

B. Dimorphic fungi: -

The fungi can exist in the form of both mold and yeast. At 37°C they exhibit yeast like growth and at 20°C they exhibit Mycelial growth (Mould).

In **parasitic phase** (During infection in animal and human) they grow like **yeast** and multiply by budding process, whereas in **artificial media**, they produce **mycelial** colonies (mould)

1. *Histoplasma*
2. *Blastomyces*
3. *Paracoccidioides*
4. *Coccidioides*
5. *Sporotrichum*

1. Histoplasmosis:

There are 2 important species

1. *Histoplasma capsulatum* var *capsulatum*:

Disease: Histoplasmosis/Darling disease/Ohio valley disease/cave disease

- It causes fetal granulomatous infection of lung and lymphatic system in **man, cat and dogs**. The infection of *H. capsulatum* occurs by inhalation of conidia, although ingestion of spore may also result into infection
- The lesions are primarily occurred in respiratory system and in intestine. The granulomatous and ulcerative lesions like T. B. also observe in many organs.

In dog:

Chronic cough

Persistent or intermittent diarrhoea

Pyrexia, gradual weight loss

“Ascitis”- Common manifestation of disease

2. *Histoplasma capsulatum* var *farcinosum*:

Disease: Epizootic lymphangitis/pseudoglander/Japanese farcy in equine

- In chronic infection granulomatous and suppurative ulcer on skin and inflammation of lymph glands and lymphnode can be observed.

Habitat

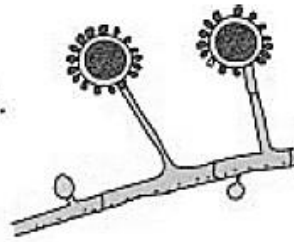
- Heavily concentrated in the feces of birds
- Soil in bat caves, bird roosts, chicken houses

Morphology

- Facultative, **intracellular parasites of macrophages**
- Small, oval yeast cells with or without buds
- Daughter cells are attached to mother cells by a narrow attachment point
- Yeast cells are relatively small
- Clear halo is seen around darker-staining central material.

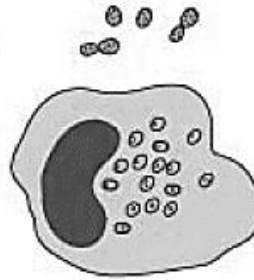
Mould form

Septate hypha bearing small conidia. Later, sunflower-like macroconidia (9-15 μm in diameter) form when cultured at 25°C



Yeast form

Small oval budding yeast cells (2-5 μm in diameter) in cultures at 37°C. Found also in tissues



Yeast cells in a macrophage

Cultural characteristics:

- On SDA agar with chloramphenicol and cyclohexamide incubate
 - At 25°C – Mycelium like growth
 - At 37°C – Yeast like growth
- It requires 1 to 2 weeks for development of colonies. The arial hyphae is first white and fluffy and it covers medium within short period of time. After long incubation it produces brown colour.

Diagnosis:

- Based on clinical sign
- Based on **blood smear** examination from dog in systemic infection- stain blood smear with Giemsa stain- observe “**Hist cell**” in **mononuclear cell**.
- Based on cultural characteristics on SDA agar
- Histopathological identification from liver “Hist cell” in macrophages
- CFT
- **Intradermal histoplasmin test:** In dog for canine histoplasmosis

2. Blastomycosis:

Species: *Blastomyces dermatitidis*

Disease: 1. North american blastomycosis - **Horse**

- North American blastomycosis is characterized by formation of suppurative and granulomatous lesions in any part of the body
- Fungus multiply in lungs, skin and bones

2. Canine blastomycosis - **Canine**

- Highly fatal disease associated with pulmonary lesions
- Chest cavity is filled with nodules and lungs are highly congested
- Abscess on anus and vulva-characteristic lesion found for long time

3. Mastitis - **Cattle**

Habitat:

- Acid soil rich in organic matter

Cultural character and Diagnosis are same as Histoplasmosis

3. Paracoccidioides

Paracoccidioides brasiliensis: South American blastomycosis

4. Coccidioides:-

Species: *Coccidioides immitis*

Disease: **Canine coccidioidomycosis**
Equine coccidioidomycosis

Habitat:

- Saprophyte in arid/desert soils

Morphology:

Large spherules containing endospores demonstrable in infected tissues

The infection is acute, benign and self-limiting disease of pulmonary system

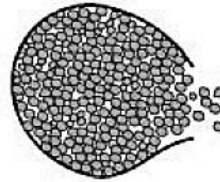
Mould form

Septate hyphae with barrel-shaped arthrospores (2-4 x 5-6 µm) separated by empty cells are formed in soil and cultures



Spherule

Mature spherules (30-100 µm) containing endospores are found in tissues



Diagnosis:

- Isolation of fungi on SDA agar and littman oxgall agar
- Hypersensitivity test: Coccidodin skin test: 0.1 ml extract of fungi (Coccidodin) given intradermally which produces erythromatous lesion at site of injection.

5. Sporotrichosis:

- A yeast-like fungus present on vegetation, particularly on the thorns of roses and on plants that carry sharp spicules, or needlelike projections.
- A draining sore develops at the site of a puncture wound. This usually occurs on the leg but sometimes on the upper body. Nodules appear beneath the skin along the course of lymphatics. The nodules ulcerate, discharge pus, crust over, and heal slowly.

Species: *Sporothrix schenckii*

Disease: **Equine sporotrichosis**
 Feline sporotrichosis
 Canine sporotrichosis

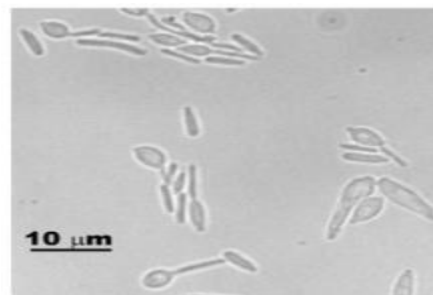
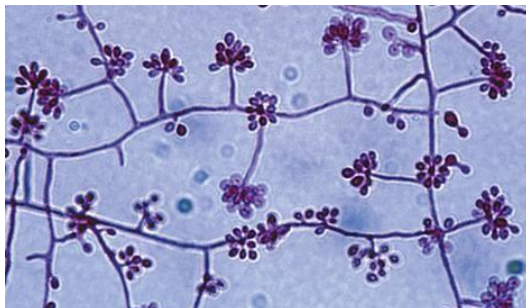
It causes non-contagious granulomatous infection of skin and lymphatics in man and animals.

Habitat:

Fungus is saprophytes on dead or old vegetation such as rose thorns, timber, hay, straw etc.

Morphology:

- Pear shaped conidia are borne in **rosette pattern** on slender conidiophores. Conidia occur singly along the hyphae.
- In yeast form (37°C) forms **Cigar-shaped**, pleomorphic budding yeast cell



Cultural character:

- When cultured on SDA at 25°C, mould colonies grow rapidly and are **white, becoming black or brown, wrinkled and leathery.**
- On Brain heart infusion agar containing 5% blood produces cream to tan yeast colonies are observed and yeast cells are **Cigar shaped**

