How to Cite:
Jebara, R. K., Abdullah, A. B. A. S., & Kalaf, A. J. (2022). Isolation and characterization of dermatophytes and tinea corporis infections in wasit province, Iraq. *International Journal of Health Sciences*, *6*(S7), 3355–3361. https://doi.org/10.53730/ijhs.v6nS7.12475

Isolation and characterization of dermatophytes and tinea corporis infections in wasit province, Iraq

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***Abstract*---** Background: A mycotic infection can result in a variety of human disorders. They are widespread around the world, but are more common in tropical nations like India where the temperature and humidity are more conducive to their persistence and activity. Purpose: The present study were determines the incidence of tinea infections and their dermatophytes in Wasit Province, Iraq. Result: A total 125 scraping samples with dermatophytes infections collected. About 50\125(40%) were infected with Tinea corporis. Among them, which three species were identified distribution to 26 cases were *Trichophyton mentagrophytes* with a percentage of 52%, was the most frequently isolated dermatophyte 12 cases were *Trichophyton rubrum* with a percentage 24%, and 12 cases were *Microsporum canis* with a percentage 24%. Conclusion: *T. mentagrophytes* reported as a high incidence in patients followed by Tinea corporis.

***Keywords*---**Fungal infections, Dermatophytes, Tinea, Trichophyton.

Introduction

Human infections produce a wide spectrum of disorders. They are found all across the world, but are more common in tropical nations like India, where the warmth and humidity are more conducive to their activity and persistence (1, 2). Dermatophytes, a kind of keratinophilic fungi that require a lengthy incubation period to thrive, are the culprits behind Tinea corporis. Although the clinical

manifestation of ringworm infection is extremely typical, it is frequently misdiagnosed and poorly treated (3). The widespread use of skin creams and ointments containing broad-spectrum steroids is largely to blame for this. Tinea corporis is most often caused by *T. rubrum* and *M. canis* (4, 5, 6). *T. rubrum*, which is the most frequent cause of Tinea corporis in North America, is by far the most frequent cause of dermatophytosis globally (7, 8). Conversely, *M. canis* is frequently the source of Tinea corporis brought on by intimate contact with dogs or cats (9,10).

The current study will be useful in estimating the prevalence of the most common fungus that cause Tinea corporis infections in patients and offers details on the afflicted sites and cases in district Wasit Province.

Material and method

A total of 125 samples were obtained from suspected Tinea corporis patients at AL-Karama hospital. Skin scales or hairs were collected on a sterile container for diagnosis and culture identification after the infected region was wiped with 70% ethanol. a sample was chosen for direct microscopic analysis for the presence of fungal components and mounted with 10% potassium hydroxide (KOH), and slides were gently heated to dissolve the sample cells. Standard procedures were used to culture the isolates on Sabouraud Dextrose Agar (SDA). The isolates were inspected macroscopically and microscopically after staining with lacto-phenol cotton blue and in vitro testing (11).

Statistical analyses

All data were statistically analyzed using the Statistical-Package-for-Social-Science (SPSS, version 26.0) for Windows program. Chi Square was used to assess all results that had a significant level ($P \leq 0.05$).

Results and discussion

Isolation and identification of fungal infections

KOH positivity was found in all 125 specimens, while culture positivity was found in 120/125 samples who had or been suspected of having dermatophyte infections between December 2021 and April 2022. The greatest isolation rate was achieved in opportunistic mycoses, with 40 cases containing 32% Aspergillus fungus and 19 cases containing 15.2% Penicillium fungi. There were 11 instances with a Candida fungus proportion of 8.8%, and the percent of negative culture were 5(4%). Dermatophytes were identified in 50(40%) of the specimens, with *T. mentagrophytes* being the most prevalent isolate in skin samples (26 instances). In the present study were significant that the importance of mycological examination in the diagnosis of Tinea corporis for their effective management. The results in the present study were showed that infection with Tinea corporis was the highest among males and females. No significant associated between microorganism (M.O) and sex, as shown in the Table 1.

Table 1: Distribution of *Dermatophytes* spp.

M.O isolates	Total	Male	Female	*P*-value
T. mentagrophytes	26	13	13	
T. rubrum	12	8	4	
M. canis	12	7	5	Chi square = 2.925
***Aspergillus* spp.**	40	22	18	*P*-Value<0.818
***Penicillium* spp.**	19	11	8	
***Candida* spp.**	11	4	7	
Negative sample	5	2	3	
Total	125	67	58	

M.O= Microorganisms

In several additional published investigations, the significance of non-dermatophyte mold species in skin-related diseases has been emphasized (12). However, there is still disagreement on the degree to which non-dermatophyte molds can truly result in dermatophytosis, particularly when a dermatophyte is present at the same time. Consequently, more research illustrating how this group of fungus causes infection is required. Aspergillus spp. was the most common mold species identified in the current investigation that was not a dermatophyte. Other studies confirm our findings (13).

