatient were studied. After history, clinical examination was done. The patient was made to sit in the good light and clinical examination of lesion was done. It includes number of lesions, types, presence of inflammatory margin, etc.

Aseptic technique was used to minimize contamination 70% alcohol for disinfection, sterile water for cleaning of painful areas. Black photographic paper was useful for collecting and better visualizing scrapings. From the scalp was epilated with sterile forceps. After disinfection with alcohol skin lesions was scraped with a scalpel to collect epidermal scales. Nails were disinfected with alcohol gauze squares. The most desirable material for culture in typical subungual onychomycosis was the waxy subungual debris, which contains the fungal elements [6]. 10% KOH solution was used for skin, hair and for nail scrapings required a stronger alkali solution 20% KOH .All preparations were examined under low power and confirmed under high power. Two sets of culture medium were used. Sabourauds dextrose agar (modified), Sabourauds dextrose agar with cycloheximide and chloramphenicol were incorporated to avoid contamination with saprophytic fungi and bacteria. The clinical material were inoculated into one each of the above two media. The inoculated agar slants were incubated in room temperature and at 37°C in incubator and observed daily for growth. If no growth was noticed by four weeks culture considered negative and discarded. A tease mount was made as soon as sufficient growth was evident on isolation media Slide culture technique, the fungus was subcultured on an agar block held between slide and coverslip. This enables the arrangement a mycelium and spore to be observed undisturbed at various stages of growth.

The ability to hydrolyze urea provides additional data that can be used to aid in the differentiation of *T.rubrum* (urease negative) from *T. mentagrophytes* typically urease positive

Unlike most dermatophytes, *M. audouinii* grows poorly on rice grains and produces a brownish discoloration of the rice.

In-vitro hair perforation test. *T. mentagrophytes* has the ability to penetrate the hair shaft but not *T. rubrum*.

## RESULTS

The present study for isolation and identification was done on 250 clinically diagnosed cases of dermatophytosis. Samples collected were 215 Skin scraping (86%), Nail clipping 24 (9.6%) Hair stubs 11(4.4%).

**Table 1: Results obtained in the direct examination and culture**

	KOH Positive (n%)	KOH negative (n%)	Total (n%)
Culture positive	102 (40.80%)	4 (1.6%)	106 (42.4%)
Culture negative	36(14.4%)	108 (43.2%)	144 (57.6%)
	138 (55.2%)	112 (44.8%)	250 (100%)

Out of total 250 clinical isolates 106 cases(42.4%) were culture positive.(Table-1) *Trichophyton rubrum* were the commonest isolates 69(65.09%) other isolates were *Trichophyton mentagrophytes* 19(17.92%), *Trichophyton violaceum* 4(3.78%), *Epidermophyton floccosum* 9 (8.49%), *Microsporium audouinii* 5(4.72%).(Table-2)

**Table 2: Incidence of various species of dermatophytes in clinical isolates**

Species	No. of isolates	Percentage
<i>Trichophyton rubrum</i>	69	65.09%
<i>Trichophyton mentagrophyte</i>	19	17.92%
<i>Trichophyton violaceum</i>	4	3.78%
<i>Epidermophyton floccosum</i>	9	8.49%
<i>Microsporium audouinii</i>	5	4.72%
	106	100%

In 55 isolates of *Tinea corporis* *Trichophyton rubrum* isolated in 34 cases (61.82%) were the commonest isolate. Other isolates were *T. metagrophyte* 12(21.82%), *Trichophyton violaceum* in 2(3.63%), *E. floccosum* 5(9.69%), *Micorsporium audouinii* 2(3.64%).

In 35 isolates of *Tinea cruris*, *T. rubrum* were in 26 cases (74.28%) *T. metagrophyte* 4(11.43%), *E. floccosum* 4(11.43%) *Microsporium audouinii*, 1(2.85%).

In 3 isolates of *T. unguium* 3 isolate (60%) were *T. rubrum*, 2 isolates (40%) were *T. mentagrophytes*.

In 5 isolates from *T.capitis*, *T.rubrum* was in 1 case (20%). *T.violaceum* 2 cases (40%), *Microsporum audouinii* 2 cases (40%).

