

Match the following definitions with the appropriate term.

[01] A closed spherical ascoma

A. ascogenous hyphae

B. cleistothecium

C. conidiophore

D. calyptra

E. mycorrhizae

F. trichogyne

G. volva

H. telium

[02] Intimate and mutually beneficial symbiotic associations between fungi and roots; characteristics of most vascular plants.

[03] A receptive protuberance of the 'female' gametangium for the conveyance of spermatia.

The definitions come from the textbook glossary. A closed ascoma is a cleistothecium (B), the fungal/root symbiosis is a mycorrhizae (E), and the last is found in the Neurospora lifecycle, it's the trichogyne (F)

[04] Although Chytridiomycota is now grouped with the major fungal groups (Zygomycota, Ascomycota and Basidiomycota), it has many traits which are different from any of the other groups. But, which of the following trait(s) does it share with the other major groups?

A. coenocytic (multi-nucleate cell units)

B. chitinous cell walls

C. dikaryotic vegetative colonies

D. asexual spore production from conidiophores

E. motile zoospores

F. A and B

G. B and C

H. A, B and D

The shared traits are multi-nucleate cell units and chitinous walls (F)

[05] Entomophthorale is an example of an order (member of the Zygomycota) of ecological importance for which of the following reason(s)?

A. It causes soft rot on many species of plants, some of importance as crops (especially fruits and seeds).

B. It is the cause of the Muscii blight, affecting cereal crops such as wheat and barley.

C. Many members of the order (and other Zygomycota) form an intimate symbiotic relation with the roots of plants (the endomycorrhizae).

D. They are often a pathogen of insects and other small animals, and could be used for biocontrol of common insect pests.

E. It is the major fungal order forming an intimate symbiotic relation with algae (usually Chlorophytes, rarely the prokaryotic cyanobacteria) to create the remarkable lichens.

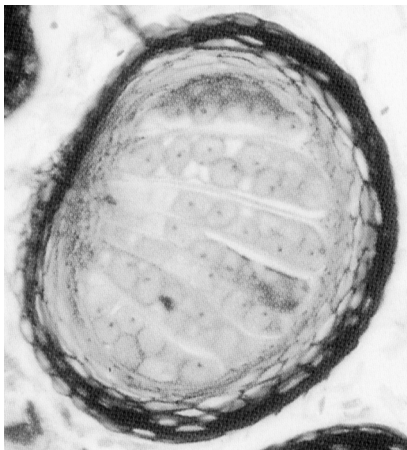
F. Many members of the order are common spoilage molds (growing on bread and cheese, for example, making them inedible).

G. C and E

H. None of the above.

The name (ento [insect]) provides a hint, it's an order that 'eats' insects alive (D)

[06] Which of the following is/are correct for the photograph (choose the best answer)?



A. The image shows an example of the spore-ejecting structure of Pilobolus (Zygomycota).

B. This is an example of a zygosporangial structure of one of the Glomeromycetes, in which the conidiophores are about to break through the cellulose wall of the plant host.

C. It appears to be a basidium (Basidiomycota), based on the presence of sterigma.

D. The image shows a beaked perithecia (the term used to describe an ascomata (Ascomycota) with a small opening for ejection/release of the ascospores).

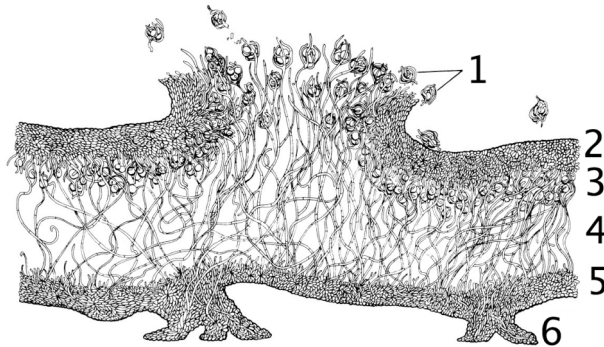
E. It appears to be a germinating zoosporangium of Chytridiomycota, within its host.

F. It is the spore-bearing structure of Armillaria (Basidiomycota).

G. It is an ascoma, containing asci and ascospores

H. None of the above

From your textbook, it has asci and ascospores inside, but is beakless (unlike Neurospora in your lab), the best answer is G.



[07] Identify the most appropriate group(s) on the basis of the vegetative and reproductive structures diagrammed in the figure (choose the best answer)?

- | | |
|------------------|----------------------|
| A. Gasteromycete | B. Hymenomycete |
| C. Ascomycete | D. cyanobacteria |
| E. A and D | F. B and D |
| G. C and D | H. None of the above |
- Ascomycetes and cyanobacteria are both appropriate as mycobionts and photobionts, respectively, in the lichens: G.*

[08] Which of the labeled region(s) identifies the major location(s) of the photobiont in the vegetative structure (choose the best answer)?

