Benha University	**3rd level (Microbio. & Chem.)**
Faculty of Science	**May 2013**
Botany Department	**Time: 2 hours**

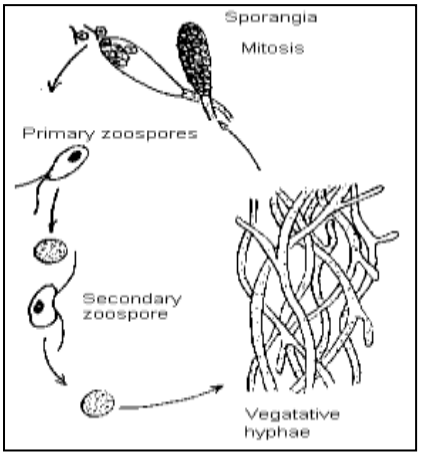
Mycology

Answer the following questions

1- **What do you know about 2 only of the following**:

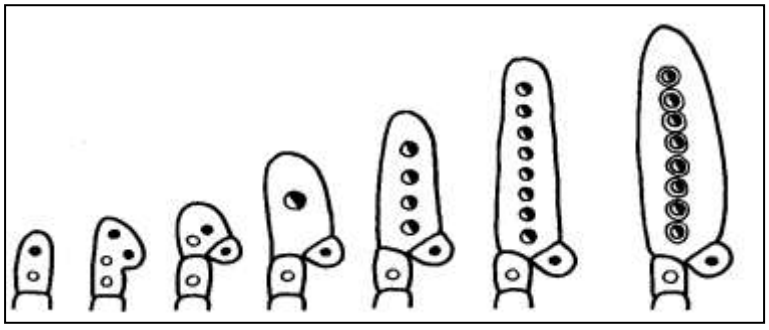
A. Dimorphic phenomenon

This phenomenon appear during the asexual life cycle of *Saprolegnia sp* which the biflagellate zoospore take two shapes bear shape and kidney shape .

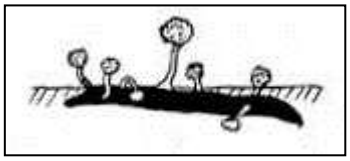


B. Ascus formation

Ascus formation occurs on the same mycelia that produce conidia. They are preceded by the formation of multinucleate gametangia called "antheridia" and "ascogonia". The male nuclei of the antheridium pass into the ascogonium via a tubular outgrowth of the ascogonium known as the trichogyne. "Plasmogamy", or the fusion of the two cytoplasms, has now taken place. The male nuclei then pair with the genetically different female nuclei within the common cytoplasm but do not fuse. Hyphae now begin to grow out of the ascogonium. As the hyphae develop, pairs of nuclei migrate into them and simultaneous mitotic divisions occur in the hyphae and ascogonium. Cell division in the developing hyphae occurs in such ways that the resulting cells are "dikaryotic" .



C. Sclerotium



Sclerotium is a compact globose or elongated structure formed by aggregation and adhesion of hyphae . they are hard resting bodies resistant to adverse conditions it may remain dormant for long periods of times sometimes for several years and thus represent the resting stage of the fungus . on the return of favorable conditions the sclerotia usually germinate to form hyphae or may form reproductive structures.

2- Write the basis of classification of two only of the following:

A. Mucorales

Aflagellatae or aplantae : the Sporangiospores are non motile

Order : Mucorales

Include the following families :

- Mucoraceae
- Thamnidiaceae
- Chaenophoraceae
- Cephalidaceae

B. Masttigomycotina

It is divided into 2 sub– classes:

1- Uniflagellatae : Sporangiospores are motile by one flagellium.

2- Biflagellatae: Sporangiospores are motile by two flagella. it classified into

2 orders.

Order: Saprolegniales

Family :Saprolegniaceae

Order: Peronosporales

The order is divided into 3 families as follows:

- Species living as parasites or saprophytes, spornagiophores differing little from vegetative hyphae ……. Pythiaceae
- Sporangia in chains, club-shaped sporangiophores crowded beneath the epidermis of the host …….Albuginaceae.
- Sporangia may be function as conidiosporangia and are borne singly at the ends of branched sporangiophores which emerge from the host in early stages of development ……...Peronosporaceae.

C. Ascomycotina

They are classified on the basis of presence or absence of an ascocarp.

