

A stack of books is shown from a low angle, with the spines of several books visible. The books have various colored covers, including red, orange, and yellow. A semi-transparent gradient overlay in shades of red and orange is positioned over the right side of the books. The text 'SUPERFICIAL MYCOSES' is written in white, bold, uppercase letters on this overlay. Below it, the name 'Dr. Tanmay Mehta' is written in a smaller, black, sans-serif font.

SUPERFICIAL MYCOSES

Dr. Tanmay Mehta

Tinea Versicolor (pityriasis versicolor)

- **Agent:** lipophilic fungus *Malassezia furfur*
- **Clinical Manifestation**
 - Flat-round scaly patches of hypo- to hyperpigmentation of skin
 - Lesions are non-inflammatory and non-pruritic (or rarely pruritic)
- Areas rich in sebaceous glands - neck, chest, or upper arms





Clinical Manifestations

- **Seborrheic dermatitis**
 - Erythematous pruritic scaly lesions - **dandruff in adults and cradle cap** in babies
 - Severe in patients with AIDS
- **Atopic dermatitis**
- **Folliculitis**
- **Disseminated infection** - rarely

Laboratory Diagnosis

- Mostly clinical diagnosis
- **Sample:** Skin scrapings
- **Direct microscopy:**
 - KOH - Mixture of budding yeasts and short septate hyphae are seen - **spaghetti and meatballs appearance**





Tinea Versicolor

- **Culture:** SDA with olive oil overlay - '**fried egg**' *colonies* appear after incubating for 5–7 days at 32–35°C
- **Urease test:** positive
- **Wood's lamp examination:** golden yellow fluorescence.
- **Treatment Tinea versicolor**
 - Topical lotions - selenium sulfide shampoo, ketoconazole shampoo or cream, terbinafine cream - 2 weeks



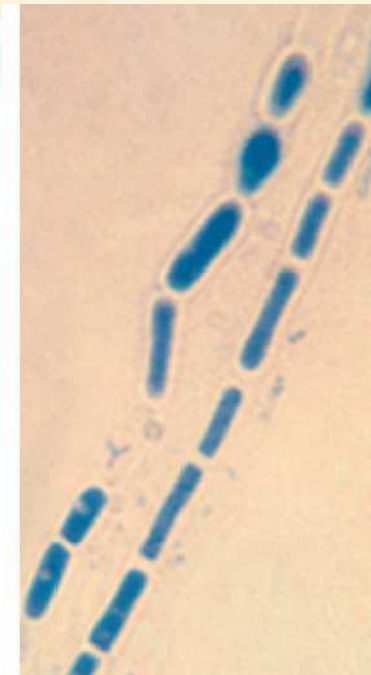
TINEA NIGRA

- Painless, black, non-scaly patches present on palm and sole
- More common in females
- Caused by *Hortaea werneckii*
- Black-colored yeast like fungus

PIEDRA

❖ White Piedra

- **White nodules** are formed on the hair shaft, which are less firmly attached
- **Agent: *Trichosporon beigelii***
 - Urease positive, yeast like fungus
 - Produces creamy white colonies, containing hyaline septate hyphae intervening with rectangular **arthrospores**



Piedra

❖ Black Piedra

- Black nodules, which are firmly attached to the hair shaft
- **Agent:** *Piedraia hortae*
- Phaeoid fungus
- Reddish brown colonies; containing dark brown thick septate hyphae with ascus containing ascospores





DERMATOPHYTOSES

- **Dermatophytoses** (or tinea or ringworm) is the most common superficial mycoses affecting skin, hair and nail
- **Dermatophytes** - Group of related fungi that are capable of infecting keratinized tissues
 - ***Trichophyton species***: Infect skin, hair and nail
 - ***Microsporum species***: Infect skin and hair
 - ***Epidermophyton species***: Infect skin and nail

Classification of dermatophytes based on their usual habitat

	<i>Trichophyton</i>	<i>Microsporum</i>	<i>Epidermophyton</i>
Anthropophilic	<i>T.rubrum</i> <i>T.mentagrophytes</i> <i>T.schoenleinii</i> <i>T.tonsurans, T.violaceum</i>	<i>M. audouinii</i>	<i>E.floccosum</i>
Zoophilic	<i>T.equinum</i> <i>T.verrucosum</i>	<i>M.canis</i> <i>M.equinum</i>	
Geophilic	<i>T.ajelloi</i>	<i>M. gypseum</i>	<i>E.stockdaleae</i>