Any dermatophyte can produce ringworm of the body, which often affects the trunk, shoulders, or limbs and sometimes the face (with the exception of the bearded region). A ringworm, often known as Tinea corporis, as shown in the Figure 1. Which will be the focus of the research and the rest of the fungi are outside the topic of research

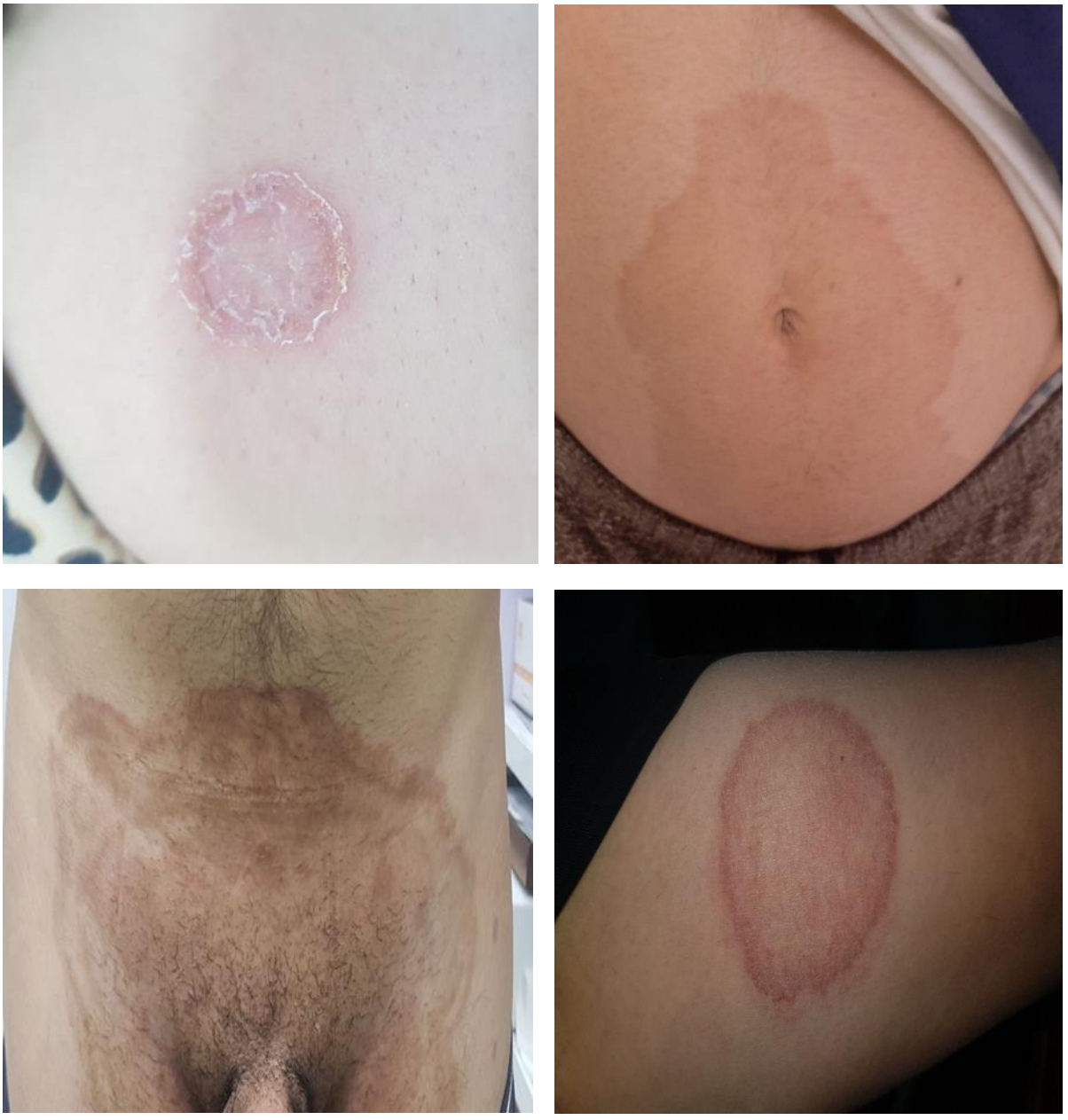

Figure1: Dermatophytes infection (Tinea corporis)

Depending on KOH direct microscopy (Figure 2), SDACC culturing on agar. The isolated of M.O (50 isolates) were distinguished to three species of dermatophytes, including *T. mentagrophytes*, *T. rubrum*, and *M. canis*.

