

Dermatophytes

Afia Zafar

Dermatophytes are a group of closely related fungi that can be described as anthropophilic, zoophilic or geophilic depending upon whether their normal habitat is human being, animal or soil. Dermatophytoses or infection of superficial keratinised tissues (skin, nail and hair) are characterised by ring-shaped lesion. Skin scrapings show hyaline septate branching hyphae or arthroconidia.

Table 3.5: Dermatophytes

Epidermophyton	Trichophyton	Microsporum
<i>E. floccuosum</i>	<i>T. mentagrophytes</i> <i>T. rubrum</i> <i>T. verrucosum</i> <i>T. tonsurans</i> <i>T. violaceum</i>	<i>M. canis</i> <i>M. audouinii</i> <i>M. equinum</i> <i>M. fulvum</i> <i>M. gypseum</i>

Table 3.6: Types of dermatophytoses

- | | | |
|---|--|--|
| <ul style="list-style-type: none"> • Tinea capitis (head) • Tinea barbae (face) | <ul style="list-style-type: none"> • Tinea corporis (body) • Tinea unguinum (nail) | <ul style="list-style-type: none"> • Tinea pedis (foot) |
|---|--|--|

Clinical Presentation

Tinea corporis



Female patient presented with a 3-week history of itchy rash on chest and recent development of erythematous annular plaques of variable sizes. Lesions resolved after treatment with systemic and topical antifungals.

Fig. 3.4-1

Tinea barbae with secondary bacterial infection



Fig. 3.4-2

Male patient presented with 2-month history of itchy erythematous rash with inflammatory papules and pustules localised to coarse facial hair (beard). Lesions resolved after improvement in hygiene and treatment with systemic and topical antifungals, and antibiotics.

Tinea capitis

Fig. 3.4-3



Patient presented with 6-week history of patchy hair loss, erythema, nodular and pustular lesions, kerion formation, and scarring. Lesions resolved after treatment with systemic terbinafine for 8 weeks and topical antifungal.

Tinea corporis

Fig. 3.4-4



Female patient presented with 1-month history of an itchy and enlarging annular plaque lesion on leg. Treated with topical antifungals.

Onychomycosis

Fig. 3.4-5



Patient presented with 3-month history of progressive thickening and discolouration of nail plate with paronychia. Responded to 2-month long pulse therapy with itraconazole.

Tinea unguium

Fig. 3.4-6



Ridging, onycholysis, thickening and discolouration of nail plate. Visible inflammation of nails folds.

Tinea imbricata (Tokelau) caused

by Tinea concentricum

Fig. 3.4-7



Tinea faciei

Fig. 3.4-8



Young patient presented with 3-week history of pruritic and crusting annular concentric rings on face. Responded to treatment with topical antifungals and improved hygiene.

Young patient presented with 3-week history of erythematous and scaly plaques on face. Treated with topical antifungals.

Tinea pedis (before treatment)

Fig. 3.4-9

Tinea pedis (after treatment)

Fig. 3.4-10



Patient presented with a 5-week history of intertriginous dermatitis of toes that spread to involve the sole of the foot. Characterised by peeling, maceration and fissuring of skin.



Patient responded to 6-week therapy of oral terbinafine and topical antifungals, and improved hygiene.

Tinea corporis

Fig. 3.4-11

Onychomycosis

Fig. 3.4-12



Patient presented with 2-week history of multiple, itchy annular plaques on arm. Responded to topical antifungals.



Patient presented with 12-month history of nail dystrophy of one toe nail gradually involving all toe and finger nails on both hands and feet. There was progressive discolouration, thickening and crumbling of nail plates with some degree of onycholysis. Treated with oral terbinafine.



Female patient presented with 5-month history of discrete and confluent asymptomatic patches of hypo- and hyperpigmentation with mild scaling on face. The lesions gradually extended to involve the trunk. Treated with topical antifungals and systemic fluconazole (weekly for 1 month), and counselled about improving hygiene. The causative agent is *Malassezia furfur*.