Pathogenesis

- Acquired by direct contact with soil, animals or humans infected with fungal spores
- Predisposing factors - moist humid skin and tight ill-fitting underclothing
- **Skin:** Grow in a centrifugal pattern in the stratum corneum → **annular- or ring-shaped pruritic scaly** skin lesions with central clearing and raised edges
- **Nails:** Invade nails through lateral or superficial nail plates and then spread throughout the nails
- **Hair shafts:** invade the hair shaft or may be found surrounding it. Hairs become brittle and areas of alopecia may appear



Pathogenesis

- Lesions - not by the tissue invasion by the fungi per se; but in response to the host's inflammatory reaction elicited by fungal antigens
- Males more commonly infected as progesterone is inhibitory to dermatophyte growth
- Severity depends on the infecting fungi, immune status of the host and the site of lesion



Pathogenesis

- **Anthropophilic dermatophytes** – Commonest, cause relatively mild and chronic lesions but respond poorly to treatment
- **Geophilic and zoophilic species** - less adapted to human, produce more acute inflammatory response and severe infections; but they tend to resolve more quickly

Clinical types of dermatophytoses

Tinea capitis

Kerion	Painful inflammatory reaction producing boggy lesions on scalp. Agent- <i>T.verrucosum</i>
Favus	Cup like crust (scutula) forms around the infected hair follicle with minimal hair shaft involvement. Agent: <i>T.schoenleinii</i>
Ectothrix	Arthrospore formation occurs on the surface of hair shaft (<i>M.audouinii</i> , <i>M.canis</i> , and <i>T.mentagrophytes</i>)
Endothrix	Arthrospore formation occurs within the hair completely filling hair shaft (<i>T.tonsurans</i> & <i>T.violaceum</i>)



Clinical types of dermatophytoses

Clinical Types	Area involved
Tinea corporis	Infection of the non hairy skin of the body (trunk and limbs)
Tinea pedis (Athlete foot)	Infect first the webs between the toes, then spread to the sole in a " <i>moccasin</i> " pattern
Tinea cruris (or jock itch)	Infection of the groin area
Tinea barbae	Infection of the beard and moustache area of face
Tinea faciei	Infection of the non-bearded area of face

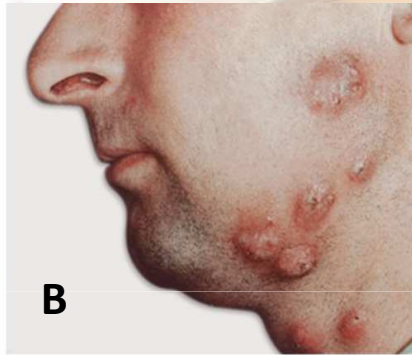
Clinical types of dermatophytoses

Clinical Types	Area involved
Tinea imbricata	Concentric lesions of the skin Agent- <i>T.concentricum</i>
Tinea unguium (nail plate infection)	Infection of nail beds Agent- <i>T.mentagrophytes</i> & <i>E.floccosum</i>
Tinea manuum	Infection of the palmar aspect of hands

Ring worm infections



A



B



C



D

A. Tinea capitis

B. Tinea faciei

C. Tinea pedis

D. Tinea corporis



Dermatophytid or Id Reaction

- Hypersensitivity to dermatophyte antigens → secondary eruption in sensitized patients
- Lesions - distinct from the primary ringworm lesions
- Occur distal to primary site and fungal culture often turns negative

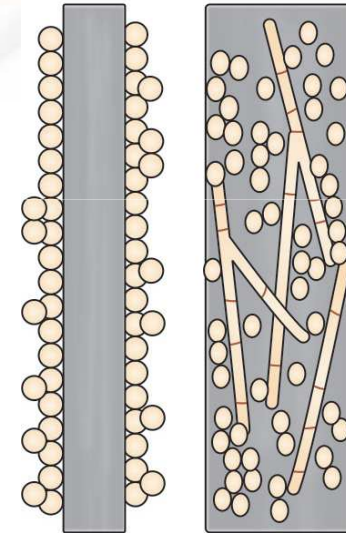
A background image showing laboratory glassware, including a beaker and a test tube, with a color gradient from yellow to red.

