Subclass 2: Plectoscomycetidae

General characteristics

1. Asci are unitunicate.
2. Producing the cleistothecium ascocarps.
3. Have a large number of fungi,

Order 1: Eurotiales

Family1: : Eurotiaceae

Some individual are saprobes, others are parasites on animals, plant and human causing many diseases, some causing food spoilage.

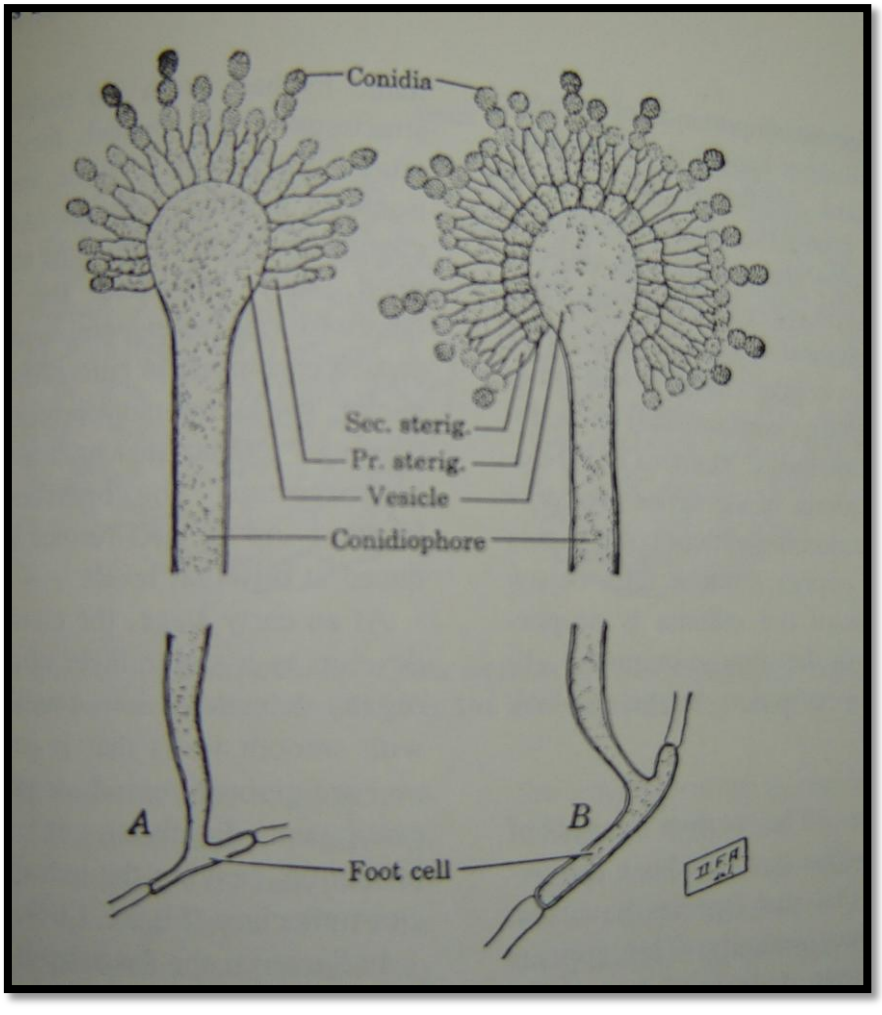
G**enus1 :** ***Aspergillus (=Eurotium)***

The air everywhere seems to contain the conidia of these organisms. The genus *Aspergillus* contains 200 species and great many varieties. These organisms causing the spoilage of food, texture, and leathers, and some species causing diseases in human such as Aspergillosis which causes by *A. fumigatus*. symptoms closely resemble those of tuberculosis and it is probable that some doctors mistakenly diagnosed the disease as tuberculosis. Because of their great enzymatic activities, Aspergilli are employed in several industrial processes. Such as production of citric acid and gluconic acid by *A.niger*, production of some enzymes by *A. oryzae* and some species are used to produce antibiotics, while *A. nidulans* causes nail infection, *A. flavus* is aflatoxin producer and cause liver cancer and *A. clavatus* cause granular lesions in lungs.