Microsporum canis

M. canis is typically hosted by cats and dogs (zoophilic), and causes infections in humans through transmission by direct and indirect contact. It is the most common cause of tinea capitis and tinea corporis in humans. On microscopic examination, it displays characteristic macroconidia as well as microconidia.

M. canis, front view of culture on SDA

Fig. 3.4-14

M. canis, reverse view of culture on SDA

Fig. 3.4-15



Slow growing (5 cm in 1 week), pale buff to white colony, with yellow to colourless radiating edge.

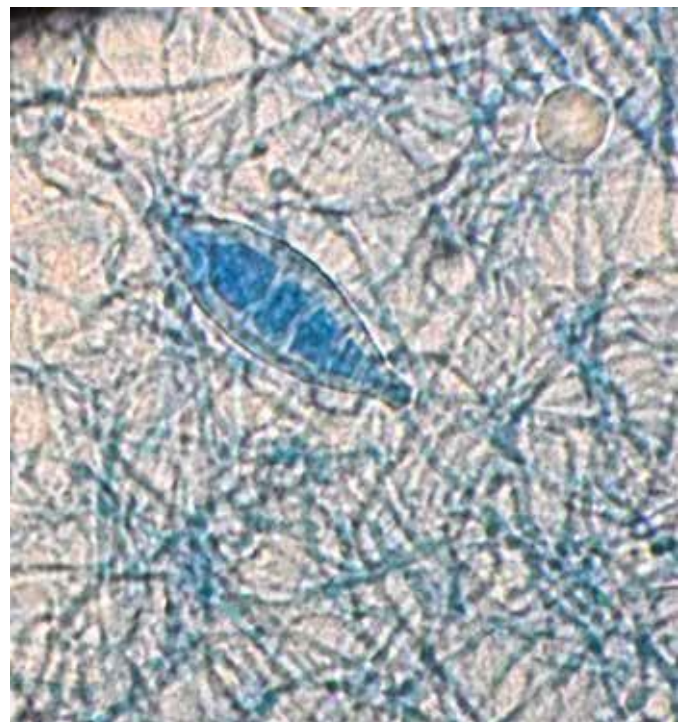
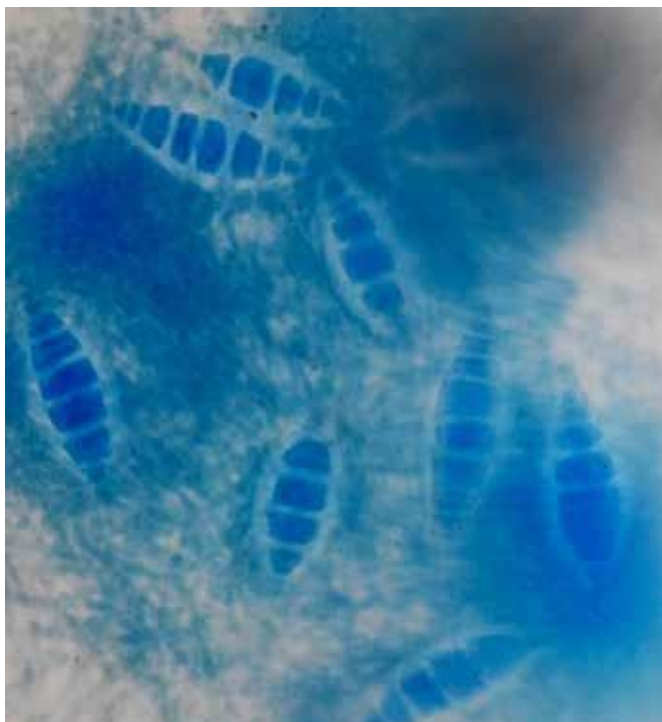
Bright yellow to colourless at the edge.

M. canis, LPCB wet mount preparation

Fig. 3.4-16

M. canis, LPCB wet mount preparation

Fig. 3.4-17



Predominantly large macroconidia concentrated in the centre of the colony. (x10)

Spindle-shaped microconidium with rough thickened wall and curved to one side. (x40)

Microsporium gypseum

M. gypseum is commonly found in humid soil (geophilic), and results in hair, skin and nail infections.

M. gypseum, front view of culture on SDA

Fig. 3.4-18

M. gypseum, front view of culture

Fig. 3.4-19



Slow growing colony (4-5 cm in 1 week), powdery in texture and buff to cinnamon colour.



