Mycosis :

is a fungal infection of animals, including humans. Mycoses are common and a variety of environmental and physiological conditions can contribute to the development of fungal diseases. Inhalation of fungal spores or localized colonization of the skin may initiate persistent infections; therefore, mycoses often start in the lungs or on the skin

Fungal infections of the skin was the 4th most common disease in 2010 affecting 984 million people .An estimation of 1.6 million people die each year of fungal infections.

Classification:

Mycoses are classified according to the tissue levels initially colonized.

A- Superficial mycoses

These are superficial fungal infections of the skin, hair or nails. No living tissue is invaded, however a variety of pathological changes occur in the host because of the presence of the infectious agent and its metabolic products.

Types of Superficial mycoses :

1- **Malassezia** species are basidiomycetes yeasts and form part of the normal skin flora of humans and animals. The genus now includes 14 species of which 13 are lipid dependent.

M. sympodialis ، *M. globosa*، *M. slooffiae* ، *M. restricta* and *M.* furfur are the most frequently found species responsible for colonization of humans .

Malassezia species may cause different skin manifestations including pityriasis versicolor, seborrhoeic dermatitis, dandruff, atopic eczema and folliculitis.

Note:

With the exception of *M. pachydermatis*, the primary isolation and culture of Malassezia species is challenging because in vitro growth must be stimulated by natural oils or other fatty substances. The most common method used is to overlay Sabouraud's dextrose agar (SDA) containing cycloheximide with olive oil or alternatively to use a more specialised media like modified Leeming and Notham agar or modified Dixon's agar .

Laboratory Diagnosis:

a- Direct Microscopy:

Skin scrapings taken from patients with Pityriasis versicolor stain rapidly when mounted in 10% KOH, glycerol and Parker ink solution and show characteristic clusters of thick-walled round, budding yeast-like cells and short angular hyphal forms up to 8um in diameter . These microscopic features are diagnostic for Malassezia furfur and culture preparations are usually not necessary.

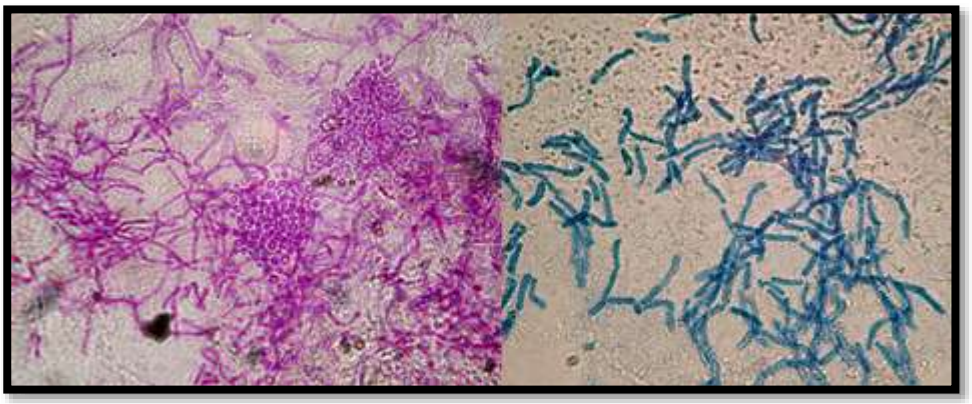

Figure (1) 10% KOH with Parker ink mount showing characteristic spherical yeast cells and short pseudohyphal elements typical of the fungus

b- Culture:

Culture is only necessary in cases of suspected . M. furfur is a lipophilic yeast, therefore in vitro growth must be stimulated by natural oils or other fatty substances. The most common method used is to overlay Sabouraud's dextrose agar containing cycloheximide with olive oil or alternatively to use a more specialized media like Dixon's agar which contains glycerol .

