

Sub-division: Deuteromycotina

- Fungi in this group are also called ‘fungi imperfecti’ because they lack the sexual stage.
- They exist in the anamorphic/asexual state.
- Once the teleomorphic/sexual state is known, the organism ceases to be grouped as deuteromycotina.
- Such an organism is either placed in ascomycotina or Basidiomycotina.
- In such a situation the organism is neither placed in mastigomycotina nor zygomycotina. They reproduce by conidia.

Types of conidium

- A **conidium** (pl. conidia) is an exogenously produced asexual spore.
- The conidia are non-motile and are borne externally or vertically on conidiophores.
- The conidiophores are simple or branched hyphae with special regions of conidia formation.
- The conidia are usually produced on the apical region of the conidiophores as a single conidium or a chain of conidia.
- The development of conidia can be one of two ways which are blastic or thallic

Types of conidium(contd)

- There are basically two types of conidia namely:
- **Thallospores:** These are conidia formed by the transformation of existing cells of the thallus. They are released by the breakdown of the thallus and are terminal or intercalary in position. Thallospores can either be arthrospore or chlamydospores.
- **Conidiophores:** These are asexual spores formed singly or in chains on the conidiophores. These spores are formed in basipetal or acropetal succession on either free conidiophore or their aggregation in the form of fructification.
- There are four types of conidiospores. These are aleuriospore or gangliosporangium, blastospore, porospore and phialospore.

Classification of deuteromycotina

- This sub-division comprises of a large number of fungi with various fruiting structures.
- Fungi are group into various classes based on the type of conidia they produce.
- The life cycle of fungi here is incomplete because they only reproduce by conidia which are asexual spores.
- They are mostly parasitic with about 90% of them causing plant diseases.

Classification of deuteromycotina (contd)

An organism maybe classified under deuteromycotina if:

- It does not produce a sexual state which could be that
- The conditions which are appropriate for the production of a teleomorphic state have not been identified.
- The organism has lost the ability to reproduce sexually.
- The sexual state of the organism has not been found.
- Mycologists have not been able to relate the anamorphic state with the teleomorphic state.

Classification of deuteromycotina (contd)

- The sexual state is known but very rare and the organism commonly occurs in the asexual state.
- The sexual state of a fungus always takes precedence over the asexual state.
- Organisms with similar asexual state can form dissimilar sexual state and vis-à-vis.
- There are four classes in this group namely:
 - Class: Agonomycetes
 - Class: Blastomycetes
 - Class: Coelomycetes
 - Class: Hyphomycetes

Class: Agonomycetes

- Members of the agonomycetes produce mycelium and in many cases they produce a vegetative structure called **Sclerotium**. Sclerotium is an aggregation of hyphae in fungi usually used in storing food also serves as a survival resistance structure. Fungi found in this group include *Sclerotinia*, *Rhizoctonia* which perfect/sexual state is *Thanateporus* and *Sclerotium* which perfect state is called *Pellicularia*.

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Class: Blastomycetes

- Organisms in this class are yeast-like with or without pseudomycelium. Members lack true mycelium or well developed mycelium. They usually reproduce by budding and the conidia type is the blastospores. Genera in this class include *Geotrichum*, *Candida*, *Rhodotorula* and *Cryptococcus*.

Class: Coelomycetes

- fungi which bear conidia within the cavity of the substrate in which they grow or within the cavity of the fungal tissue in this particular class. Such cavity can be in form of any of the following fruit bodies:
 - Acervulus
 - Pycnidium
 - Pycnothrium or stroma
- The class consists of two orders which are: Order Sphaeropsidales and Order Melanconiales.

Order: Melanconiales

- The members of this order are either parasites of higher plants or saprophytes.
- The body of members is in form of a dense cluster of pseudoparenchymatous tissue with short conidiophores which is saucer shaped and called acervulus.
- The acervulus which is the fruit body maybe produced on the epidermis, below the epidermis or below the cuticle of the leaf. Examples of genera in this order are *Colletotrichum*, *Discula*, *Gloeosporium*.
- Below is the structure of an **acervulus**.
- This is a saucer-shaped structure consisting of stromatic mass of hyphae and a fertile layer of conidiophores, an example of the acervulus is in Figure 15.3.
- The conidiophores in this order arise from a mat of closely crowded hyphae forming a small disc called stroma.

Order: Sphaeropsidales

- Fungi in this order have pycnidium as the fruit body.
- The pycnidium is flask shaped but it is a false perithecium.
- It consists of numerous conidiophores bearing conidia instead of asci and strands of hyphae attached to it.
- The conidia usually escape through ostiole or when the pycnidium burst.
- Members are either parasitic or saprophytic.
- Genera in this order include *Phoma*, *Phomopsis*, *Macrophoma* and *Botryodiplodia*.

Class: Hyphomycetes

- In this class you will find fungi with well developed mycelium and which reproduce by conidia borne on separate hyphae or on an aggregation of hyphae.
- These hyphae can be in form of synnemata or sporodochia.
- Members can be saprophytic or parasitic.
- The class consists of a single order- Moniliales.

➤ There are four families in the order moniliales

(a) Family: Moniliaceae

➤ Here the conidia arise on phialides borne on the conidiophores that are produced on mycelium. Therefore, you call such a conidium a phialospore.

➤ The conidiophores are free and the hyphae septate.

➤ The hyphae and conidia could be colourless, pale or brightly coloured. Genera in this family include *Monilia*, *Verticillium*, *Botrytis*, *Penicillium*, *Aspergillus* and *Trichoderma*.

(b.) Family: Tuberculariaceae

- The conidiophores in this family are in form of sporodochia in which the spore mass is supported by a superficial cushion-like mass of short conidiophores.
- This can be found in genera like *Fusarium* and *Tubercularia*.
- A conidium can have a single septum and thus called a microconidium but when it possesses more than one septum it is called a macroconidium.
- Figure 15.6: Conidia of a *Fusarium* sp showing a microconidium and two macroconidia.

(c.) Family: Dematiaceae

- Most species of this family are saprophytes and they possess dark coloured mycelia and conidia.
- While some are parasitic on plants and animals including man.
- Some are either brown or dark brown while some appear black. You can find genera such as *Alternaria*, *Curvularia*, *Cercospora* and *Dreschlera* in this family.
- Figure 15.7a: *Alternaria* sp bearing multicellular muriform conidia.
- Figure 15.7b: A species of *Curvularia* showing oval shaped conidia.

(d.) Family: Stilbaceae

- Members have conidia which are borne on modified conidiophore called synnemata (pl. synnemata).
- In this fruit body, the branched or unbranched conidiophores are very close to each other and often to the top where they become free and diverge.
- The conidia arise from the free end of the conidiophores as seen in the Figure below. Example is *Doratomyces*.
- Conidia