Buff to pinkish colour colony.

M. gypseum, LPCB wet mount preparation

Fig. 3.4-20



Numerous macroconidia and very few microconidia. Macroconidia are elliptical with thin roughened walls and 4-6 septa. (x40)

Trichophyton rubrum

T. rubrum is an obligate human pathogen not found in environment. It is a common cause of athlete's foot, ring worm and jock's itch.

T. rubrum, reverse view of culture plate
21

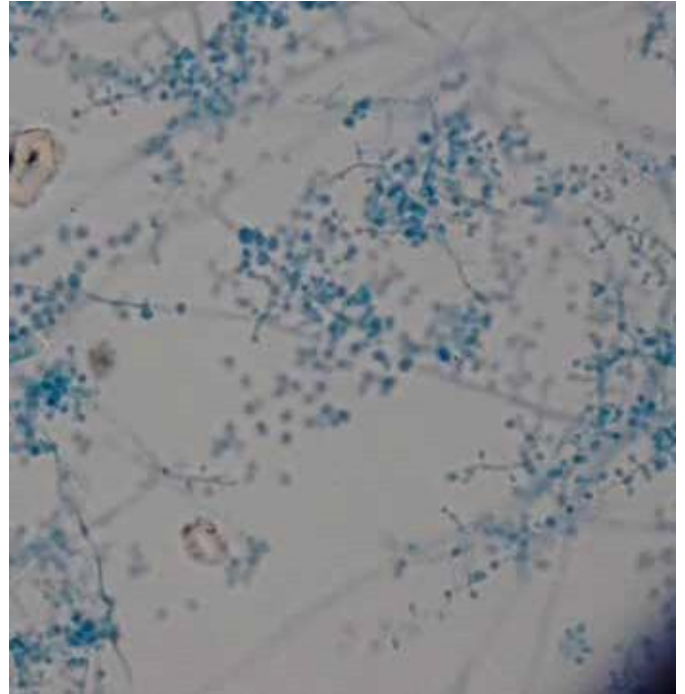
Fig. 3.4-

T. rubrum, LPCB wet mount
preparation

Fig. 3.4-
22



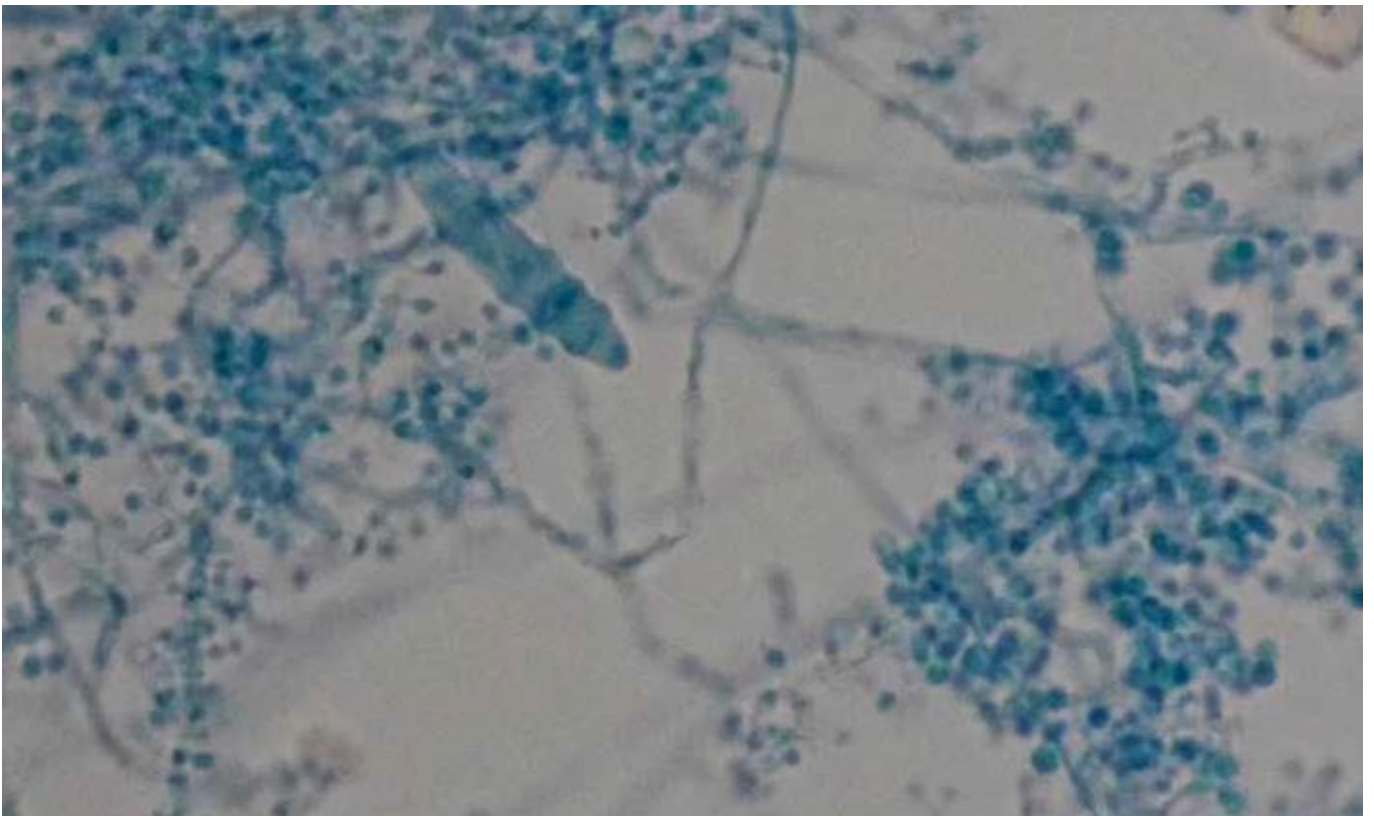
Deep red, brown, yellow and orange coloured colony. White granular or fluffy colonies on front.



Sparse clubbed microconidia, formed along the sides of the hyphae. Macroconidia absent. (x10)

T. rubrum, LPCB wet mount preparation

Fig. 3.4-23



Aleurosporulation. (x40)