Somatic structure:

The mycelium produces an abundance of conidiophores arise singly from the somatic hyphae, the hyphal foot cell. The conidiophores are long, erect hyphae, each terminating in a bulbous head, the vesicle. As the multinucleate

vesicle develops, a large numbers of conidiogenous cells are produced over its entire surface completely covering it. One or two layers of conidiogenous cells (sometimes termed sterigmata) may be produced, according to the species. The conidium-bearing cells whether primary or secondary are typical phialides. The phialides reach maturity; they begin to form conidia at their tips, one below other in chains.

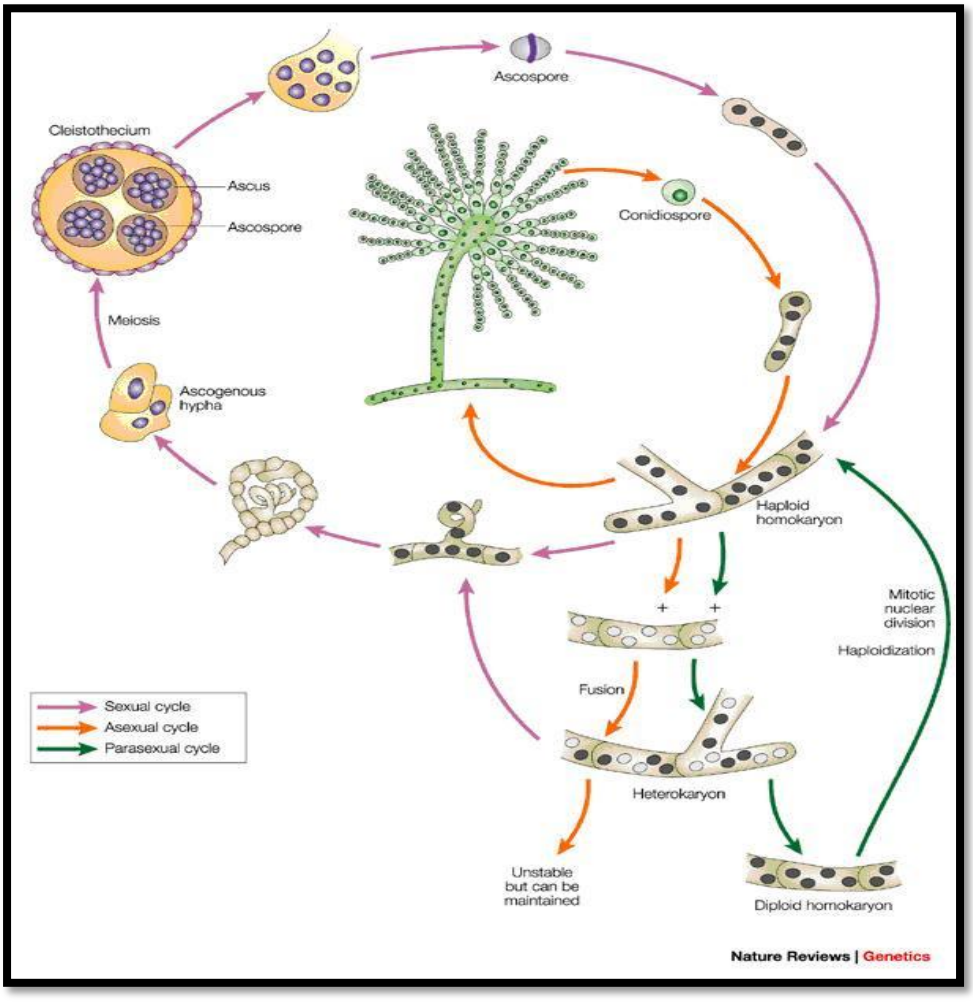


Asexual stage of *Aspergillus*(conidial stage)

Sexual reproduction

The perfect stages of most species of *Aspergillus* have not discovered and it is likely that such species have lost their ability to reproduce sexually.

Sexual reproduction takes place in several ways and results in at least five different types of ascocarps. The sexual or perfect stage of *Aspergillus* called *Eurotium* or *Emericella*. In *Eurotium* the sex organs, antheridia and ascogonia are produced close to each other on somatic hyphae. Both are multinucleate, elongate structures, often helical, they coil around each other.



