Superficial Mycoses

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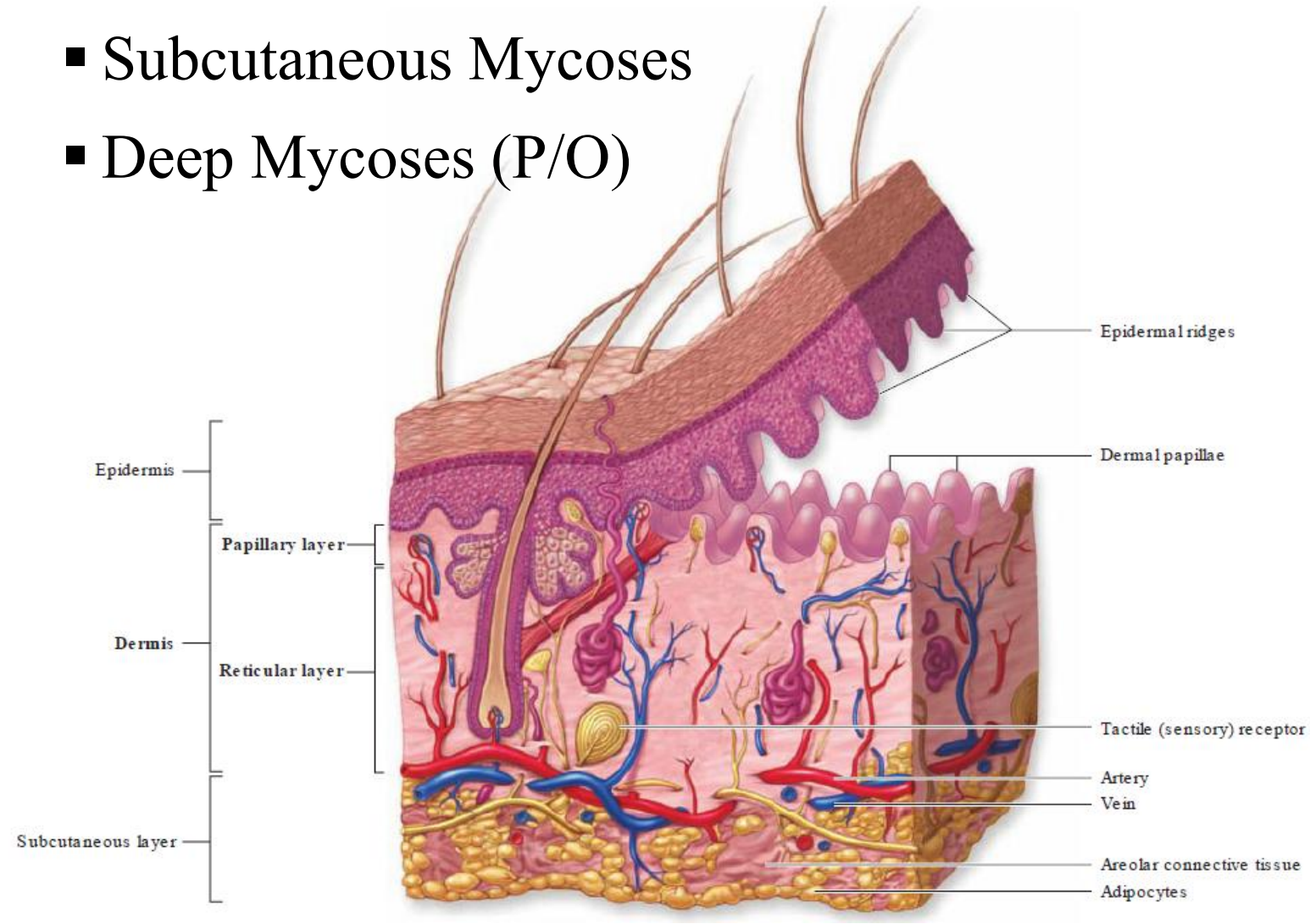
Introduction

- Superficial Mycoses
- Cutaneous Mycoses
- Subcutaneous Mycoses
- Deep Mycoses (P/O)



Superficial Mycoses

- Skin or hair shaft
- No living tissue is invaded.
- No cellular response.
- No pathological changes.

Superficial Mycoses

Tinea versicolor

Tinea nigra

Piedra

Otomycosis

Erythrasma

Trichomycosis axillaris

Tinea versicolor
(pityriasis versicolor)

- Common superficial fungal infection of the skin.
- Worldwide.
- This is a chronic, mild, and recurrent infection with mildly scaly hypopigmented or hyperpigmented macules/patches.
- Rich in sebum production, such as the trunk (especially the upper part), neck, shoulders, and upper arms.
- Adolescents and young adults.

What fungi cause Tinea versicolor?

- Dimorphic lipophilic and lipid-dependent yeasts in the genus *Malassezia*.
- *M. globose*, *M. furfur,* and *M. sympodialis*.
- *M. pachydermatis* is the only species that does not require lipid.

Kingdom:	**Fungi**
Division:	**Basidiomycota**
Subdivision:	**Ustilaginomycotina**
Class:	**Exobasidiomycetes**
Order:	**Malasseziales**
Family:	**Malasseziaceae**
Genus:	**Malassezia**

Malassezia species	Reference
*M. globosa**	Mycobiota of human skin
*M. restricta**	
*M. sympodialis**	
M. furfur *	
M. yamatoensis	
M. arunalokei sp. Nov	
M. obtusa *	
*M. slooffiae**	
M. dermatis	
M. japonica	
M. pachydermatis	Colonize the skin of animals
M. nana	
M. caprae	
M. equina	
M. cuniculi	
M. brasiliensis sp. Nov	
M. psittaci sp. Nov	
M. vespertilionis sp. Nov	

Epidemiology

- Very high in hot and humid climates.
- 50% whereas in Sweden 0.5%
- More common in men
- 25% of children and almost 100% of adults.

- Hyperhidrosis
- Oily lotion or cream
- Wearing of masks
- Malnutrition
- Poor general health
- Oral contraceptives

- Pregnancy
- Diabetes mellitus
- Topical or systemic corticosteroids
- Cushing's disease
- Helicobacter pylori infection
- Immunodeficiency
- Genetic predisposition

❑ A recent study showed oxidative stress has no role in the pathogenesis of tinea versicolor

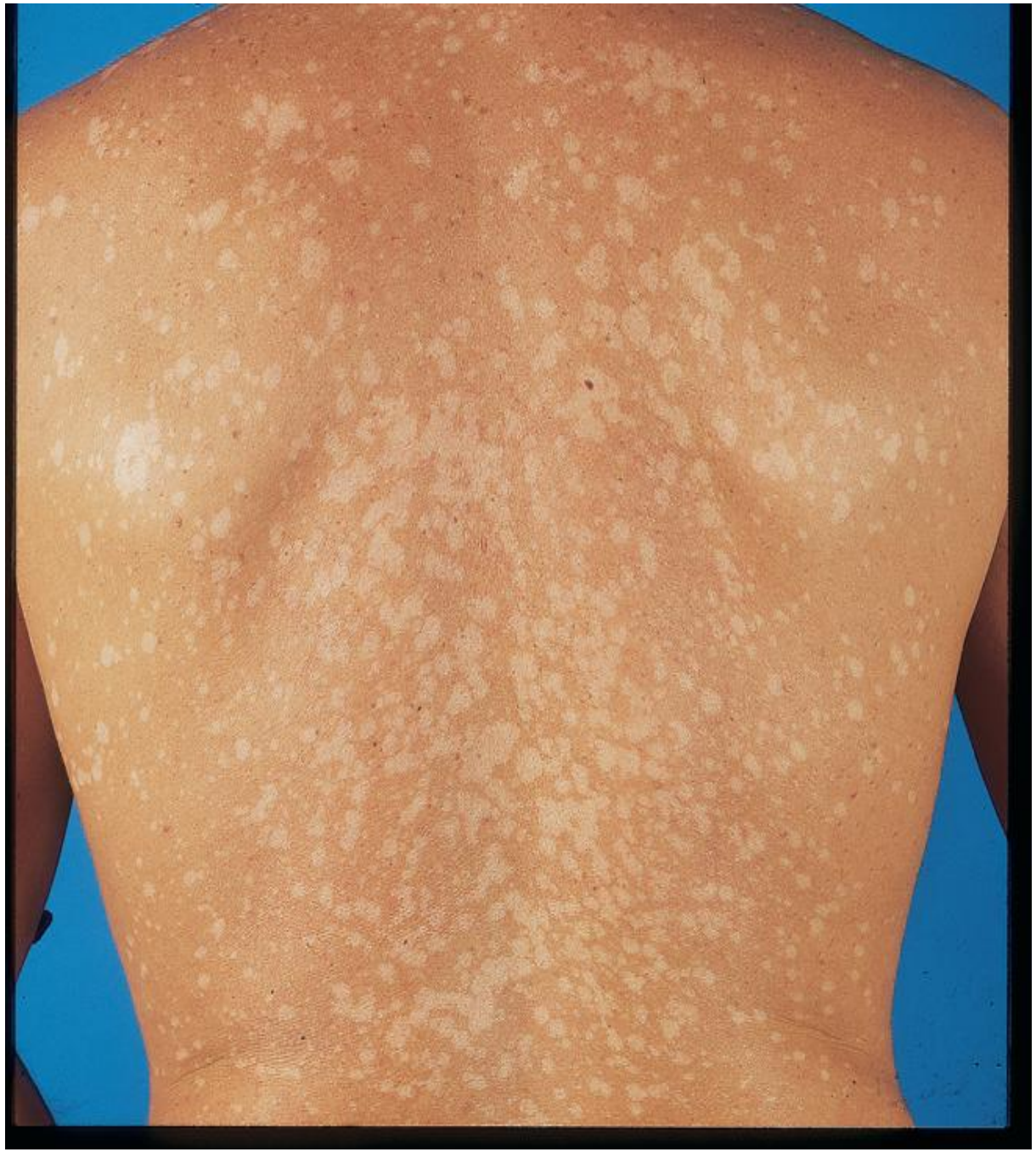
Hypopigmented lesions

- Damage to melanocytes
- Inhibition of tyrosinase by azelaic acid produced by the *Malassezia*.
- Small melanosomes and accumulation of lipid-like material in the stratum corneum, blocking ultraviolet light.