Laboratory Diagnosis

- **Woods Lamp Examination**
- Positive for various *Microsporum species* & *Trichophyton schoenleinii*
- Fluorescence is due to the presence of pteridine pigment in cell wall
- **Specimen Collection**
- Skin scrapings, hair plucks (broken or scaly ones) and nail clippings from the active margin of the lesions

Direct Examination

- KOH mount or calcofluor white stain - thin septate hyaline hyphae with arthroconidia
- Hair – arthroconidia on the surface of shaft (ectothrix) or within the shaft (endothrix)





Culture

- **Medium:** SDA containing cycloheximide and incubated at 26–28°C for 4 weeks
- Potato dextrose agar – better sporulation
- **Identification is made by:**
- **Macroscopic appearance** of the colonies - rate of growth, texture, pigmentation, colony topography

Colony morphology of dermatophytes



Trichophyton mentagrophytes



Microsporum canis



Epidermophyton floccosum



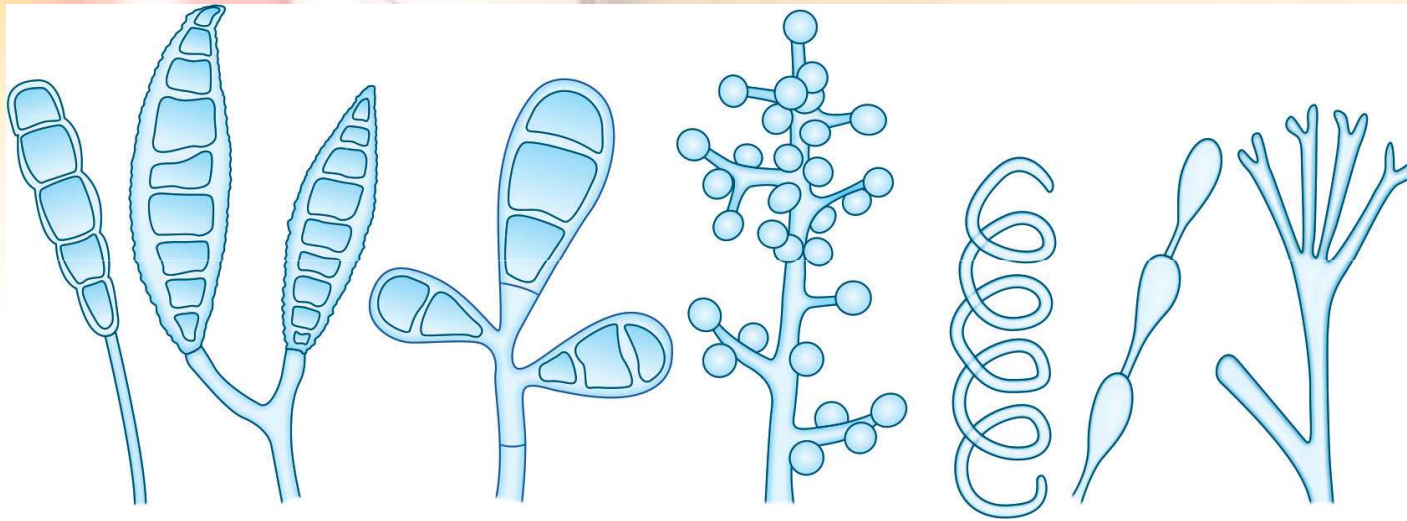
Microscopic identification

- **Microscopic appearance:** LPCB tease mount - hyphae and spores (or conidia)
 - **Conidia:**
 - **Microconidia** - small unicellular
 - **Macroconidia** – Multicellular, septate
- **Special hyphae:** hyphae such as spiral hyphae, racquet hyphae and faveic chandeliers