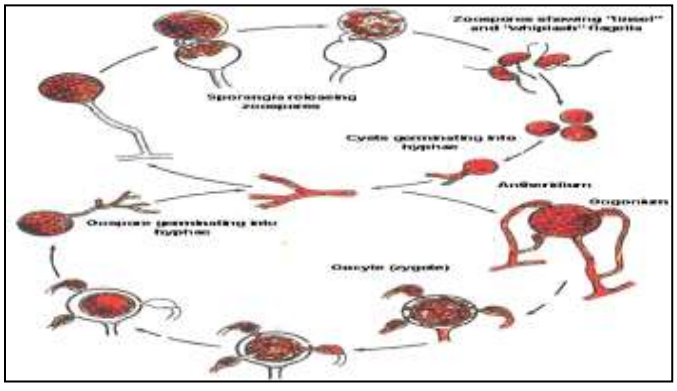
- Asci arising naked: no ascogenous hyphae
  or ascocarp produced ……Protoascomycetes.
  O.Endomycetales
  F.Endomycetaceae
- Asci produced in an ascocarp from
  Ascogenous hyphae ……Euascomycetes
  On the bases of the shape and structure of the ascocarp; Euascomycetes are divided into 3 series :
  - Plectomycetes : The ascocarps are generally of cleistothecium type
  - Pyrenomycetes :The ascocarp is either a globose or flask-shaped
  - Discomycetes : The ascocarp are generally apothecium type(cup shape)

3- Explain with drawing the life cycle of *Pythium* or *Albugo*

- ***Pythium***

Asexual reproduction: sporangia are either terminal or intercalary and globose or oval. Production of zoospores is proceeded by the formation of vesicle at the tip of a tube which protrudes from the sporangium. The whole protoplase of the sporangium flows into the vesicle where differentiation of zoospore takes place.

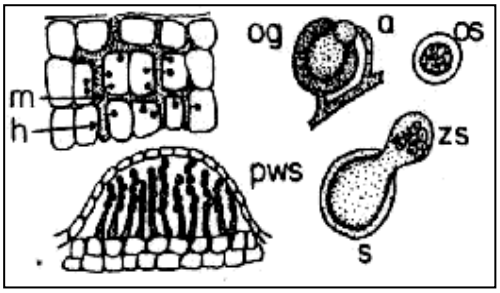
sexual reproduction: it is oogamous.the sex organs are formed at the end of the growing season within the dead tissues of the host. The cogonia and antheridia are formed near together and often on the same hyphae. Fertilization takes place by fertilization thick walled oospore developes. At favourable condition , the oospore germinates to a small hyphae. Prior to germination the fusion nucleus divides a number of times. It is probable that the first division is meiotic.



- ***Albugo***

Asexual reproduction: when mycelium reaches its maturity it produces sporangiophores ,sporangia are abstracted from the tips of the sporangiophores continues exerting pressure on the host epidermis causing it to bulge and burst ,it released and disseminateted by wind or current of water , sporangia either give rise to zoospore or germinate as conidium.

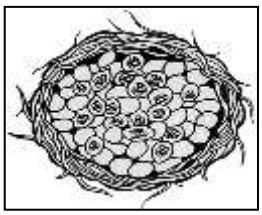
Sexual reproduction : the oogonium which develop an egg cell, and antheridia which forms numerous male nuclei, fertilization is accomplished by the transfer of the male nuclei through a fertilization tube into the oogonium. One male nucleus fuses with the nucleus of the egg and the zygote is then formed which is surrounded by 3-layered thick wall, after disintegration of the host tissue the zygotes are liberated and under favourable condition, germination takes place resulting in the formation of biflagellated zoospores. The latters are capable of infecting new hosts.



4-Compare and contrast between two pairs only of the following :

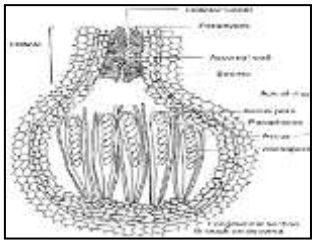
A. Ceistothecium & Perithecium

Cleistothecium:



It is a rounded cleistothecium like structure without an ostiole. The Asci are globose or broadly oval usually scattered at different levels within the peridium. The ascospore escape by the decay or irregular of the wall of the asci and spore fruit.

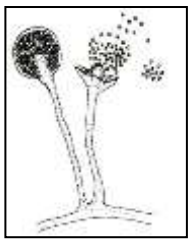
Perithecium:



It is a small rounded or flask-shaped ascocarp. it has an apical pore or opening the ostiole. Through this opening the ascospores escape. The hymenium lines the inner surface of the cavity of the perithecium either throughout or only at the base. It is enclosed by the peridium. The thin-walled asci are intermingled with the paraphyses. The ostiole region also develops sterile hair the paraphyses.

B. *Mucor* & *Circinella*

***Mucor*:**



Sporangiophore arises singly from the mycelium either unbranched or branched sympodially or monopodially, rizoids are never present.

***Circinella**:*

Sporangiophore branched, side branches strongly curved.

C. **Uredospores & Teleutospres**

Uredospores

- Uredospores are red or orange colour
- They are binucleate cell stalked
- Thick wall with many spines

Teleutospores

- Teleutospores are clongated, black and are two-celled with an outer smooth thick wall.
- They are stalked

5-Write the general characteristics of Basidiomycotina

1- The vegetative phase was a developed filamentous septate mycelium.
2- Complete absence of motile cells in the life cycle.
3- The development of secondary mycelium in life cycle.
4- Asexual reproduction by means of conidia.
5- Presence of basidiospores (sexual units) produced by the basidium.
6- The basidia are generally enclosed in the spore fruit called the basidiocarp.