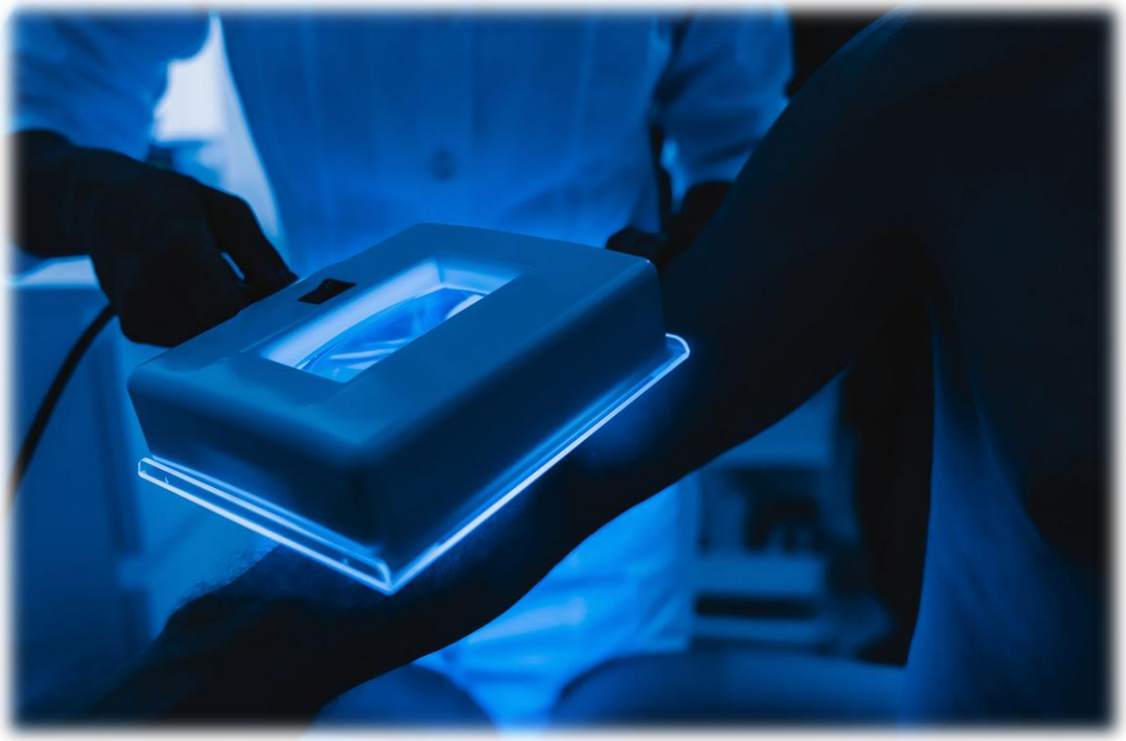
Hyperpigmented lesions

- Hyperaemic inflammatory response
- Thicker stratum corneum
- Abnormally large melanosomes

This is a poster of the once-famous rock star Peter Frampton. Note the excellent example of tinea versicolor on his shoulders.



Wood's Lamp



Show gold-yellow, yellowish-green, or coppery-orange fluorescence, although some lesions do not fluoresce.

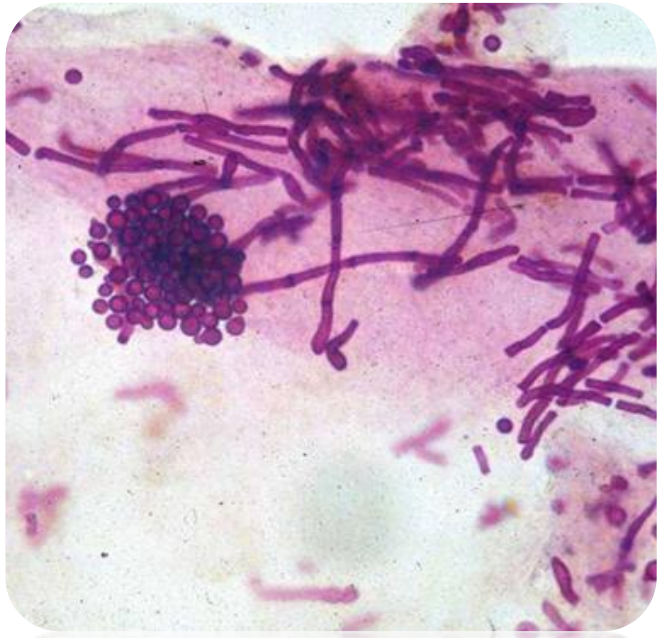
1.Clinical material:

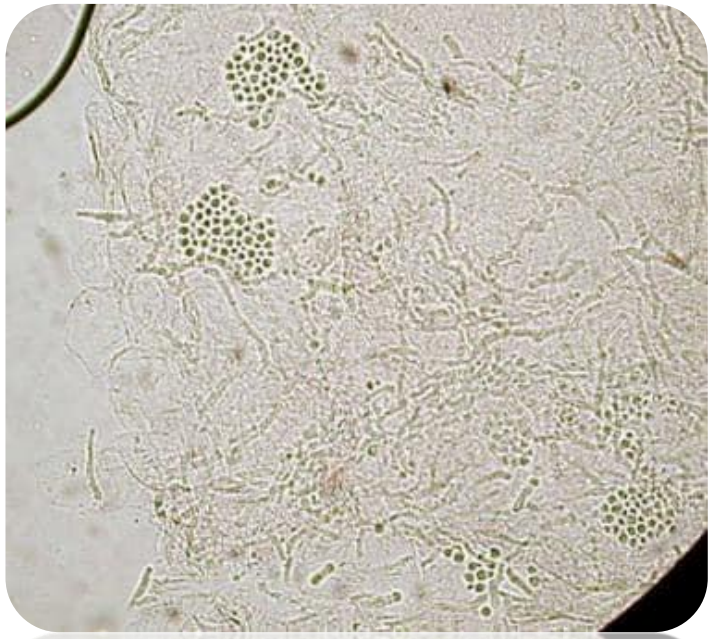
Skin scrapings from lesions, or using the cellophane tape (Scotch tape) method.

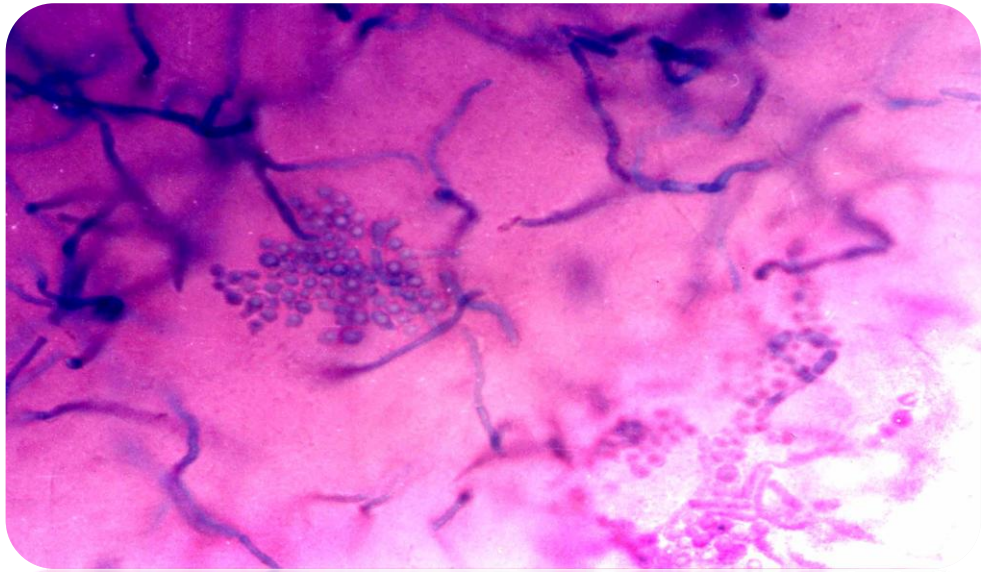
2. Direct Microscopy:

Using 10% KOH or common stains (Methylene blue, Giemsa)

Examine specimens for **Clusters of round yeast cells and short pieces of thick septate hyphae**. **(spaghetti & meatball)**







3. Culture:

These microscopic features are diagnostic for *Malassezia* spp., and culture preparations are usually not necessary.

Sabouraud dextrose agar supplemented with olive oil and the selective Dixon's agar medium.

4. Serology:

Currently, there are no commercially available serological procedures for diagnosing *Malassezia* infections.