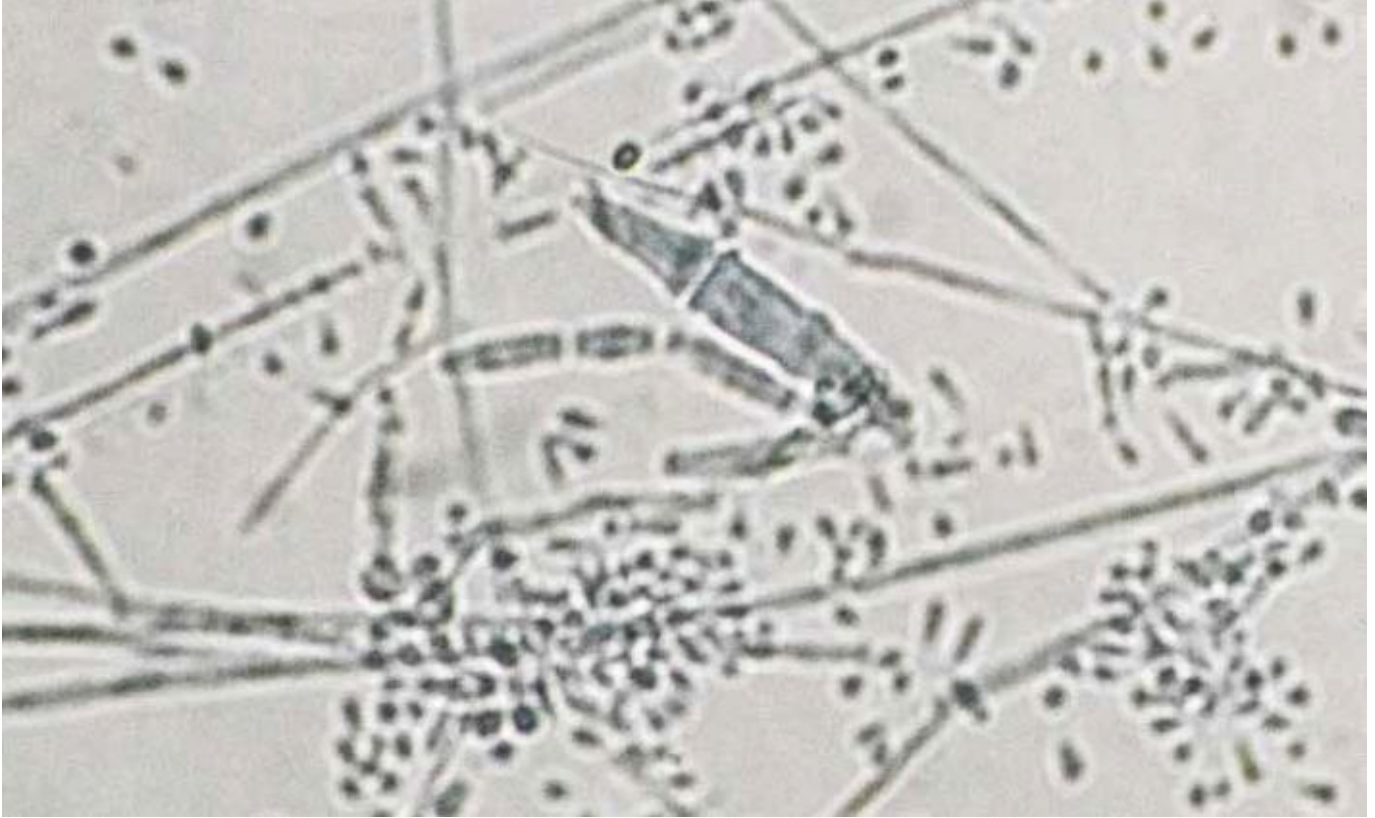
Trichophyton mentagrophytes

T. mentagrophytes is found in warm and humid places such as swimming pools and public showers, and results in tinea capitis, tinea corporis, and tinea pedis.

Culture on SDA shows flat powdery to granular colonies that appear white to cream on front and cream to brown on reverse with radiations (not shown).

T. mentagrophytes, LPCB wet mount preparation

Fig. 3.4-24