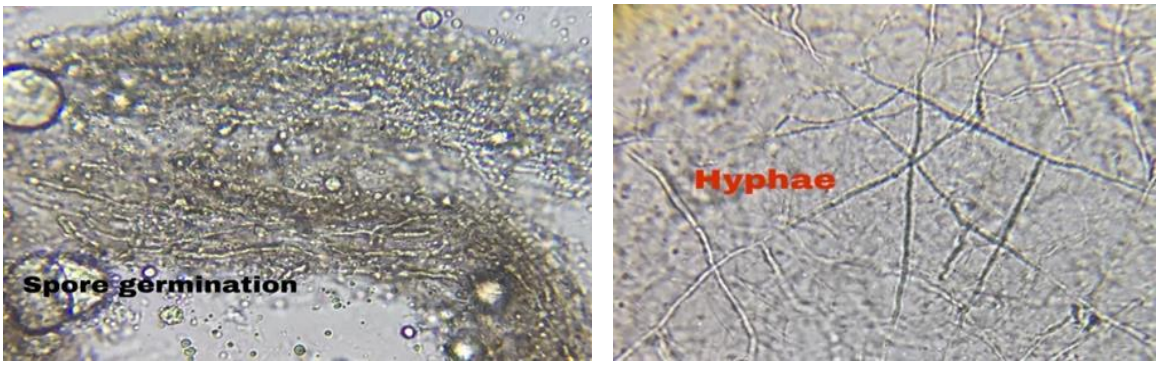

Figure 2: KOH direct microscopy

The dermatophytes distribution categorize to 26(52%) of isolates were *T. mentagrophytes*, 12(24%) of isolates were *T. rubrum*, and 12(24%) of isolates were *M. canis*.

The results in the present study agreed with other study in India, Who showed that an increase in the *T. mentagrophytes* occurrence (14). Another results showed that *T. mentagrophytes* emerged as the most prevalent dermatophyte, with prevalence rates ranging from 75.9% to 77.5%, followed by *T. rubrum* and sometimes, other *Trichophyton* spp. (15). A pathogen transition from *T. rubrum* to *T. mentagrophytes* had obviously occurred concurrently with the appearance of morphologically novel, therapy-refractory types of tinea in India. As the main cause of *T. cruris*, Tinea corporis, and tinea, this dermatophyte mainly replaces the infections previously discovered in India, especially *T. rubrum*. Another study showed that *M. canis* accounted for 20.7% of Tinea corporis of the trunk (16). No significant difference between type of M.O and site of fungal infections. The number and site of isolated fungi shown in the Table 2.

Table 2: Distribution of Dermatophytes spp., according to site of fungal infections

M.O isolates	**total**	**Groin**	**Arm**	**Trunk**	**Chest**	**Neck**	**Legs**	**Face**
T. mentagrophytes	26	7	6	5	3	2	2	1
T. rubrum	12	3	2	3	2	1	1	0
M. canis	12	2	2	2	1	1	2	2
Total	50	12	10	10	6	4	5	3

P-value<0.954, Chi square= 5.112

According to the current study, men 62.2% were more likely than women 37.8% had dermatophytosis. This may be explained by the fact that men are more likely than women to be exposed to dermatophytes because they engage in more outside

activities, which increases sweating and the growth of fungus (17). The results are consistent with other studies, and the lower prevalence in women may be attributable to their unwillingness to seek medical assistance, especially in isolated regions where there may be a shortage of female physicians or specialists (18, 19). On the other hand, another study showed that the dermatophytosis affected females more commonly than males (20). Progesterone is expected to have a significant role in suppressing dermatophyte proliferation *in vitro*, which is likely to be the cause of this gender disparity (21).

Conclusion

1- The increased incidence of mycotic disorders that are difficult to cure around the world, the most common of which is dermatophytosis, has drawn a lot of attention to dermatophytosis research in recent years. a skin condition that is contagious and widespread.

2- *T. mentagrophytes* reported as a high incidence in patients with Tinea corporis.

3- Also, through this study it was found, the rate of infection in men is greater than in women.

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