Culture of *Malassezia furfur* on Dixon's agar (contains glycerol mono-oleate)

Differential diagnosis

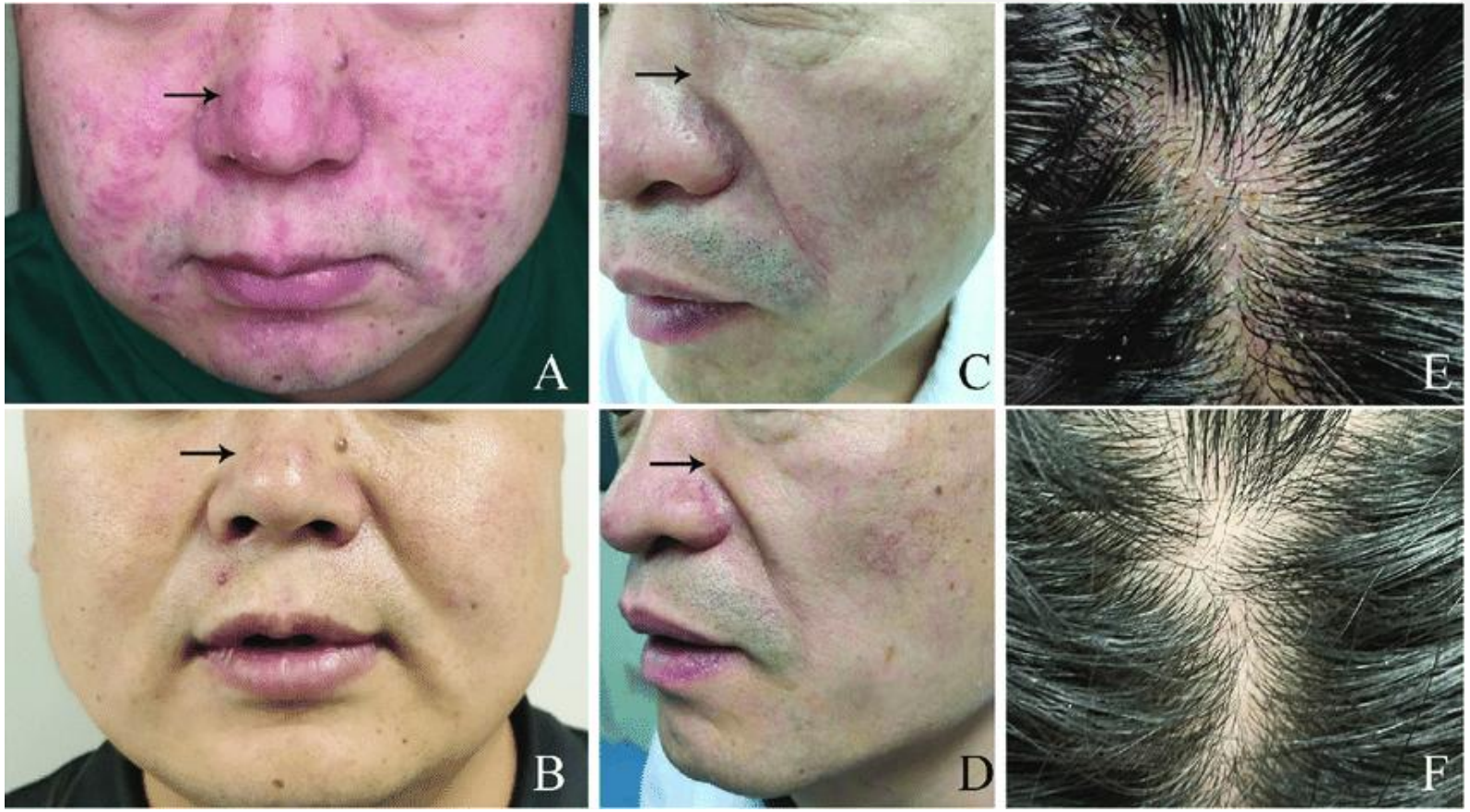
- Vitiligo
- Chloasma (melasma, “mask of pregnancy”)
- Pityriasis rosea
- Erythrasma
- Seborrheic dermatitis
- Secondary syphilis

Treatment

- 1. Use **a topical imidazole** in a solution.
- 2. **Ketoconazole shampoo** has proven to be very effective.
- 3. **Alternative treatments** include **zinc pyrithione shampoo** or **selenium sulfide lotion** applied **daily for 10-14 days.**
- 4. In **severe cases** with extensive lesions, or in cases with lesions **resistant to topical treatment, or in cases of frequent relapse, oral therapy with itraconazole [200 mg/day for 5-7 days]** is usually effective.
- The yeast cells may still be seen in skin scrapings for up to **30 days following treatment**, thus patients should be monitored in the mycological laboratory.

Other Diseases Caused by *Malassezia*

- **Seborrheic Dermatitis:** A common chronic inflammatory condition causing scaly patches, red skin, and stubborn dandruff, primarily on the scalp, face, and chest. It is strongly linked to an inflammatory response to *Malassezia*.



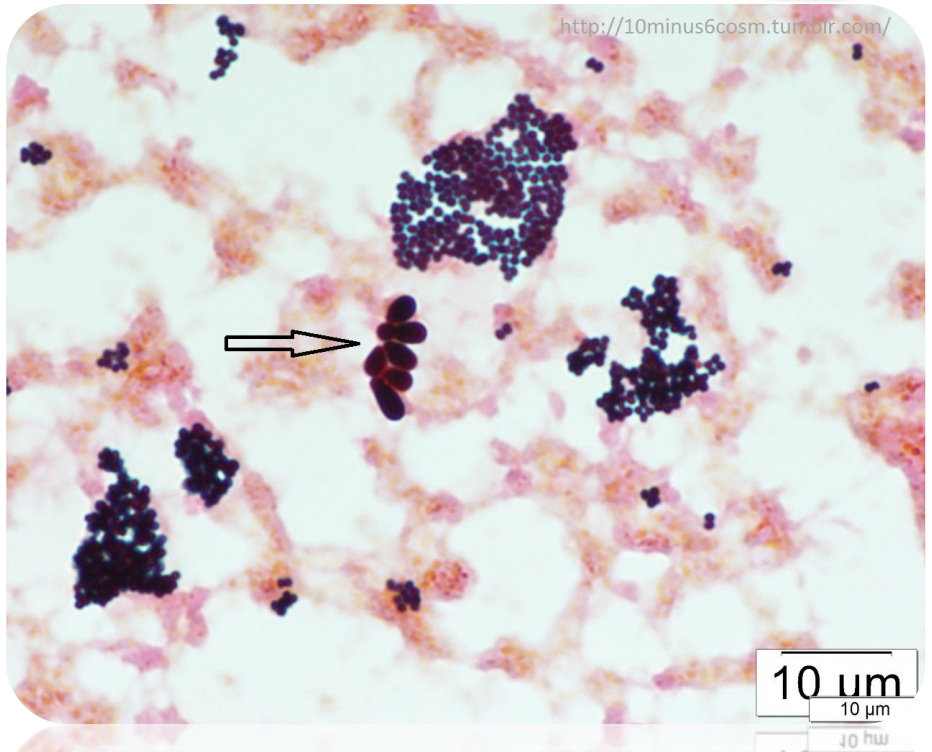
Other Diseases Caused by *Malassezia*

- **Folliculitis:** *Malassezia* folliculitis results from the yeast overgrowing and infecting hair follicles, leading to itchy, pimple-like bumps, often on the back, chest, and upper arms.

Other Diseases Caused by *Malassezia*

- **Rare Systemic Infections (Fungemia):** In patients with central line catheters receiving lipid replacement therapy, especially in infants, *Malassezia* can cause bloodstream infections (fungemia), potentially leading to sepsis.

- Diagnosis requires special culture media, and blood drawn back through the catheter is the preferred specimen.



Tinea nigra

- Rare superficial mycosis.
- Most commonly presents as a solitary, well-defined dark brown or black patch on the palms, and also appears on other body sites (soles, neck, or trunk), especially in a bilateral pattern.
- Asymptomatic and fine scaling.

Etiology

- The melanized fungus *Hortaea werneckii*.
- The transmission occurs through direct contact of microtraumatized skin and surfaces with their natural environment, characterized by high humidity and salinity.
- Person-to-person transmission is not considered.
- The prevalence in warm environments is attributed to the halotolerant and halophilic properties of *H. werneckii*, allowing it to thrive in humid and hypersaline conditions.

Epidemiology

- Commonly observed in women (2 to 1)
- Children and young adults
- Tropical and subtropical climates are prevalent in Central and South America, Asia, the Polynesian region, and Africa.
- The incubation period of the fungus is not entirely clear.
- The primary risk factor is palmar or plantar hyperhidrosis, as the conditions of humidity and hypersalinity facilitate the development of TN.
- No immunosuppressive conditions or genetic factors have been identified as risk factors.

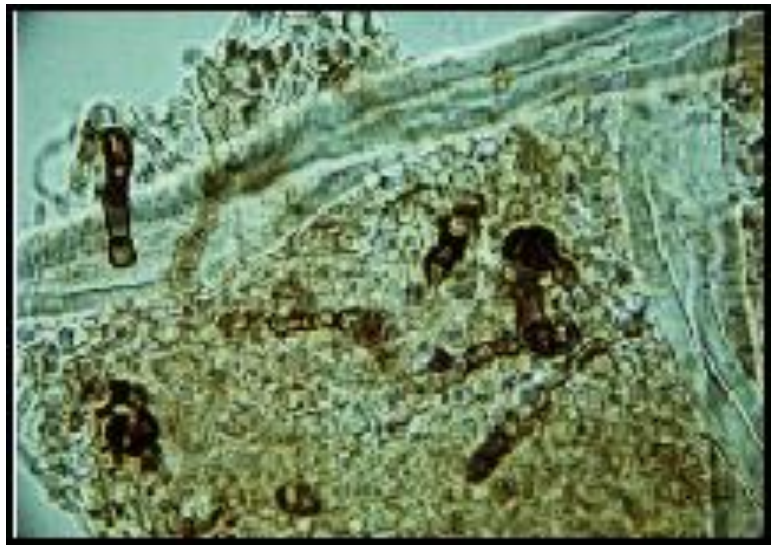
1.Clinical material:

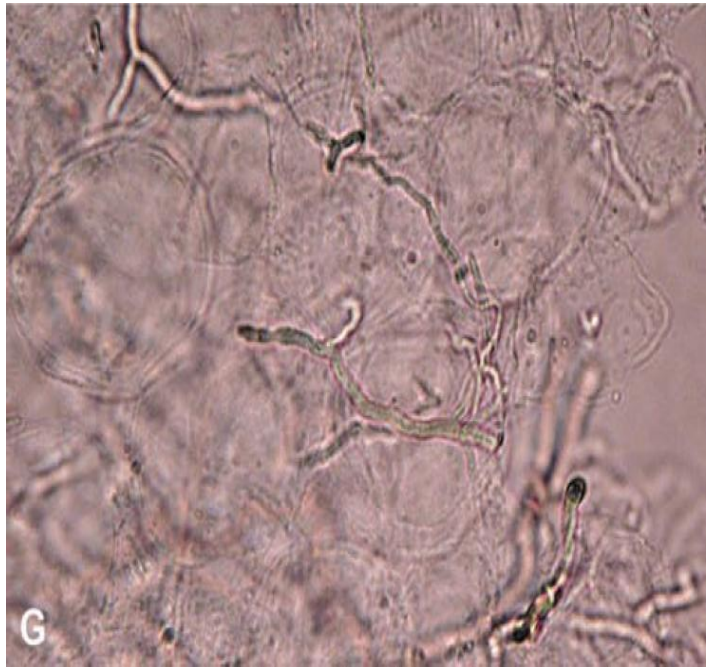
Skin scrapings from lesions.