Numerous round, smooth-walled micronidia along branching hyphae. Typically found in dense clusters. Macroconidia are cylindrical with thin walls and 3-4 septa. Sometimes spiral hyphae are seen (not shown). (x40)

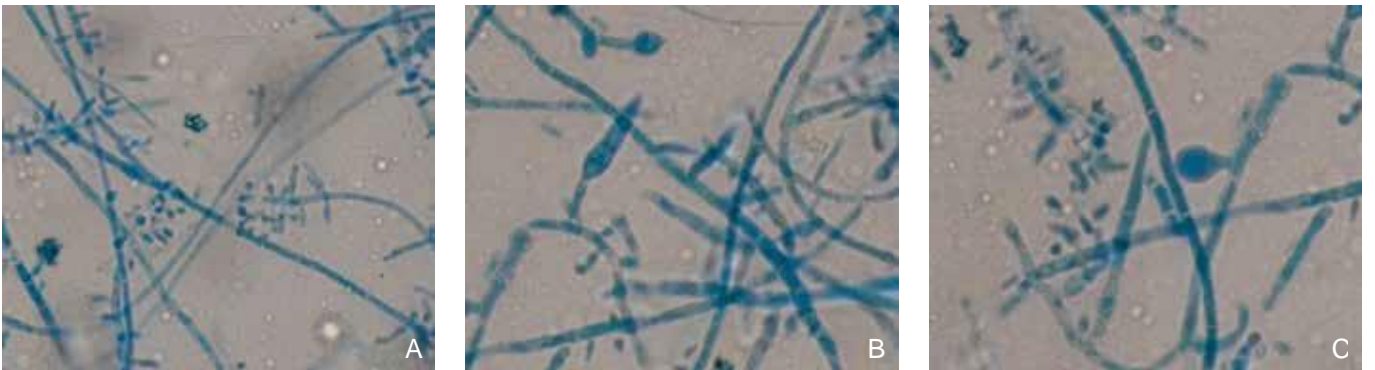
Trichophyton tonsurans

T. tonsurans is found in indoor environments, and causes tinea capitis and tinea corporis.

Colonies on SDA are white powdery, flat sometime folded in the centre in the front and yellow to reddish brown on reverse (not shown).