*T. manuum* in 2 isolates, 1(50%) isolates was *T. rubrum*, *T.metagrophyte* 1(50%). In *T.facie*, *T. barbae* all isolates were *T.rubrum* (100%).(Table-3)

**Table 3: Dermatophytes in different clinical types**

	<i>Tinea corporis</i>	<i>Tinea cruris</i>	<i>Tinea unguium</i>	<i>Tinea pedis</i>	<i>Tinea capitis</i>	<i>Tinea manuum</i>	<i>Tinea facie</i>	<i>Tinea barbae</i>	Total
<i>Trichophyton rubrum</i>	34 (61.82%)	26 (74.88%)	3 (60%)	2 (100%)	1 (20%)	1 (50%)	2 (100%)	1 (100%)	69
<i>Trichophyton mentagrophyte</i>	12 (21.82%)	4 (11.43%)	2 (40%)			1 (50%)			19
<i>Trichophyton violaceum</i>	2 (3.63%)				2 (40%)				4
<i>Epidermophyton floccosum</i>	5 (9.69%)	4 (11.43%)							9
<i>Microsporum audouinii</i>	2 (3.64%)	1 (2.85%)			2 (40%)				5
Total	55	35	5	2	5	2	2		1

$\chi^2 = 44.227$ ,  $P = 0.0264$

## DISCUSSION

Among the various fungal infections of human beings dermatophytes is a most common infection of the world. [2] Studies on dermatophytosis in India have received increased attention in recent years because 1/5 the of the world’s population suffers from mycosis. [7]

The present study was done on 250 clinically diagnosed cases of dermatophytosis attending the outpatient department of Dermatology.

Samples collected were 215 Skin scraping (86%), Nail clipping 24 (9.6%) Hair stubs 11(4.4%)

In the present study commonest isolate 69 (65.09%) were *Trichophyton rubrum* from all clinical isolates. In *T.corporis* 34 isolates (61.82%), in *T. cruris* 26 isolates (74.28%). in *T. unguium* 3 isolates (60%) were *Trichophyton rubrum*. In *T.capitis* and *T. manuum* *T. faciei*, only *T. rubrum* was isolated.

Other studies also supported the present study

In the study done by Nita Patwardhan, Rasmika Dave commonest isolate was *T.rubrum* being (28.12%) in all clinical cases. It was prevalent in *T. corporis* and *T.cruis* [3].

In study done by Seema Bhaduria, Neetu Jain. *T.rubrum* was the main isolate in all clinical types 17/50 (34%) [7].

In the study done by G. Venkatesan, AJA Ranjit Singh et al. *T.rubrum* was the main causative agent in *T. corporis* (45.1%), *T. cruris* (22.6%), *T. pedis* (2.8%) onychomycosis 2(2.8%) [2].

In the present study 138 cases (55.2%) were positive in direct microscopic examination (KOH). 106 cases ( 42.4%) were culture positive. 108 cases(43.2%) showed neither culture positive nor KOH positive. The present study was supported by other studies.

Bindu V. et al observed in their study that in direct microscopy positivity was 64% cases and culture positivity was 45.3% cases [10].

S, Singh, P.M. Beena also reported 60.38% cases positive by microscopy and 44.6% cases were culture positive. 53.38% cases did not showed evidence of fungus either on direct microscopy or on culture [11].

SS Sen, ES Rasul reported that 4.9% cases were positive for fungal elements by direct microscopical examination, culture was positive in 51% cases [8].

*T. rubrum* was the predominant isolate in the present study in 69 cases (65.09%). Other workers who reported. *T.rubrum* as predominant isolate in their studies, were Singh S et al in 2003– 73.27% [11]. Mohanthy JC et al in 1998 – 68.34% [9], Bindu V et al in 2002-66.2% [10], Sumana V et al in 2004– 60%-[9], Peerapur B V et al in 2004– 43.7% [12], Gupta BK et al in 1993 -42.42%.[1]

## CONCLUSION

This study highlighted that in Trichophyton species, *T.rubrum* is the most common etiological agent's .Dermatophytosis is a trivial disease but has lot of psychological effect.

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