2. Direct Microscopy:

Using 10% KOH

Examine specimens for **mycelia composed of short, tortuous dematiaceous hyphae (melanin).**





3. Culture:

After 10 days of growth on Sabouraud dextrose agar, the culture exhibits restricted, black, moist-looking colonies initially resembling yeast, which later become filamentous with wide, densely septate, thick-walled, brown hyphae.

Pigmented septate hyphal elements and **2-celled yeasts producing annelloconidia** typical of *Hortaea werneckii.*

Differential diagnosis

- **Malignant melanoma:** a type of skin cancer that develops from the pigment-producing cells known as melanocytes.

Treatment

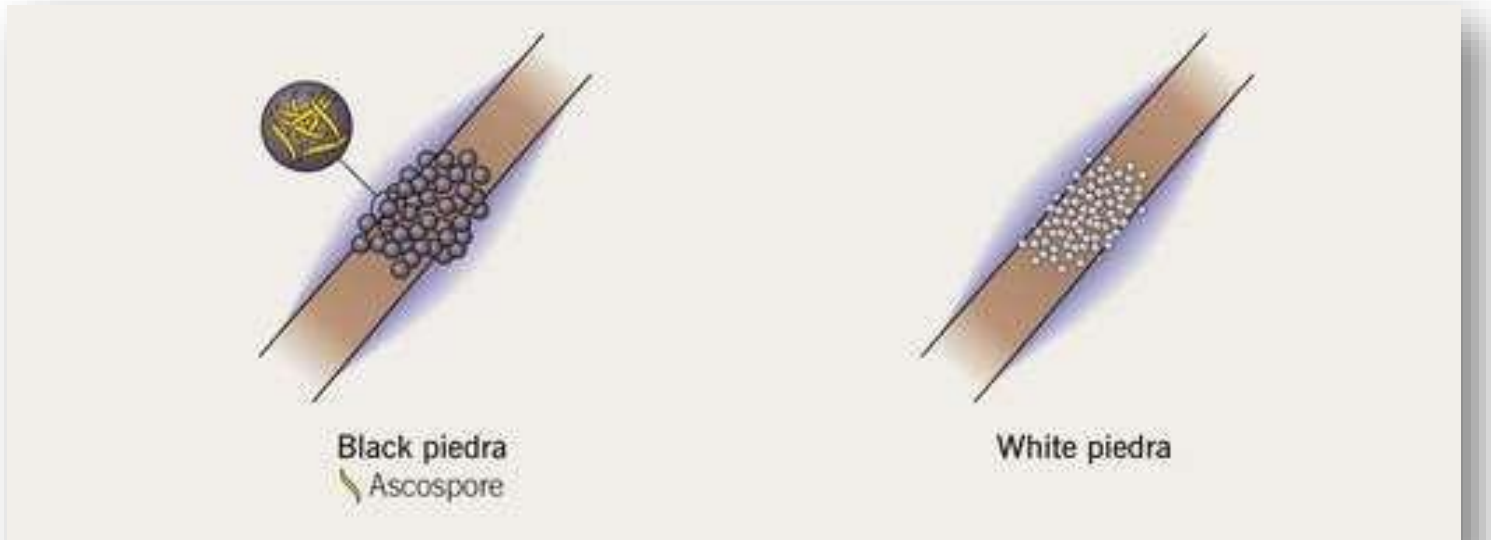
1. Topical imidazoles, including miconazole, ketoconazole, econazole, oxiconazole, and bifonazole, are typically applied twice daily until clinical resolution is achieved.

2. Oral triazoles, such as itraconazole, voriconazole, and posaconazole, are reserved for more extensive or resistant cases.

3. Whitfield's ointment, which contains 3% salicylic acid and 6% benzoic acid, has demonstrated efficacy due to its keratolytic properties and antifungal activity.

Piedra

- Piedra is a superficial fungal infection of hair shafts, which presents with small black or white nodules stuck to the shaft.
- These look like small stones, hence the name piedra, meaning 'stone' in Spanish.
- There are two types: black piedra and white piedra, caused by different fungi and named because of the color of fungal deposits they cause on the hair shaft.

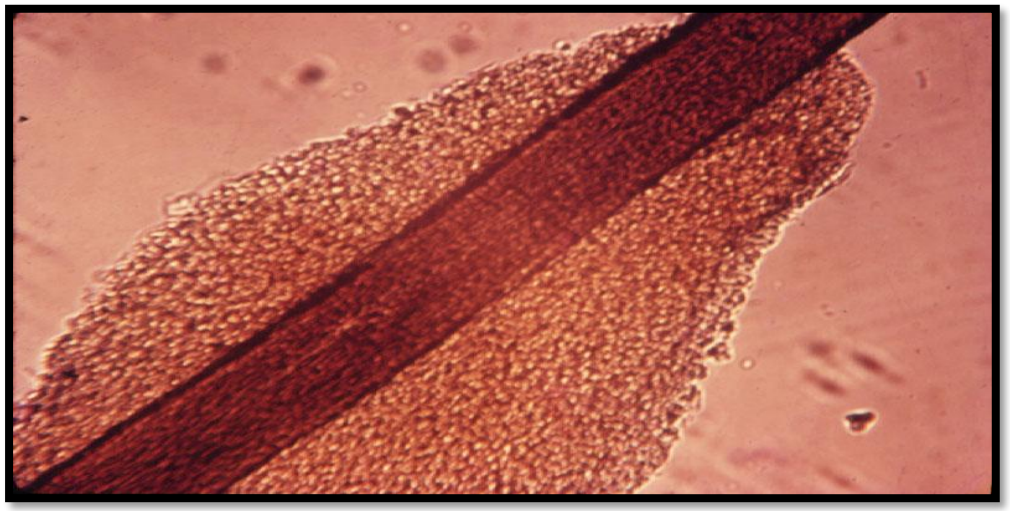


White piedra

- Caused by *Trichosporon spp*. Infected hairs develop soft, greyish-white nodules along the shaft.
- Tropical or subtropical regions.
- *Trichosporon* spp are a minor component of normal skin flora and are widely distributed in nature.
- Endogenous!

Clinical manifestation

- The presence of irregular, soft, white or light brown nodules is characteristic of white piedra.
- Infections are usually localized to the axilla or scalp but may also be seen on facial hair.
- White piedra is common in young adults.



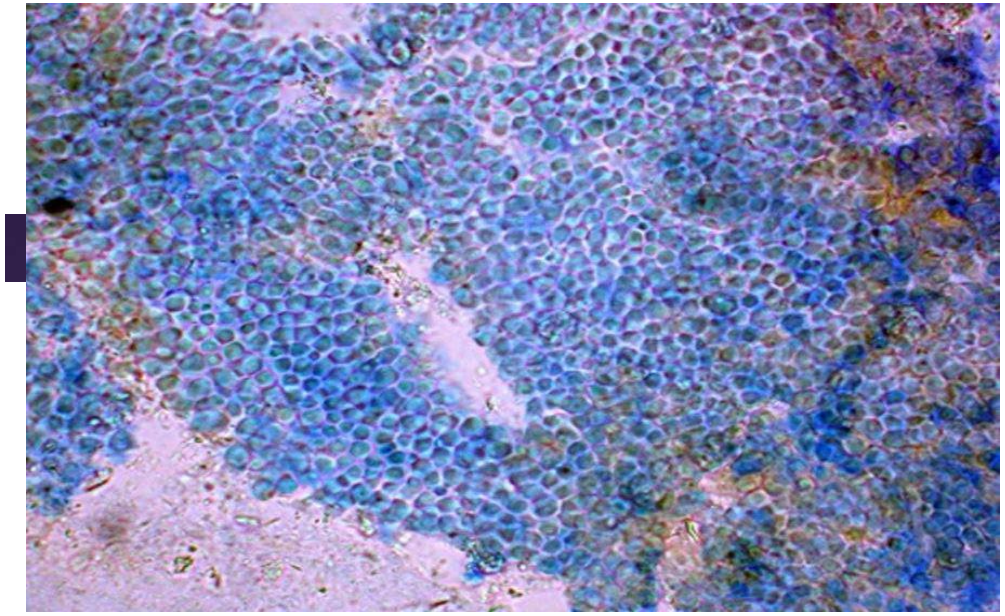
1.Clinical material:

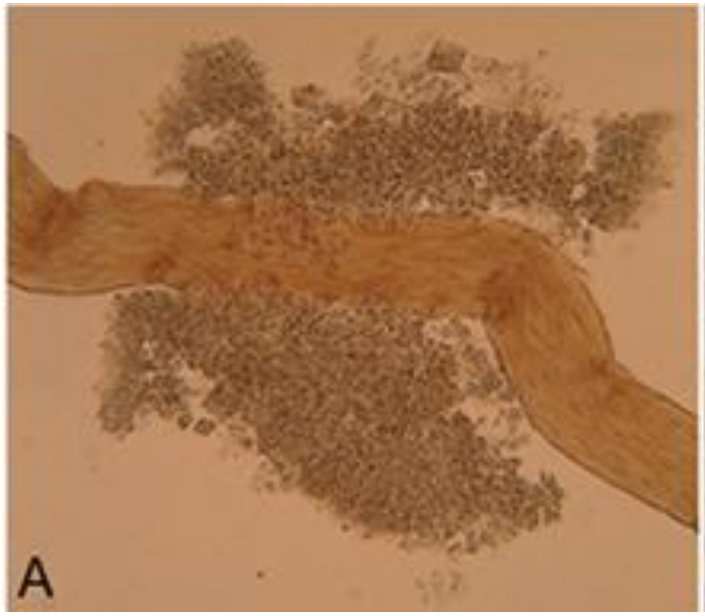
Epilated hairs with white soft nodules present on the shaft.

