Division 2: Eumycota

Subdivision 2: Deutrromycotina:

Are known as **imperfect fungi** which characterized by:

1. They have septate hyphae.
2. Reproduce only by **conidia**.
3. The majority are either saprobes or parasites of plants. A few are parasitic on other fungi and some even trap and consume nematodes.
4. Some are used in commercial production of certain chemicals including some antibiotics.

The bases used in the classification of imperfect fungi:

1. Presence or absence of conidia
2. Shape, color and form of conidia
3. Type of asexual fruiting structures

Class 1: Hyphomycetes

Mycelium is sterile, or produce conidia bearing on conidiophores, these conidiophores arise either directly on mycelium or formed in the inside special structures called **(sporodochium or synnema).**

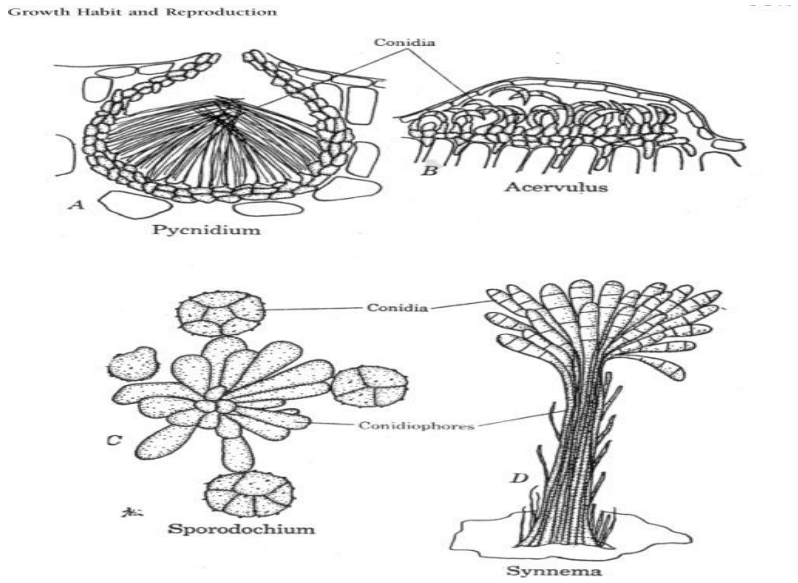
Order 1: Moniliales:

It is a very large group of probably over 7000 species. The conidia either bearing on free and separated conidiophore (sporodochium) or collected conidiophores (synnemata). This order involves **three** families:

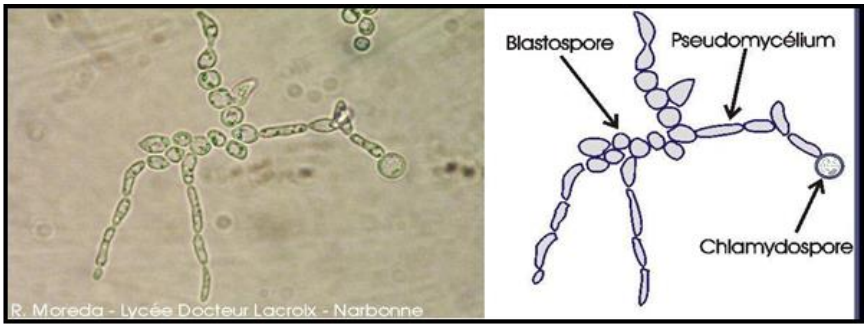
Family 1: Moniliaceae

It is the larger family which involves the fungi which their conidia bearing on conidiophore (colorless) and colorless hyphae such as *Verticillium,* and *Botrytis*. The conidia of the later genus are in cluster like grape clusters.

Genus 1: *Candida*: Cells are collected to form pseudomycelium which bearing arthrospores.



Types of asexual fruiting bodies in Deuteromycotina



Candida albicans

Family 2: Dematiaceae: It is characterized by dark-color or black conidia, conidiophore, and mycelium. Most of them are saprobes such as:

Genus 1: *Alternaria*: Bottle-shaped conidia and divided by longitudinal Septa.

Genus 2: *Helmenthosporium*: All produce rather large phragmospores, multicellular conidia possessing transverse septa (2,3 or 4) septa.

Genus 3: *Cladosporium*: All produce two types of conidia, the first is bicellular conidium and the second is unicellular small conidium, dark- green to black in color.

Alternaria

Helmenthosporium

Cladosporium

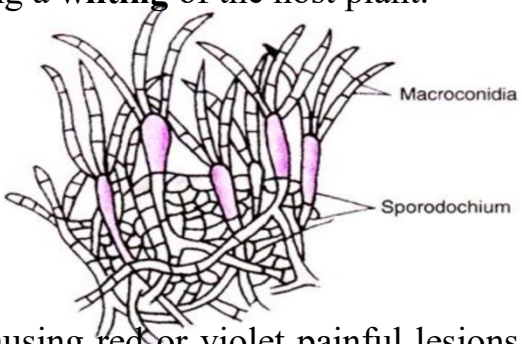
Conidia of some common form-genera of Moniliales

Family 3: Tuberculariaceae

The asexual fruiting bodies are bearing within a sporodochium.

Genus: *Fusarium*:

Fusarium produces two types of conidia that are termed **macroconidia** and **microconidia**. Both types are produced from **phialides**. Macroconidia are long, multiseptated, crescent or canoe-shaped structures that are generally born in sporodochia. Microconidia are small, one-celled, spherically or ovally shaped. Several *Fusarium* are parasites, generally causing a **wilting** of the host plant.



Sporodochium of *Fusarium*

Human diseases caused by *Fusarium*:

1. **Cutaneous Fusariosis**: Skin infection causing red or violet painful lesions, mainly in immunocompromised individuals.
2. **Keratitis**: Corneal infection often related to contact lens use or eye trauma, leading to eye pain, redness, and potential vision loss.
3. **Onychomycosis**: Nail infection causing discoloration, thickening, and nail deformity.

4. **Invasive Fusariosis**: Severe infection that spreads to the bloodstream and internal organs, often life-threatening for immunocompromised patients.
5. **Mycotoxicosis**: Illness from ingestion of Fusarium-produced toxins in contaminated food, causing gastrointestinal and hormonal issues.

Order 2: Agonomycetalas (Myceliasterile)

There are **no conidia**, **conidiophores,** or **reproductive organs**. There are a few families and genera in this order.

Genus: Rhizoctonia

It is commercially important. It is saprophyte in soil causing **damping off seedling**. It is distinguished by mycelium which form right angle when branched. The branches are narrow in branching regions and more thickness.

Class 2: Coelomycetes

Mycelium produce conidia bearing on conidiophores, these conidiophores arise either directly on mycelium or formed in the inside special structures called **(Acervulus or Pycnidium).**

Order 1: Sphaeropsidales

The distinctive structure of Spaeropsidales is of course **the pycnidium**.

Family1: Sphaeropsidaceae **Ex: *Septoria apii***

The asexual fruiting bodies are pycnidium which causes **late blight disease on celery**. The genera are characterized by small, ostiolate pycnidia sunken in the substratum, very short phialides and hyaline or greenish, long conidia (needle-shaped conidia).

Order 2: Melanconiales

Asexual fruiting bodies are **acervuli**.

Family: Melanconiaceae **Genus: *Colletotrichum***

The form-genus Colletotrichum produces typically elongated, hyaline conidia with round ends. Dark setae are often found in the acervulus. This genus causes Bean anthracnose.