



Sohag University  
Faculty of Science  
Department of Botany



3<sup>rd</sup> year Chemistry and Microbiology students  
Date: 19/1/2014  
Time: 3 hours  
Course code: Bot. 305

## EXAMINATION OF AQUATIC AND SOIL MYCOLOGY

### ANSWER ALL THE FOUR QUESTIONS IN THE ANSWER NOTEBOOK:

السؤال الأول و الثالث: أعد كتابة الجمل كاملة في كراسة الأجابه:

#### Part One: Aquatic Mycology (82.5 points)

##### QUESTION 1:

##### A. Mark the following sentences with “√” or “x” and correct the wrong sentences: (6 points)

1. Marine microbes produce 50% of the produced oxygen and consume 50% of the produced carbon dioxide. ( )
2. Marine Ascomycetes represents around 30% of the total known filamentous marine fungi. ( )
3. Ingoldian hyphomycetes belong to the Phylum Ascomycota only. ( )
4. Species of *Jahnula* have ascospores with gelatinous sheath or appendages. ( )
5. The greatest biodiversity of aquatic fungi in the Middle East, followed by South America. ( )
6. Most of the hosts of Trichomycetes are aquatic forms. ( )

##### B. Choose the correct answer: (8 points)

1. The largest order of marine fungi is .....  
(a) Pleosporales. (b) Halosphaeriales. (c) Sordariales. (d) Xylariales.
2. Ingoldian hyphomycetes are found in:  
(a) running freshwater. (b) running marine water.  
(c) slow flowing water. (d) stagnant ponds.
3. Members of the Family Annulatasaceae is characterized by:  
(a) brightly coloured ascomata. (b) thin-walled asci without apical apparatus.  
(c) asci with a massive bipartite apical ring. (d) stromatic ascomata.
4. About ..... fungal species have been reported from aquatic habitats.  
(a) 1000 (b) 2000 (c) 3000 (d) 4000
5. Chytrids are:  
(a) saprobic. (b) parasitic on algae.  
(c) parasitic on insects and invertebrates. (d) all of the above.
6. .... in which the entire thallus may be converted into one or more reproductive structures.  
(a) Endobiotic. (b) Holocarpic. (c) Eucarpic. (d) Epibiotic.
7. The phylum Chytridiomycota has been divided into orders on the basis of:  
(a) ultrastructure of zoospores. (b) morphology of the thallus.  
(c) presence of rhizoids. (d) their position in/on substrates.

8. The ascomata wall is named:  
 (a) periphyses. (b) peridium. (c) ascus. (d) paraphyses.

**C. Complete the following sentences: (7.5 points)**

- The conidia of Ingoldian hyphomycetes are characterized by .....
- Miscellaneous aquatic anamorphic fungi can be classified into two main types based on Park (1972), namely ..... and .....
- Species of *Jahnula* are different from *Aliquandostipite* species by having ..... and .....
- In freshwater ascomycetes, gelatinous appendages or sheaths of the ascospores help them to ..... and .....
- Traditionally Trichomycetes were studied as having four orders namely: ....., ....., ..... and .....
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**D: Match sentences in column A with those in column B: (12 points)**

Column A	Column B
1. Algicolous fungi	<input type="checkbox"/> occurring in mangroves in tropical and subtropical areas of the world. <input type="checkbox"/> growing on Algae. <input type="checkbox"/> found on sand grains associated with organic substrata <input type="checkbox"/> growing on leaves. <input type="checkbox"/> growing on corals.
2. Foliicolous fungi	
3. Manglicolous fungi	
4. Arenicolous fungi	
5. Meiospores in <i>Allomyces</i>	<input type="checkbox"/> produced inside asci. <input type="checkbox"/> diploid zoospores that released from thin-walled zoosporangia. <input type="checkbox"/> biconical structures that typically form after conjugation between different thalli. <input type="checkbox"/> thin-walled, elongate, colorless zoosporangia. <input type="checkbox"/> is an elongate sporangium containing a single uninucleate sporangiospore and having one to several basally attached filamentous appendages continuous with the sporangial wall. <input type="checkbox"/> haploid zoospores that upon germination, give rise to gametothalli.
6. Trichospore	
7. Mitospores in <i>Allomyces</i>	
8. Zygosporos in Trichomycetes	
9. Ascospores	

10. <i>Coelomomyces</i>	) an epiphyte on the red alga <i>Centroceras clavulatum</i>
11. <i>Rhizophydium</i>	) an obligate parasite, host specific, of the larvae of some mosquitoes.
12. <i>Chytridium polysiphoniae</i>	) The causal of phytoplankton chytridiomycosis.