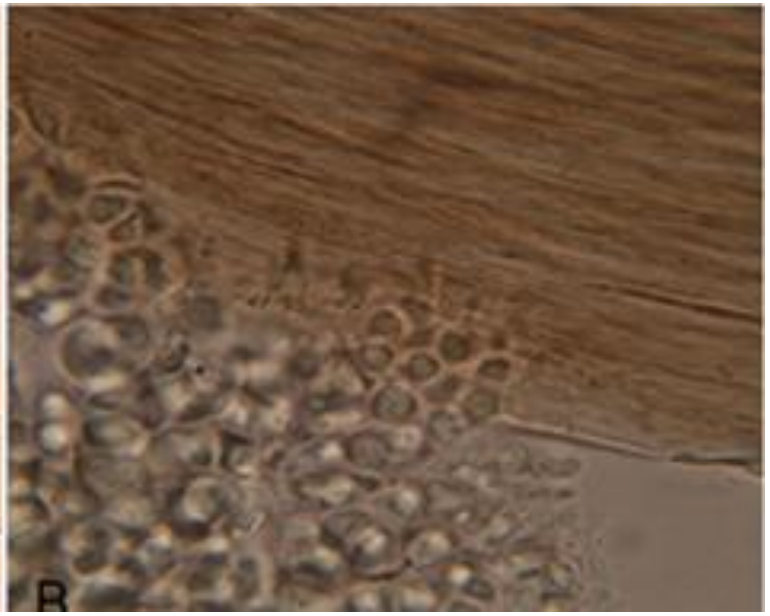
2. Direct Microscopy:

Hairs should be examined using 10% KOH and Parker ink or calcofluor white mounts.

Examine specimens for **yeast cells of *Trichosporon* spp**







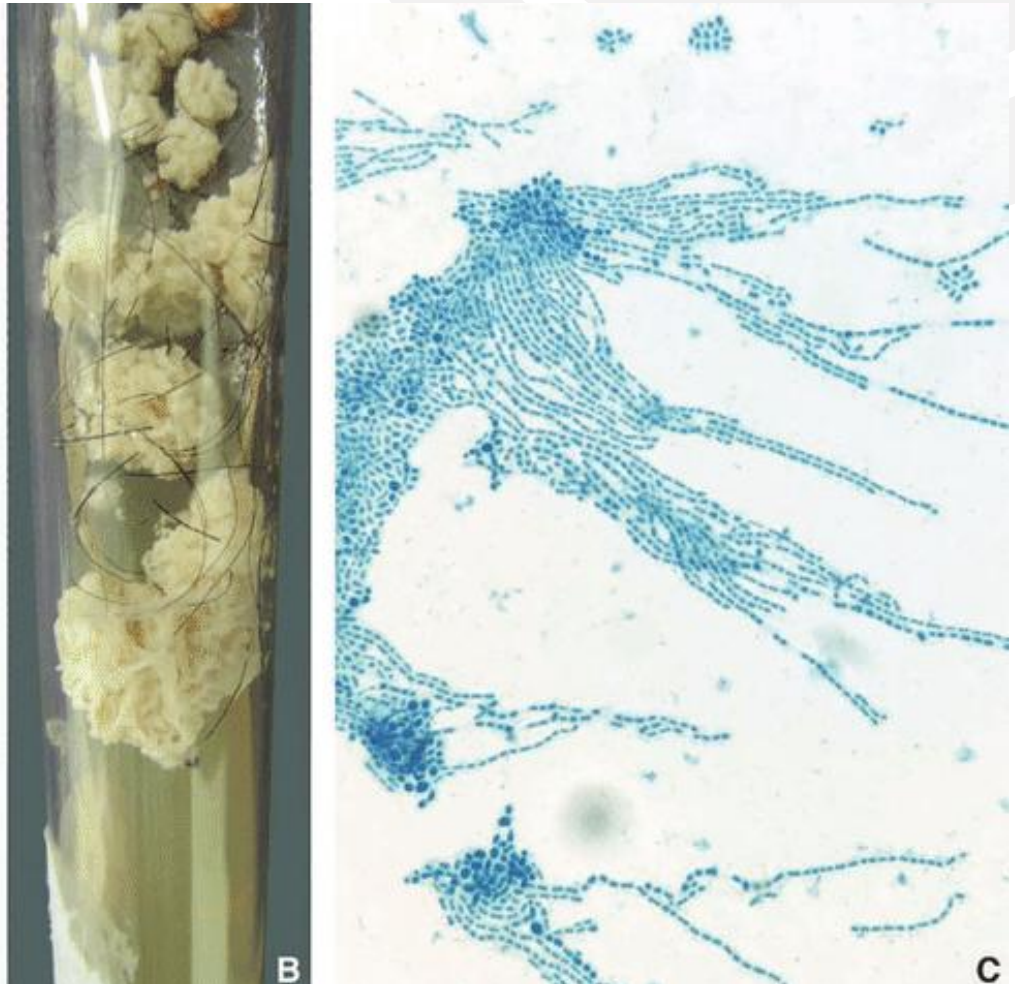
3. Culture:

Hair fragments should be implanted onto Sabouraud's dextrose agar.
Colonies of *Trichosporon* spp. are **white or yellowish to deep cream colored, smooth, wrinkled**.

Treatment:

Shaving the hair is the simplest method of treatment.

Topical application of an **imidazole** agent may be used to prevent reinfection.



Black piedra

- Caused by *Piedra hortae*, an ascomycetous fungus forming hard black nodules on the hair shafts of the scalp, beard, and mustache.
- It is common in Central America and Southeast Asia.
- Infection can be spread through the use of contaminated objects such as:

✓Combs

✓Hairbrushes

✓Hair washing tools

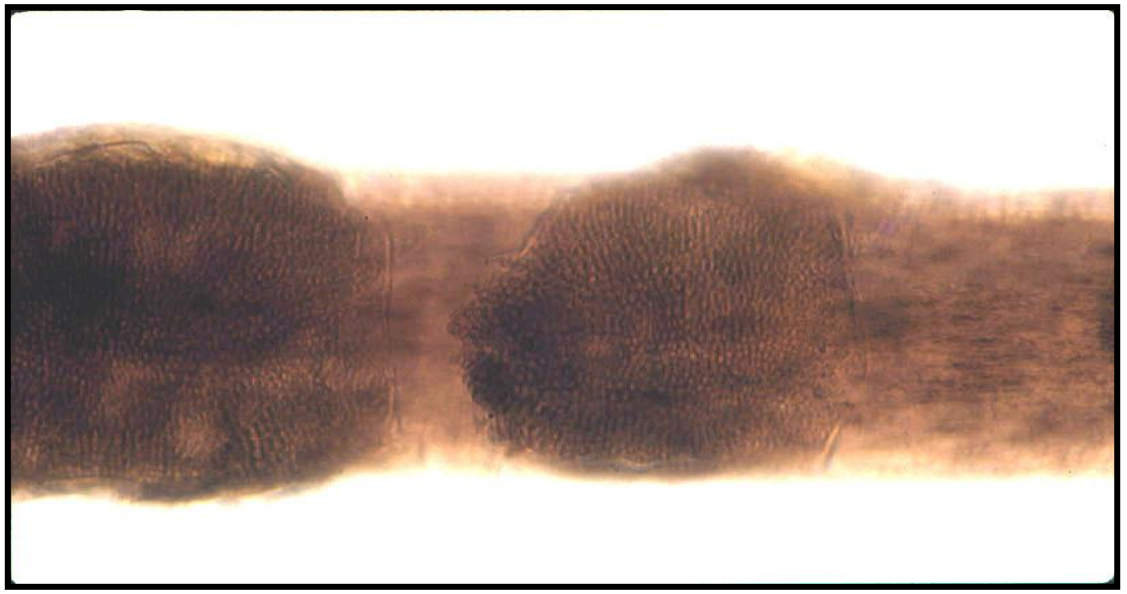
1.Clinical material:

Epilated hairs with hard black nodules present on the shaft.

2. Direct Microscopy:

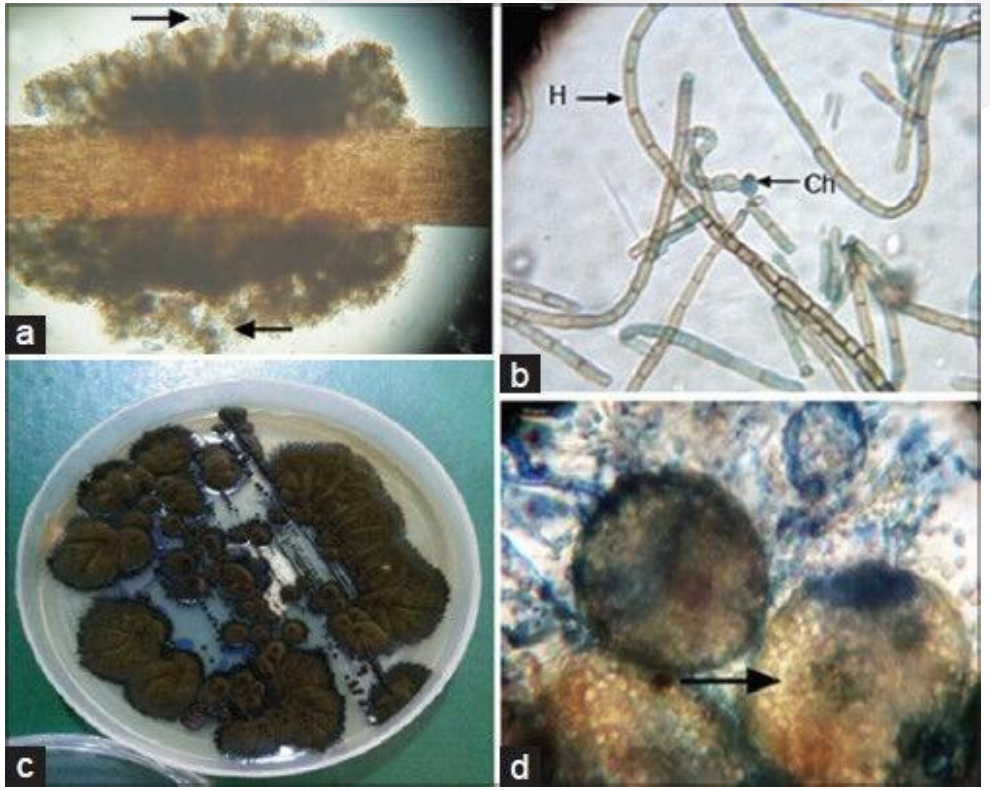
Hairs should be examined using 10% KOH.