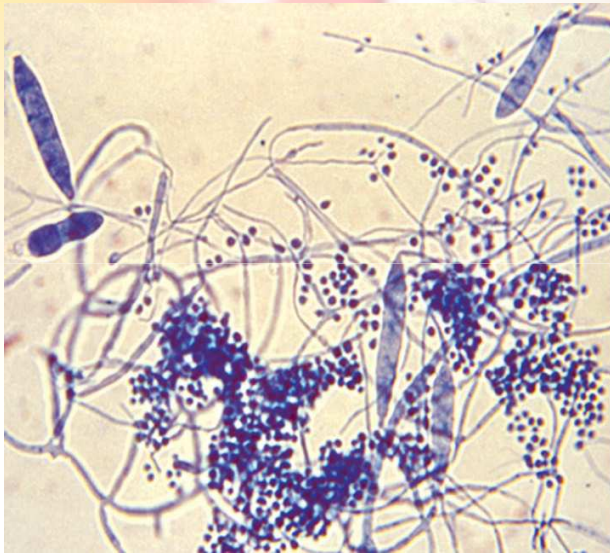
Microscopic identification

Dermatophytes	Macroconidia	Microconidia
Trichophyton	Rare, thin walled, smooth, pencil shaped	Abundant
Microsporum	Numerous, thick walled, rough, spindle shaped	Rare
Epidermophyton	Numerous, smooth walled, club shaped	Absent

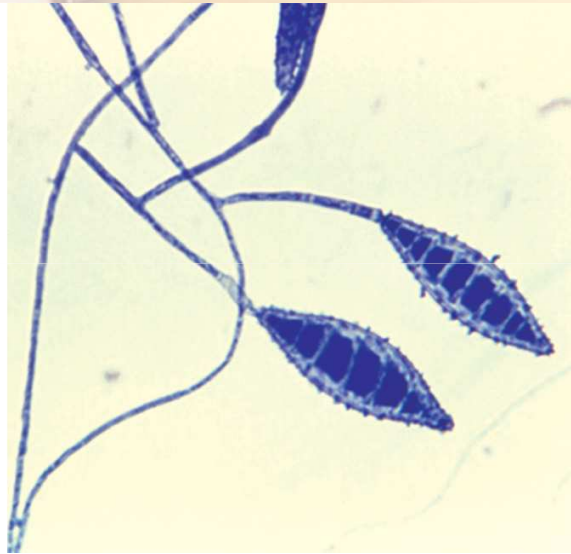
Characteristic features of dermatophytes



LPCB Tease Mounts



Trichophyton mentagrophytes



Microsporum canis



Epidermophyton floccosum

Identification of dermatophytes

Dermatophytes	Macroscopic appearance	Microscopic appearance
<i>T.rubrum</i>	Velvety, red pigment on reverse	Microconidia- tear drop shaped, plenty Macroconidia- few, long, pencil shaped
<i>T.Mentagrophytes</i>	White to tan powdery Pigment variable	Microconidia- numerous, round to pyriform Macroconidia- cigar shaped Spiral hyphae seen
<i>T.schoenleinii</i>	Smooth, waxy	Microconidia & macroconidia- rare or absent. Chlamydospores seen Hyphae- hyphal swelling & favic chandelier

Identification of dermatophytes

Dermatophytes	Macroscopic appearance	Microscopic appearance
<i>T.violaceum</i>	Slow growing, waxy Violet pigment on reverse	Microconidia & macroconidia- rare or absent Distorted hyphae seen Chlamyospores seen
<i>M. audouinii</i>	Slow growing, velvety, brownish	Thick walled chlamyospores seen Macroconidia and microconidia- rare
<i>M. gypseum</i>	Buff colored, powdery	Macroconidia- abundant, thick walled, <i>spiny, spindle shaped</i> , 4-6 septa, rounded ends Microconidia-rare

Identification of dermatophytes

Dermatophytes	Macroscopic appearance	Microscopic appearance
<i>M.canis</i>	Cottony, orange pigment on reverse	Macroconidia- abundant, thick walled, spiny, spindle shaped, up to 15 septa, pointed ends
<i>E.floccosum</i>	Powdery, folded, yellowish green	Macroconidia club or clavate shaped in clusters, 4-6 septa Microconidia- absent



Other Methods of Diagnosis

- **Hair perforation test:**
 - Fungi pierce hair producing wedge-shaped perforations
 - **Positive** – *T.mentagrophytes* and *M.canis*
- **Urease test:** *Trichophyton mentagrophytes* is urease positive
- **Dermatophyte test & Dermatophyte identification medium:** for presumptive identification - based on color change
- **Molecular methods:** PCR
- **Skin test:** detects hypersensitivity to trichophytin



Treatment

- **Oral terbinafine or itraconazole** - drugs of choice f
- **Duration** – depends on the affected site (1–2 weeks for skin lesions, 6 weeks for hair infection, 3 months for onychomycosis)
- **Pulse therapy**
- **Alternative:** Oral griseofulvin and ketoconazole
- **Topical lotion** - whitfield ointment or tolnaftate