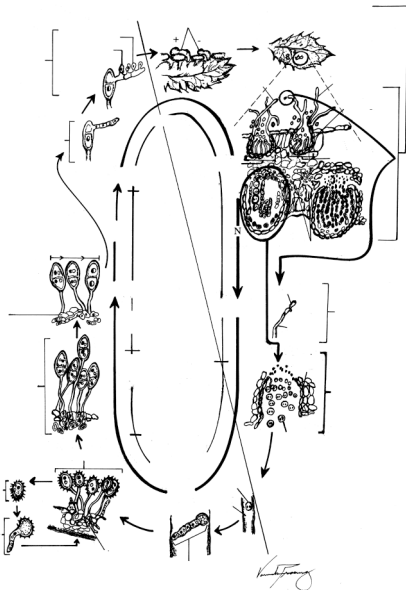
- | | | | |
|------------------------|-----------------------|---------------|---------------|
| A. None of the regions | B. All of the regions | C. 2, 4 and 5 | D. 3, 4 and 5 |
| E. Only 2 | F. Only 3 | G. Only 4 | H. 2 and 5 |

As described in your textbook, the photobiont is found predominantly in region 3: F. The front page of your term test illustrates the symbiotic arrangement in region 3.

Match the following heterotrophic divisions of the Fungal Kingdom with the one most distinguishing characteristic for each division. Choose the best answer (you may choose an answer only once).

- | | | | |
|--------------------|---------------|-------------|--------------|
| [09] Zygomycota | A. dikaryotic | B. aseptate | C. conidia |
| [10] Ascomycota | D. septate | E. dolipore | F. karyogamy |
| [11] Basidiomycota | G. ascomata | H. hymenium | |

Zygomycota are usually aseptate (B), Ascomycota have ascomata (spore bearing structures) (G), Basidiomycota have dolipore structures in their septa (E).



[12] Which of the following life stage(s) of the rust life cycle (left) operate to enhance pathogenic virulence?

- | |
|-------------------------------------|
| A. overwintering teliospore stage |
| B. basidiospore stage after meiosis |
| C. formation of aeciospores |
| D. urediospore re-infection |
| E. all of the above |
| F. none of the above |
| G. C and D |
| H. A and D |

Students tell me the answer is G.

Match the following sub-divisions of the Basidiomycota with the one most distinguishing characteristic for each division. Choose the best answer (you may choose an answer only once).

- | | |
|-------------------------------|--|
| [13] Hymenomycetes | A. gill fungi |
| [14] Gasteromycetes | B. club-shaped, aseptate basidia, usually bearing four basidiospores on a sterigma |
| [15] Pucciniomycotina (rusts) | C. conidia |
| | D. basidiomata surrounded by a peridium |
| | E. dolipore |
| | F. stable dikaryotic state |
| | G. ascomata |
| | H. seldom form basidiomata |

Hymenomycetes are the gill fungi (A), Gasteromycetes are the puffballs (basidiomata surrounded by a peridium) (D), the rusts seldom form basidiomata (H).

[16] Which one of the following characteristics is found only in land plants?

- | | | | |
|---------------|-------------------------|-------------------------------|--------------------------|
| A. antheridia | B. hydroids | C. alternation of generations | D. food-conducting cells |
| E. archegonia | F. cellulose cell walls | G. non-motile gametes | H. none of the above |

Hydroids (to transfer water) are land-specific, neither required nor found in multi-cellular aquatic groups (B).

[17] Which of the following characteristics are found in some or all of the Chlorophyta (green algae) groups and in all land plants (choose the best answer)?

- | | | | |
|-------------------------|---------------------------|-------------------------|-------------|
| A. phycoplastic mitosis | B. phragmoplastic mitosis | C. chlorophylls a and c | D. hydroids |
| E. A and C | F. A and D | G. B and C | H. B and D |

Phragmoplastic mitosis is a trait shared by some algae and all land plants (B).

[18] What unique characteristic(s) distinguish Lycopodiaceae from other Lycophytes?

- | | | | |
|------------------|--------------------|---------------------|----------------------|
| A. homosporous | B. siliceous walls | C. eustelar anatomy | D. prostelar anatomy |
| E. heterosporous | F. anisogamy | G. B and D | H. none of the above |

Lycopodiaceae is homosporous, unlike the Sellaginaceae (A).

[19] Which of the following characteristics are key component(s) of the successful invasion of land by plants (choose the best answer)?