Examine specimens for **Pigmented Hyphae, asci, and ascospores**



3. Culture:

Hair fragments should be implanted onto Sabouraud's dextrose agar.
Colonies of *Piedra hortae* are **dark, brown-black,** and take about 2-3 weeks to appear.



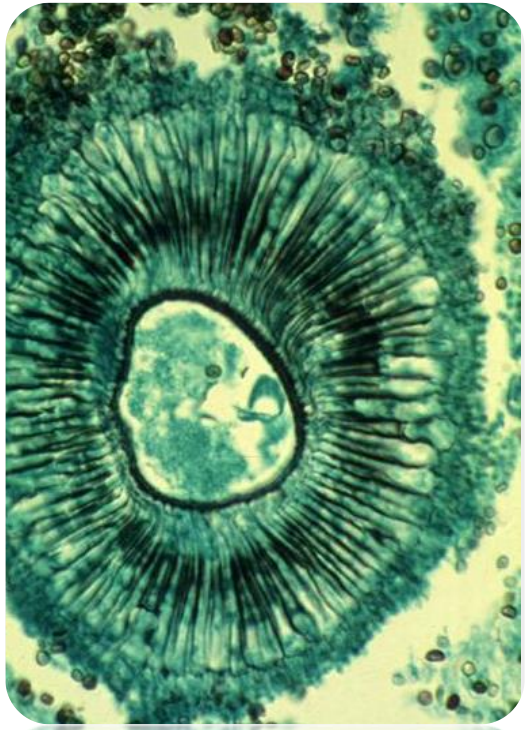
Treatment:

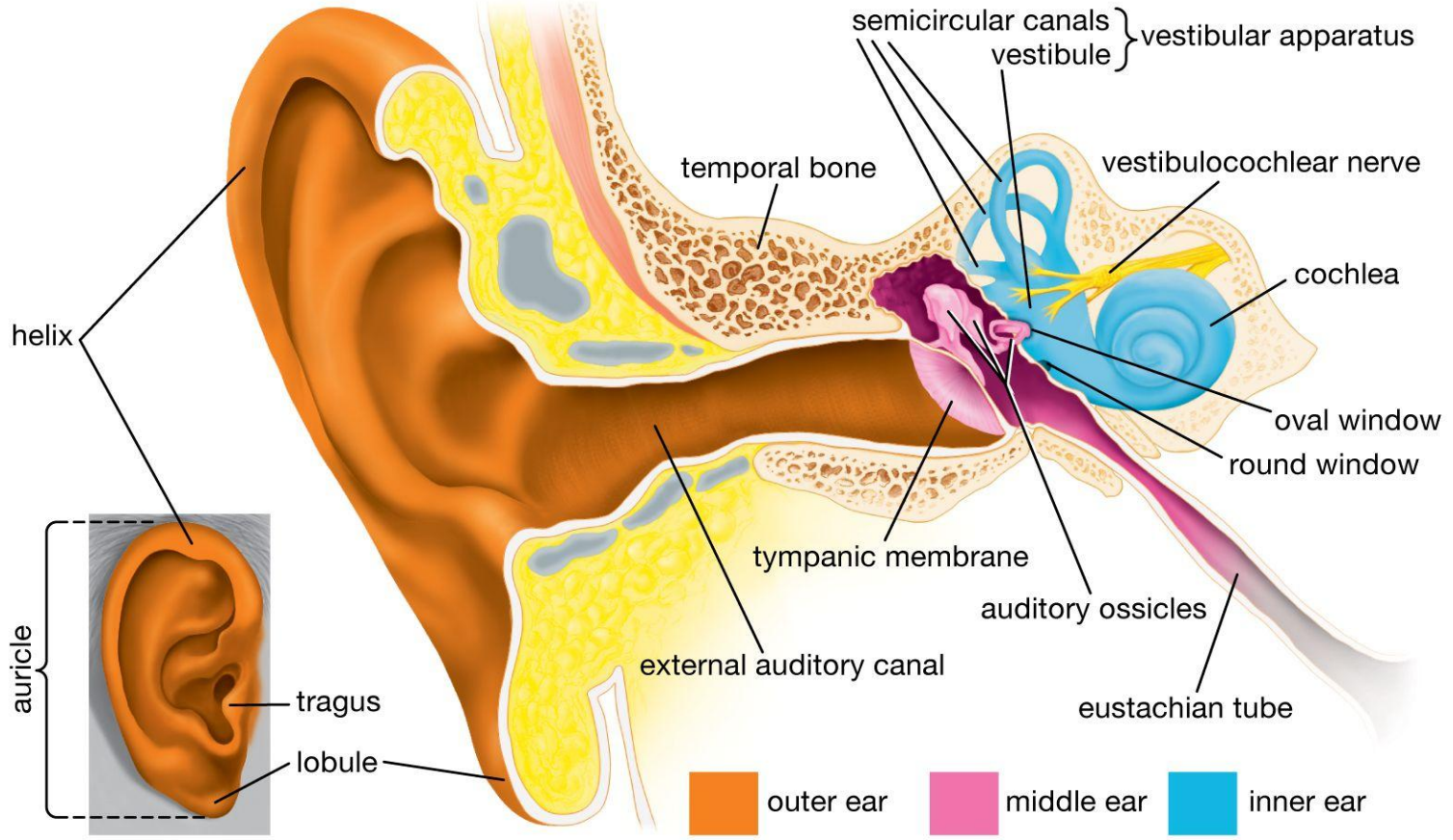
Shaving the hair is the simplest method of treatment.

applying antifungal shampoos like ketoconazole or miconazole.

Otomycosis

- The term otomycosis is mostly used to describe fungal infections of the external ear (auricle, auditory canal, eardrum). Its complications sometimes involve the middle ear.





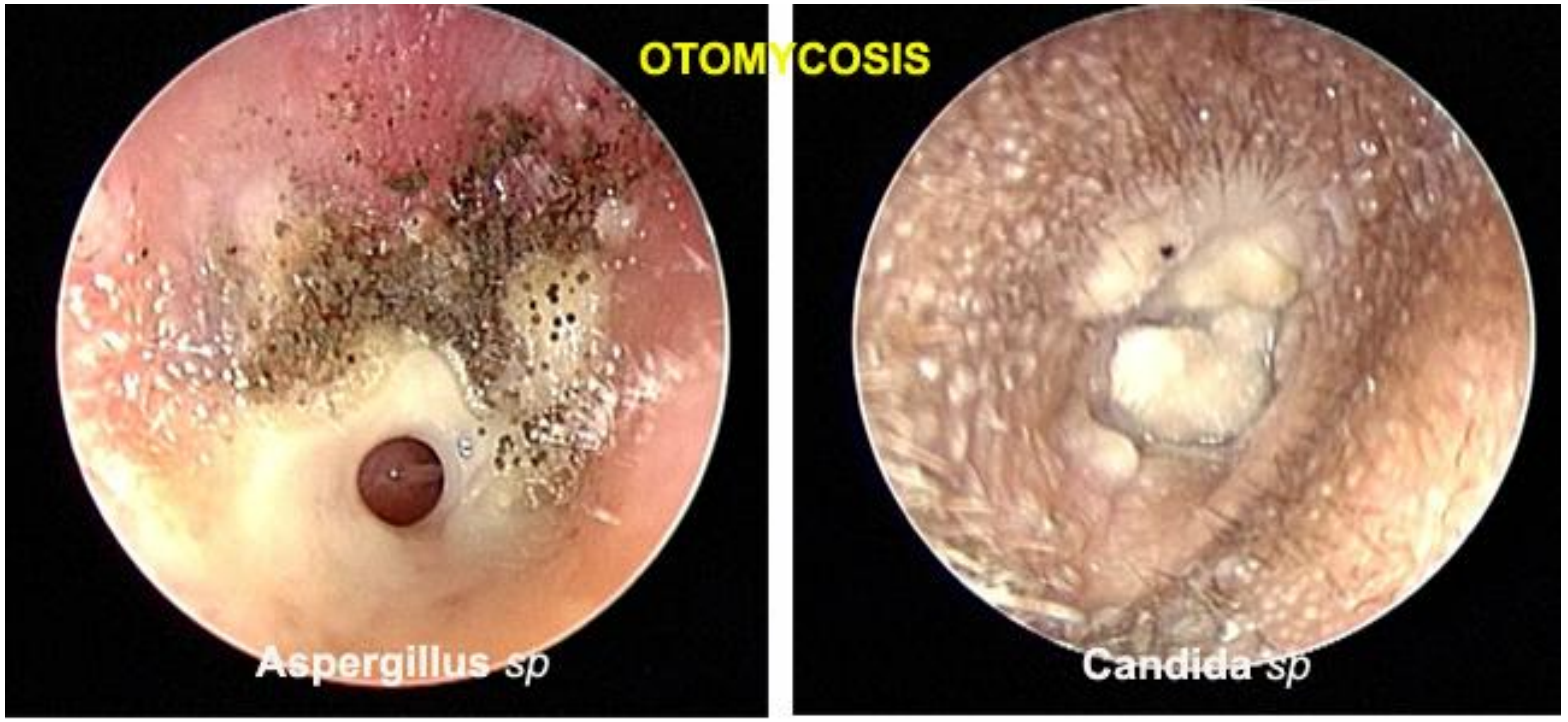
Symptoms

- ❑Pain
- ❑Itching
- ❑Swelling
- ❑Redness
- ❑Inflammation
- ❑Ringing in the ears
- ❑Feeling of fullness
- ❑Discharge of fluid
- ❑Hearing problems

Discharge from the ears is one of the most common symptoms and may be of different colors. You may see white, yellow, black, gray, or green fluid.