**QUESTION 2:**

**A. Differentiate between each pair of the following:**

1. Oceanic marine fungi vs. intertidal marine fungi. (6 points)
2. Direct vs. indirect methods for studying freshwater ascomycetes. (10 points)
3. Haploid vs. diploid generation in *Allomyces*. (6 points)

**B. Discuss with drawing (when possible) the following sentences:**

1. Characteristic features of the genus *Aliquandostipite*. (6 points)
2. Diversity of freshwater ascomycetes. (6 points)
3. Single ascospore isolation of freshwater ascomycetes. (10 points)
4. Characteristic features of the order: Harpellales. (5 points)

**Part Two: Soil Mycology (82.5 points)**

**QUESTION 3:**

**A. Mark the following sentences with “√” or “x” and correct the wrong sentences:** (11 points)

1. Apical ring in the ascus aids in ascospore dispersal. ( )
2. Basidiomycetes produce coenocytic mycelium. ( )
3. Sexual reproduction in most species of Basidiomycetes produce four basidiospores. ( )
4. Ascomycetes are primary colonizers of most substrates. ( )
5. Yeasts belong to both Ascomycota and Basidiomycota. ( )
6. Smut and rust fungi are two groups of saprobes. ( )
7. Sporangia are distinguished from sporangiola by their small size and low number of sporangiospores. ( )
8. Basidiomycetes are the principal agents that decay cellulose and lignin. ( )
9. Fungi are good research models. ( )
10. Species of *Taphrina* are mostly saprobic on Fagaceae and Rosaceae. ( )
11. The key feature that distinguishes Taphrinomycotina and Saccharomycotina from Pezizomycotina is that ascogenous hyphae and an ascocarp are lacking in the first two groups. ( )

**B. Choose the correct answer:** (12 points)

1. Mycelium in basidiomycota is characterized by:
  - (a) dark color.
  - (b) coenocytic mycelium.
  - (c) The presence of clamp connections.
  - (d) thick and rough walls.

2. In gymenocarpous development in Agaricales, the hymenium:
  - (a) Covered in inner veil.      (b) Remains naked and is never covered.
  - (c) Covered by universal veil. (d) Never exposed to air.
3. Benefits that we get from fungi include:
  - (a) food.      (b) degrade harmful compounds.
  - (c) organic matter decomposer. (d) all of the above.
4. Fungi live on leaf called:
  - (a) coprophilous.   (b) corticolous.   (c) foliicolous.
5. Anamorphic fungi are the anamorphic stages for:
  - (a) ascomycetes.   (b) basidiomycetes.   (c) zygomycetes. (d) a and b..
6. Members of Taphrinomycotina have:
  - (a) both yeasts and mycelial forms.   (b) yeasts only.   (c) mycelium only.
7. Yeasts are frequently isolated from:
  - (a) Soil.      (b) fruits.      (c) water.      (d) air.
8. In Zygomycota, sporangium is born on:
  - (a) conidiophores.   (b) sporodocium.   (c) Sporangiphore.   (d) ascogenous hypha.
9. Food spoilage fungi are:
  - (a) *Aspergillus*.   (b) *Penicillium*.   (c) yeast.      (d) all of the above.
10. Members of the class Hymenoascomycetes produce:
  - (a) Unitunicate asci.   (b) bitunicate asci.   (c) prototunicate asci.
11. The conidium ontogeny in which the conidium elongates and swells before being cut off by a septum, the conidium usually originates at a narrow point on the conidiogenous cell is called:
  - (a) Thalloblastic.      (b) Thallic.      (c) Blastic.
12. Sterile short hyphae that line the inner surface of the ostiole in ascomata are called:
  - (a) periphyses.      (b) paraphyses.      (c) pseudoparaphyses.

**C. Complete the following sentences:** **(12.5 points)**

1. The Phylum Zygomycota include four sub-phylums namely: ....., ....., ..... and .....
2. The genus *Chaetomium* is characterized by ....., ..... and .....
3. The most famous genera in the phylum Taphrinomycotina are ..... and .....
4. There are seven morphological groups of conidia, these shapes are: ....., ....., ....., ....., ..... and .....
5. Basidiomycetes are diverse group and include different common forms namely: ....., ....., ..... and .....
6. The Phylum Ascomycota contains three sub-phylums namely: ....., ..... and .....
7. Yeasts are used to produce ..... and .....

**D: Match sentences in column A with those in column B:**

**(7 marks)**

Column A	Column B
1. Conidiomata	) Diseases of above-ground plant organs in which the infected twig undergoes repeated branching to form dense tufts of twigs.
2. Pleomorphy	) Conidia, have walls that are not continuous with any part of the walls of the conidiogenous cell.
3. A rhizomorph	) Consists of a number of hyphae lying parallel to one another and sometimes enveloped in a sheath or cortex.
4. Teleomorph	) The capacity of a fungus to produce more than one form or type of spores in its life cycle.
5. Conidiogenous cell	) (perfect or meiotic): that produce ascospores or basidiospores
6. Endogenous	) Conidiomata are structures in which conidiophores are grouped together
7. Witches' brooms	) The hyphal cell from which or in which a conidium is formed

**QUESTION 2:**

**A. Compare each pair of the following (use drawing when possible):**

**(20 marks)**

1. Asexual reproduction in Zygomycota.
2. Annelidic and phialidic conidiogenesis.
3. Importance of Ascomycetes.

**B. Explain the following sentences with drawing only:**

**(20 marks)**

1. Life cycle of *Rhizopus stolonifer*.
2. How basidia are formed?
3. How asci are formed from two morphologically different gametangia.
4. Life cycle of *Saccharomyces cerevisiae*.
5. The formation of the secondary mycelium in Basidiomycota.

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With all best wishes

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