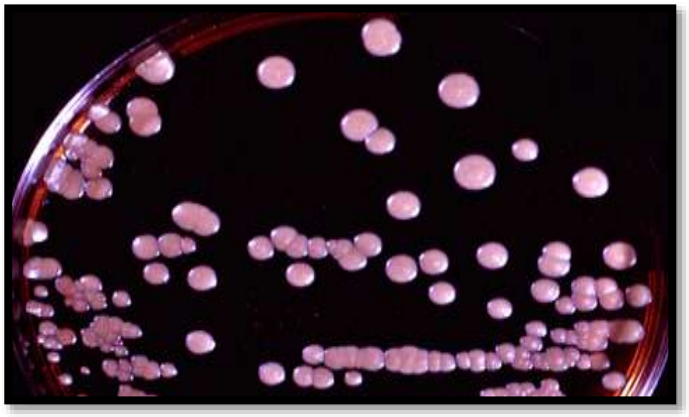

Figure (2) Culture of *M. furfur* on Dixon′s agar

2- *Tinea nigra*

A superficial fungal infection of skin characterised by brown to black which usually occur on the palmar aspects of hands and occasionally the plantar and other surfaces of the skin , Lesions are non-inflammatory . Familial spread of infection has also been reported. World-wide distribution, but more common in tropical regions of Central and South America, Africa, South-East Asia and Australia. The aetiological agent is *Hortaea werneckii* a common saprophytic fungus believed to occur in soil, compost, humus and on wood in humid tropical and sub-tropical regions.

Figure(3) Typical brown to black, on the palmar aspect of the hands. **Note:** there is no inflammatory reaction.

Laboratory Diagnosis:

a- Direct Microscopy:

Skin scrapings should be examined using 10% KOH and Parker ink .

Figure (4) Colony and conidia of *Hortaea werneckii*

b- Culture:

Clinical specimens should be inoculated onto primary isolation media, like Sabouraud's dextrose agar.

3- **Black piedra**

Black piedra is a superficial fungal infection of the hair shaft caused by *Piedra hortae*, an ascomycetous fungus forming hard black nodules on the shafts of the scalp, beard, moustache and pubic hair. It is common in Central and South America and South-East Asia.

Laboratory Diagnosis:

a- Direct Microscopy:

Hairs should be examined using 10% KOH and Parker ink or calcofluor white. Look for darkly pigmented nodules that may partially or completely surround the hair shaft. Nodules are made up of a mass of pigmented with a stroma-like centre containing asci.

b- Culture:

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

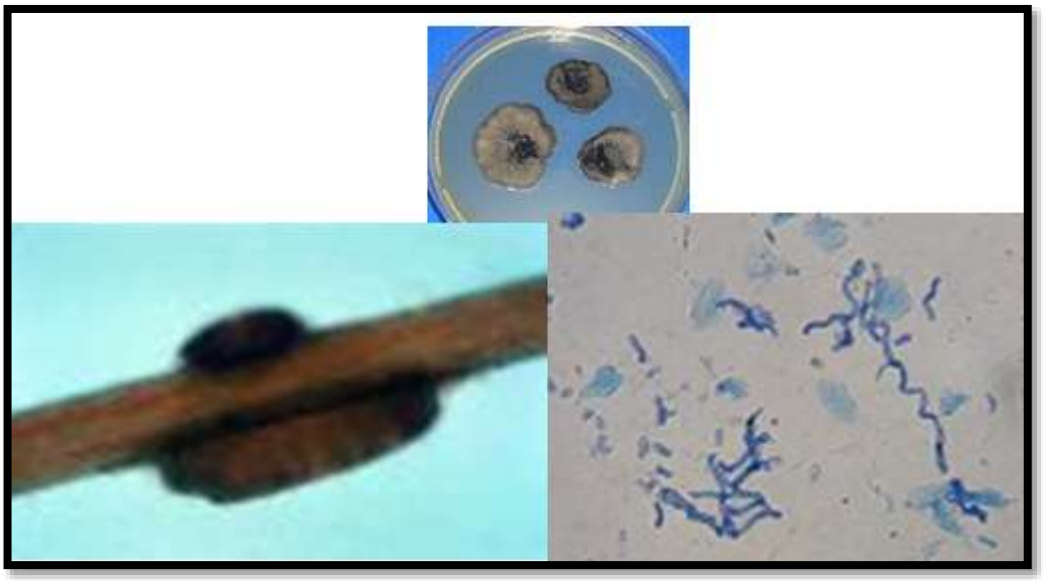

Figure (5) *Piedra hortae*