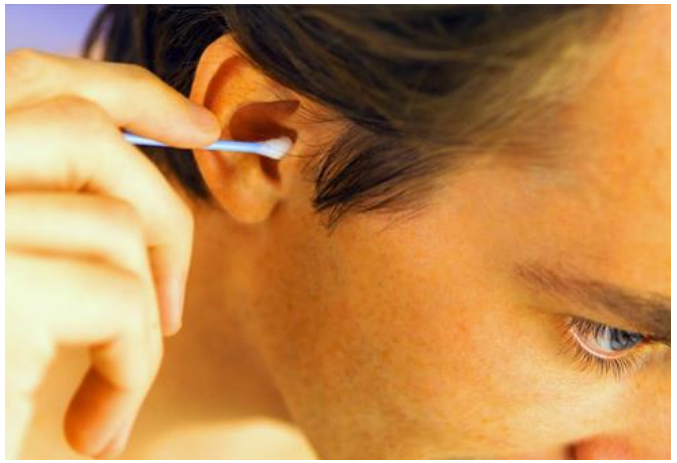
Etiology

- Molds
- Yeasts
- Dermatophytes (occasionally)
- ***Aspergillus niger*** and ***Candida albicans*** are the most common causative agents of otomycosis



Risk Factor

- Cerumen
- Humid climate
- Swimming
- Instruction of the ear
- Use of ear drops
- Allergy to topical agents
- Contact dermatitis
- Steroids (local & Systemic)
- Bacterial infections
- Abnormal anatomy of the external auditory canal
- Fungal infection elsewhere in the body
- Low socioeconomic condition



Diagnosis

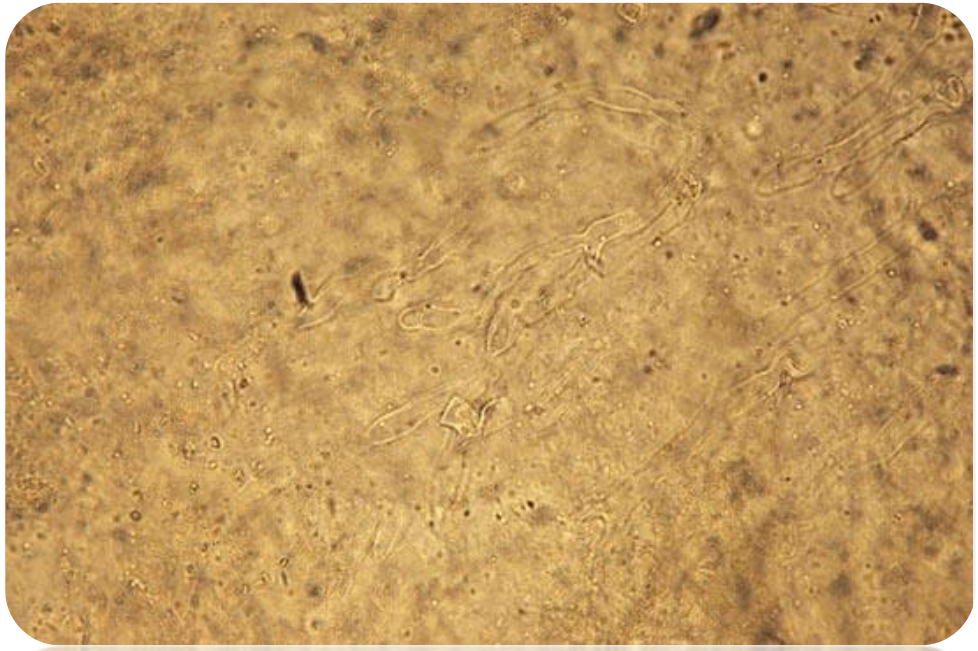
1.Clinical material:

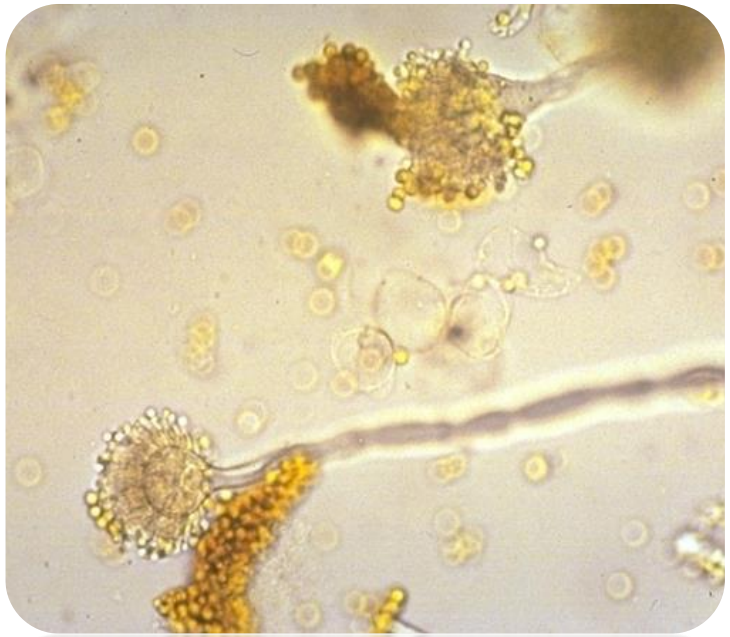
Scraping, debris, and secretions. Biopsy and surgical material.

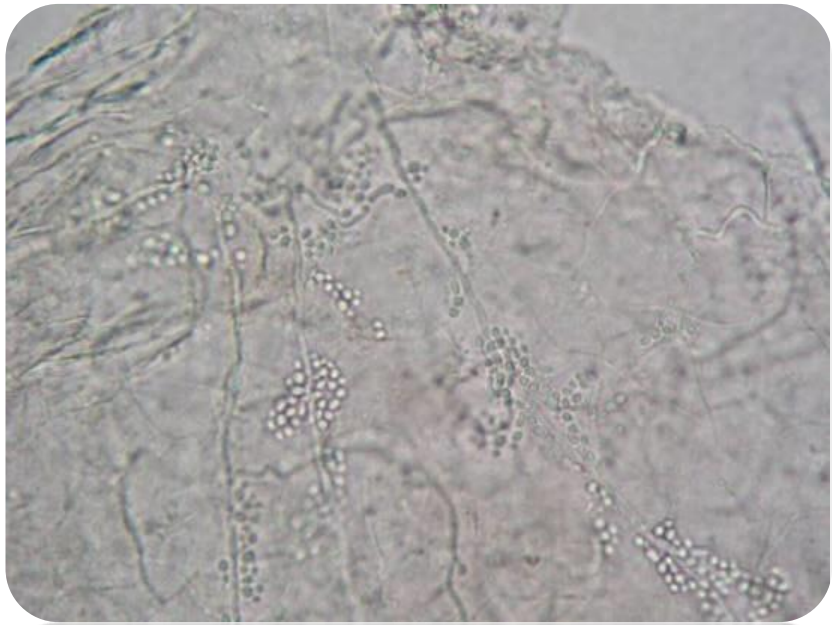
2. Direct Microscopy:

Using 10% KOH or common stains (Methylene blue, Giemsa).

Examine specimens for **Mold hyphae** **(occasionally with fruiting heads of *Aspergillus*),** **Pseudohyphae, or yeast cells**

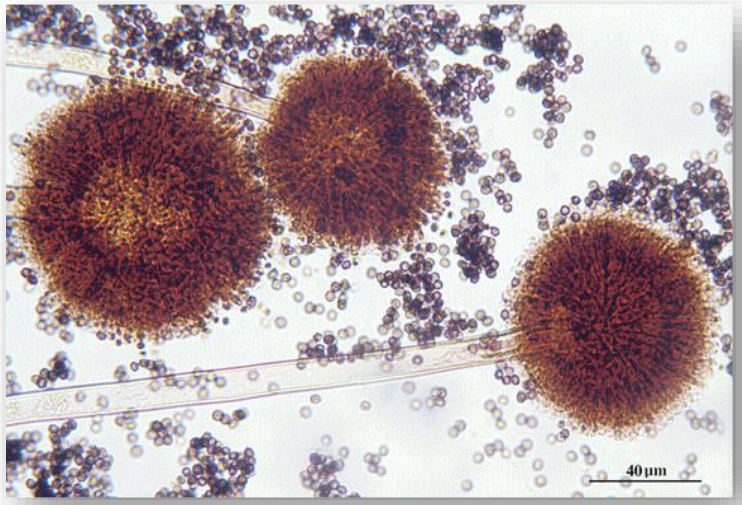






3. Culture:

Specimen inoculated on S, SC, SCC, and BA media and incubated at 25 °C and 37 °C for 14 days, the cultures should be examined every 3-4 days.



Treatment

- Patients with superficial infections and chronic colonization should be treated by intense debridement, cleaning, and topical antifungal drugs such as clotrimazole, miconazole, bifonazole, ciclopiroxolamine, and tolnaftate.

- Invasive forms of otomycosis will be lethal if not treated. Itraconazole, voriconazole, and posaconazole have good efficacy against *Candida* and *Aspergillus.*

Erythrasma

- Erythrasma is an **intertriginous infection** with *Corynebacterium minutissimum* that is most common among patients with diabetes and among people living in warmer climates.
- Up to 50% of the normal flora of the skin

Even though erythrasma and trichomycosis are bacterial infections, why have they been classified among Superficial mycoses?