Life cycle of *Aspergillus*

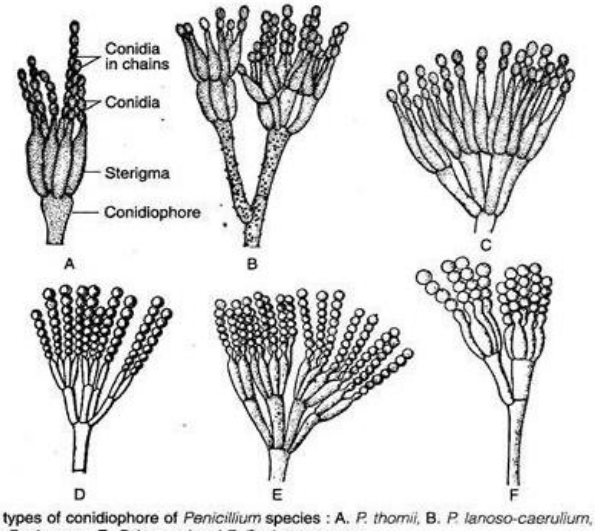
Genus 2: *Penicillium*

It is so called green molds and blue molds. We so frequently find on citrus and other fruits, on cheeses in the refrigerator, and other food stuffs. The conidia of *Penicillium*, like those of *Aspergillus*, are everywhere in the air and in the soil. In the biological Lab, they are as frequent contaminants as *Aspergillus* and *Rhiozpus*.

Various species of *Penicillium* attack and destroy fruits*; P. italicum* and *P. digitatum* are common pathogens of citrus and fruits causing blue mold and green mold respectively. *P. expansum* causes a decay of apples in storage. *P. roqueforti* is responsible highly priced flavor of Roqueforti cheese and *P. camemberti* for of Camembert cheese. *P. notatum* or *P. chrysogenum* was used for penicillin production, and *P. griseofulvum* was used for griseofulvin production, which is the best antibiotic effective in control of fungal skin diseases (Dermatomycoses), such as athlete s foot. The sexual stage of *Penicillium* is called *Talaromyces*.