T. tonsurans, LPCB wet mount preparation

Fig. 3.4-25



(A) Abundant microconidia, large oval to club shaped, growing alongside hyphae; (B) Numerous macroconidia; (C) Up to 10 septa sometime loose content and structure. (x40)

Trichophyton violaceum

T. violaceum is commonly found in environment, and usually isolated in tinea capitis. Microscopically, *T. violaceum* reveals septate hyphae, often distorted, with micro- and macroconidia extremely rare (not shown).

Mixed culture of *T. violaceum* and *T. tonsurans*, front view of culture plate on SDA

Fig. 3.4-26



Glabrous textured, heaped-up purple-to-deep red colonies of *T. violaceum* (marked by arrow) growing on SDA from skin scrapings of a taenia imbricata patient. Larger buff-coloured felt-like colonies of *T. tonsurans* can also be observed arising from the same site. Both isolates have the same colour on front and reverse. Growth of *T. violaceum* is very slow, taking more than 7 days; *T. tonsurans* is relatively faster, taking 4-5 days.

Epidermophyton flocculosum

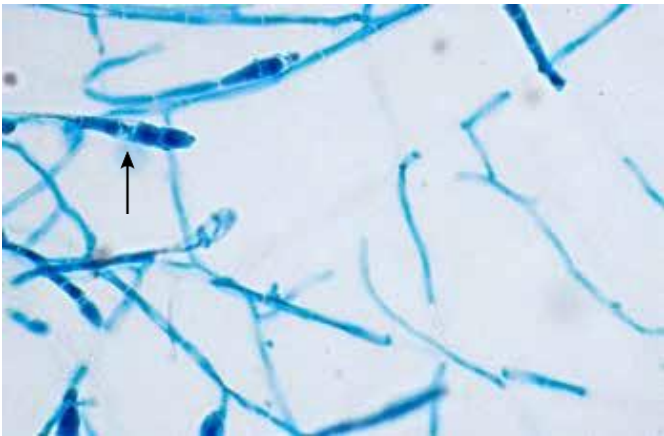
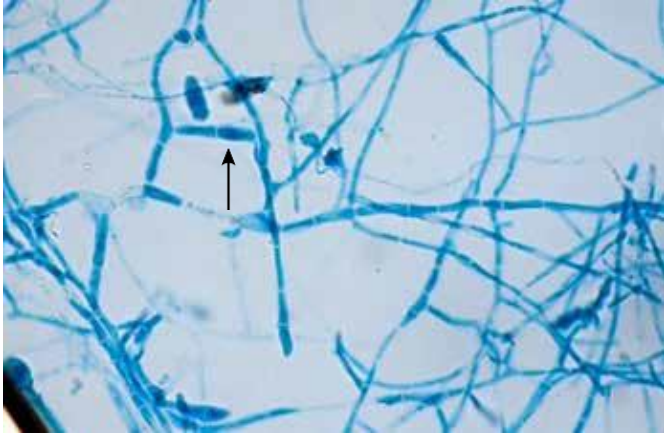
E. flocculosum is a common flora of humans, domesticated and wild animals, and found in gyms and showers. It is known to cause tinea pedis, tinea cruris, tinea corporis and onychomycosis.

Culture on SDA shows flat, powdery khaki colonies with colourless submerged edges in front and pale brown on reverse (not shown).

E. flocculosum, LPCB wet mount preparation Fig. 3.4-27

Long septate macroconidia arising in a cluster

Fig. 3.4-28



Predominantly oval- and club-shaped macroconidia with smooth medium thickness walls and 2-4 septa. (x40)