1. Both infections cause a similar status to fungal infections in the same sites.

2. Etiologic agents are branching filamentous organisms, just like fungi

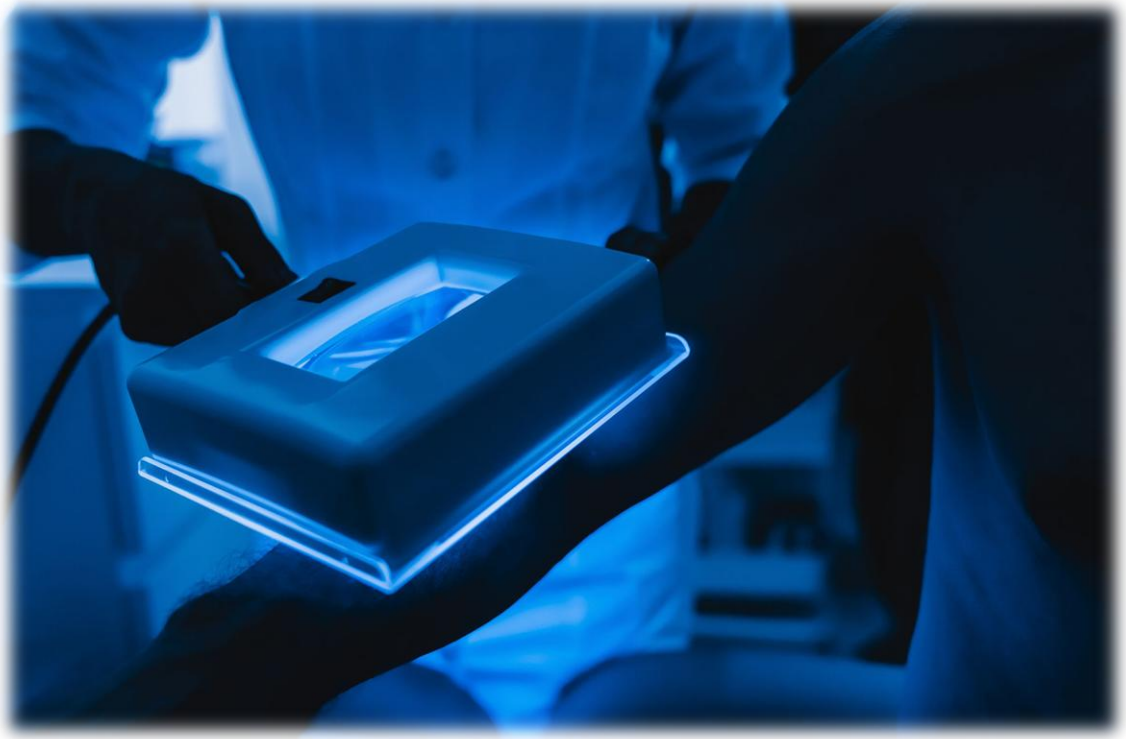
Risk Factor

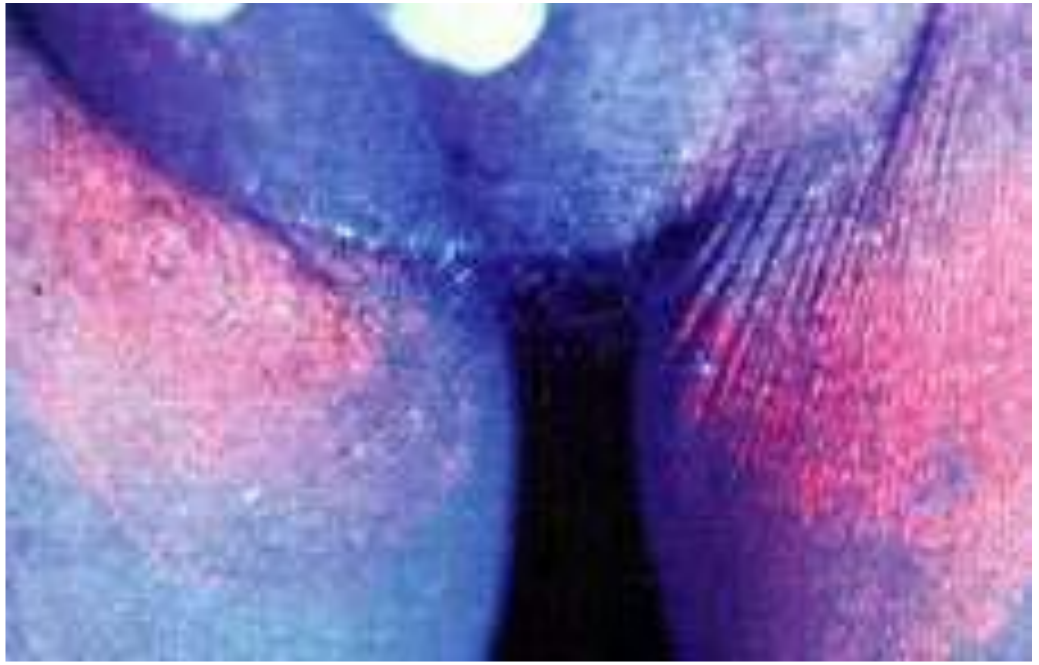
- Excessive Sweating / hyperhydrosis
- Delicate Cutaneous barrier
- Obesity
- Diabetes mellitus
- Warm climate
- Poor hygiene
- Advanced age
- Other immunocompromised states

Clinical manifestation

- Red-brownish, slightly scaly macular patches with sharp borders in intertriginous areas of the skin
- Patches may itch slightly.
- Lichenification and hyperpigmentation are common.
- The signs in the toe web spaces, as the most common interdigital infection of the foot, include:
  - ✓ Fissuring
  - ✓ Scaling

Wood's Lamp



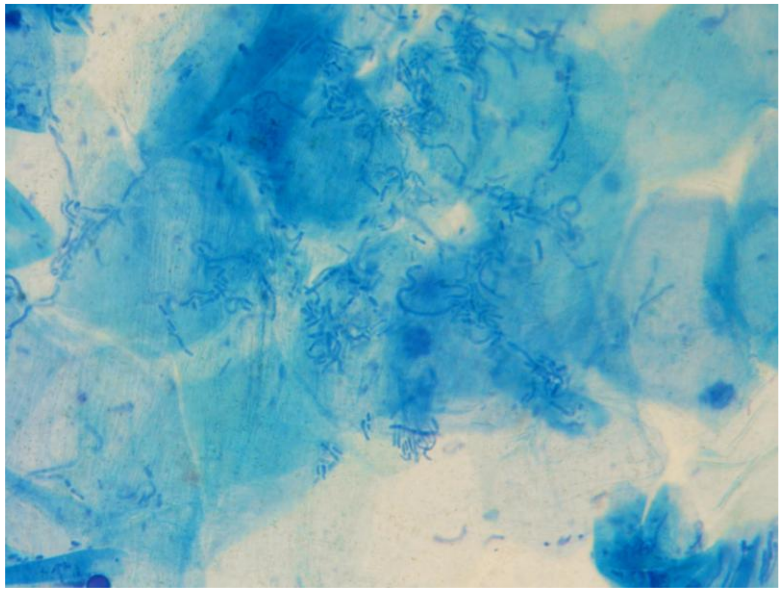


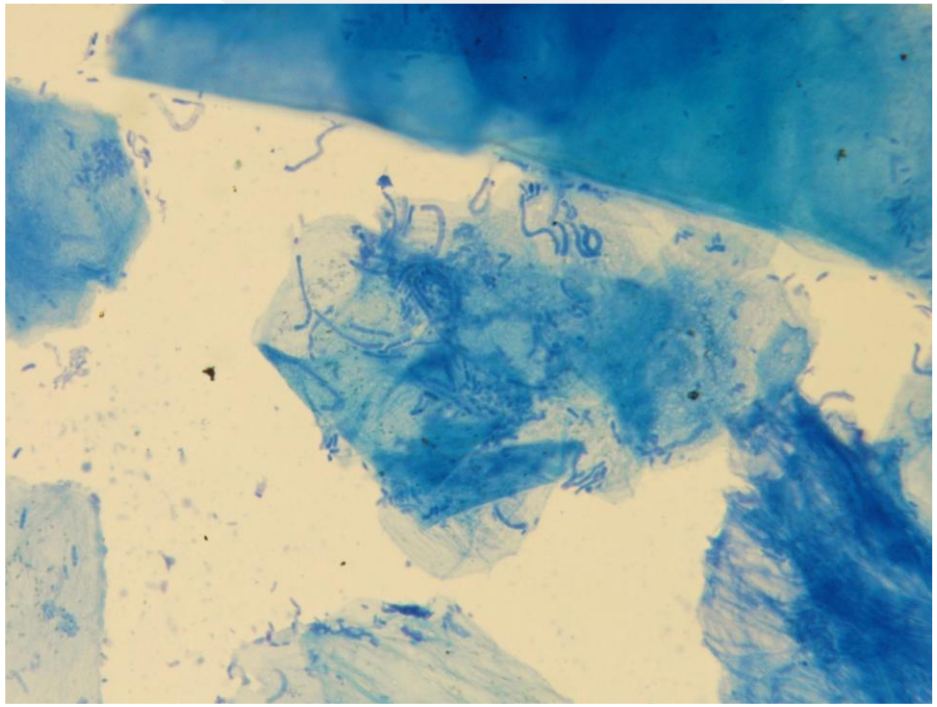
Wood light examination reveals **coral-red** fluorescence

1.Clinical material:
scrapping scales of lesions

2. Direct Microscopy:
Using 10% KOH or common stains (Methylene blue, Giemsa).
Examine specimens for **branching filamentous bacteria along with small coccoid forms**

3. Culture:
Culture is typically not recommended for diagnosis.





Treatment

- Erythromycin 250 mg four times daily for 14 days (choice)
- Generally, creams are not ideal for use in skin folds and interdigital spaces.
- Relapse may occur, so the areas should be kept clean and dry.

Trichomycosis Axillaris

- A superficial infection of the axillary or pubic hair, characterized by the formation of yellow (flava), red (rubra), or black (nigra) nodules or Cylindrical sheaths around the hair shaft.
- *Corynebacterium tenuis*
- It is colonized on the hair shafts in sweat gland-bearing areas such as the armpits and the pubic area.

1.Clinical material:
clipped hair

2. Direct Microscopy:
Using 10% KOH or common stains (Methylene blue, Giemsa).
Examine specimens for **Observation of cylindrical or granular sheaths around the hair shafts (yellow, black or red)**

3. Culture:
Culture is typically not recommended for diagnosis.

Treatment:

Shaving the hair is the simplest method of treatment.

- Using topical erythromycin or clindamycin
- Drying powders may assist treatment
- Use of antiperspirants helps in prevention

THANK YOU