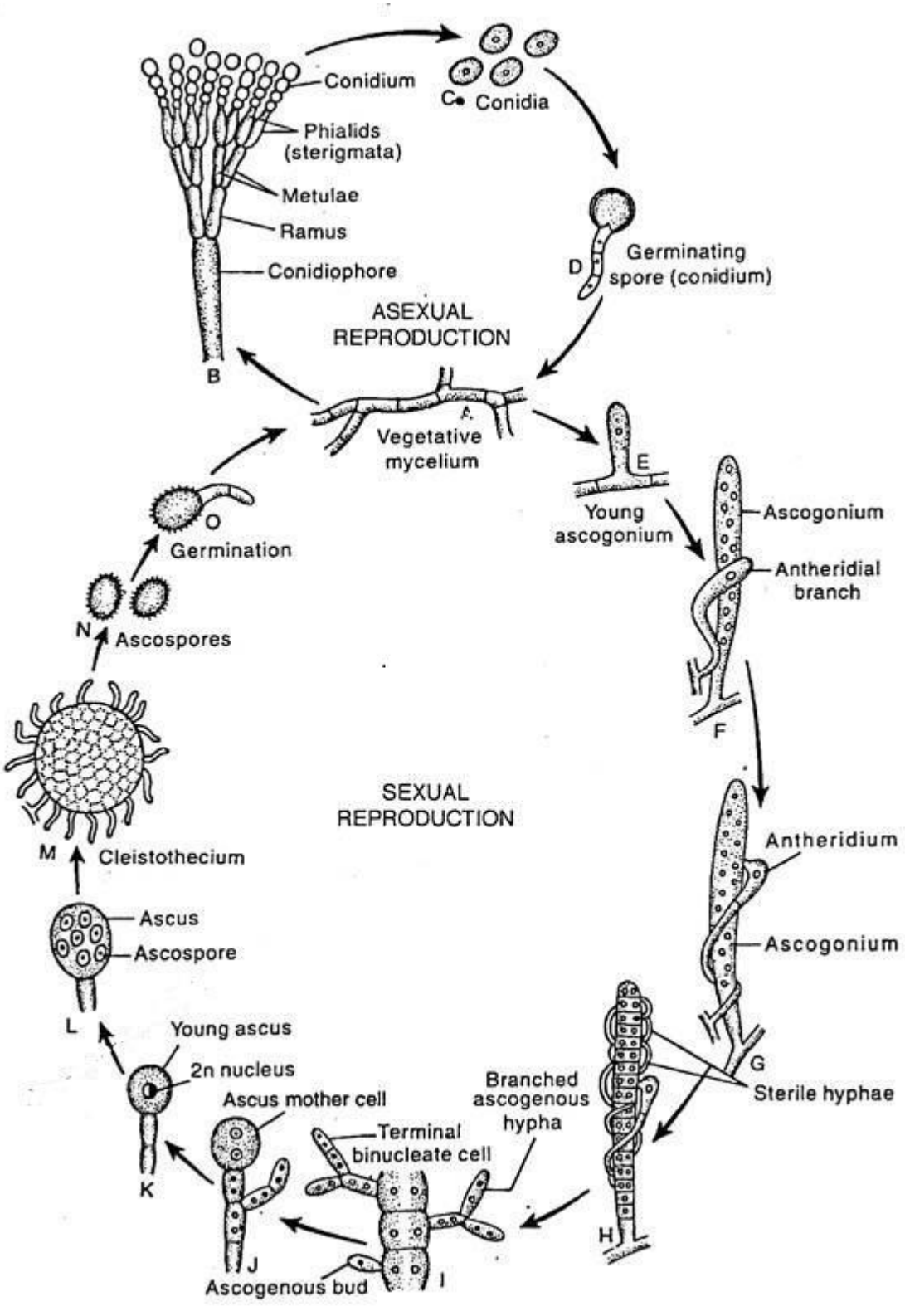
Morphology of *Penicillium*:-

The mycelium produces simple, long, erect conidiophores that branch about two-thirds of the way to the tip, broom-like fashion. The conidiophore, commonly referred to as the brush. The multiple branching of the conidiophore ends in a group of phailides that bear the long conidial chain.



3 : Different types of conidiophore of *Penicillium* species : A. *P. thomii*, B. *P. lanoso-caerulium*, C. *P. vermiculatum*, D. *P. glaucum*, E. *P. herquei* and F. *P. chrysogenum*

Asexual stage of *Penicillium* (conidial stage)



Life cycle of *Talaromyces vermiculatus* (*Penicillium vermiculatum*)

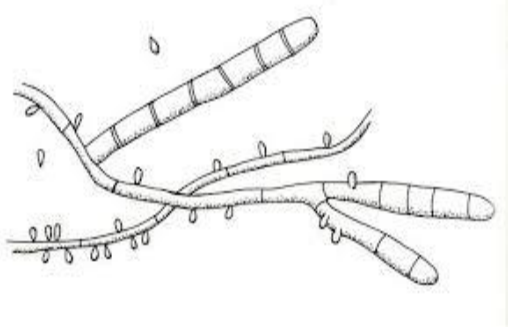
Family2 : Gymnoascaceae

Fungi that includes the ascomycetous state of many of the dermatophytes and several of the systemic pathogens for humans :*Histoplasma capsulatum* , *Blastomyces dermatidis, Nannizzia(Microsporum),Blastomyces, Arthroderma (Trichophyton).*Until the sexual forms were recognized, these pathogens were classified with Imperfect Fungi

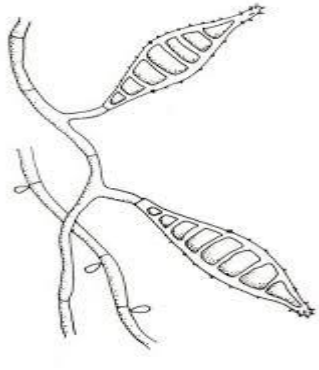
Nannizzia (Microsporum): Usually devoid of conidia (macro- or microconidia). Septate hyphae with terminal chlamydoconidia, often pointed at the end. Macroconidia are often irregular or non-uniform in shape. Colonies on culture media are flat, silky in appearance. Growth of colonies on culture media is tight. On reverse of colony - pigment is reddish-brown in color.

Arthroderma(Trichophyton) : The word "trichophyton" literally means "hair plant". Presence of macroconidia in cultures varies and may not help in identification of cultures. Microconidia shape and presence varies. Microconidia are globose (round-shaped), pyriforme (pear-shaped), or clavate (club-shaped). Most common species include:

Trichophyton mentagrophytes , *T. rubrum* , *T. tonsurans* ,*T. verrucosum* ,*T. violaceum* ,*T. schoenleinii* and *T. ajelloi* (rare infects humans)



Trichophyton



Microsporum