- | | |
|---------------------------------------|---------------|
| 1. stomata | A. 1, 2 and 3 |
| 2. archegonium and antheridium | B. 2, 3 and 4 |
| 3. vascular tissue | C. 3, 4 and 5 |
| 4. indeterminate growth of sporophyte | D. 4, 5 and 6 |
| 5. embryophyte | E. 1, 3 and 5 |
| 6. phragmoplastic cell division | F. 2, 3 and 5 |
| | G. 3, 4 and 6 |
| | H. 1, 3 and 6 |

The best answer is E (stomata, vascular tissue and embryophyte, all play a direct role in protection from dessication).

[20] Place the following groups in order of increasing complexity of their adaptations to survival on land, or appearance in the fossil record?

- | | | | | |
|--------------|---------------|--------------|----------------------|------------|
| 1. Cycadales | 2. Liverworts | 3. Hornworts | 4. Coniferales | 5. Bryidae |
| A. 1,2,3,4,5 | B. 2,1,4,3,5 | C. 2,3,5,1,4 | D. 5,4,2,3,1 | |
| E. 5,4,3,2,1 | F. 4,5,3,2,1 | G. 3,4,5,1,2 | H. none of the above | |

The answer is C.

[21] The life cycle of a Hepatophyta (liverworts) contains an asexual propagule known as the:

- | | | | |
|---------------------|--------------------|-------------------|----------------------|
| A. archiegoniophore | B. hepatosporangia | C. sporangium | D. antheridiophore |
| E. gemma | F. strobilus | G. microsporangia | H. none of the above |

It is the gemma: E.

[22] The life cycle of a Bryidae (moss) can be functionally divided into three distinct vegetative structures. The vegetative structure unique to bryophytes is (choose the best answer):

- | | | | |
|--------------|----------------|--------------|--------------|
| A. protonema | B. rhizoids | C. operculum | D. thallus |
| E. elator | F. gametophyte | G. strobilus | H. caulonema |

The answer is **A** (protonema).

[23] Which of the following *cannot* be used to distinguish an individual or group within the Pteridophyta (ferns)?

- | | |
|---------------------------------------|---|
| A. arrangement and form of the sori | B. form and function (fertile and sterile) of the leaves (fronds) |
| C. form and structure of the indusium | D. apical initial forming the sporangia (leptosporangia) |
| E. homosporic | F. superficial initials forming the sporangia (eusporangia) |
| G. heterosporic | H. All of the above can be used |

All can be used: **H**.

[24] What force allows trees to pull water to their top (a maximal height of 100 meters)?

- | | | |
|----------------------------------|----------------------------------|----------------------------------|
| A. The force of negative gravity | B. evapotranspiration | C. osmotic pressure |
| D. compressive strength of water | E. turgor (hydrostatic pressure) | F. The force of positive gravity |
| G. xylem pumps | H. None of the above | |

Students tell me the answer is evapotranspiration: **B**.

[25] Among the extant groups of gymnosperms, which of the following group(s) retain the characteristic of motile sperm?

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|------------------|----------------|--------------|--------------------------|
| A. Ginkgoales | B. Taxodiaceae | C. Cycadales | D. Gnetales (Gnetophyta) |
| E. Araucariaceae | F. A and B | G. A and C | H. A, B and E |

Cycadales and Ginkgoales have motile sperm: **G**.

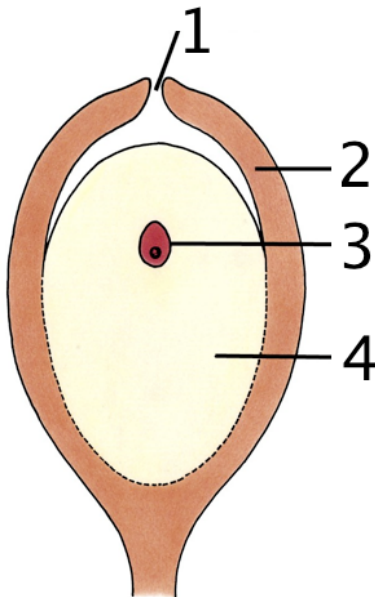
Match the following definitions with the appropriate term.

[26] In heterosporous plants, the female gametophyte, located within the ovule of seed plants

- | | |
|---------------------|--------------------|
| A. megasporophyll | B. microsporophyll |
| C. megasporocyte | D. microsporocyte |
| E. microgametophyte | F. megagametophyte |
| G. microsporangium | H. megasporangium |

[27] In heterosporous plants, the male gametophyte

The megagametophyte is considered the female (**F**), microgametophytes the male (**E**).



For the gymnosperm ovule shown in the diagram, identify the four compartments

- | | | |
|--------|-------------------|---------------|
| [28] 1 | A. nucellus | B. microspore |
| [29] 2 | C. megasporocyte | D. megaspore |
| [30] 3 | E. integument | F. micropyle |
| [31] 4 | G. megasporangium | H. megapyle |

As diagrammed in your textbook: **F, E, D, and (A or G)**.