Chapter 24 Exercises

Review Questions

1. Which polysaccharide is usually found in the cell wall of fungi?
- **a.** starch
- **b.** glycogen
- **c.** chitin
- **d.** cellulose

2. Which of these organelles is *not* found in a fungal cell?
- **a.** chloroplast
- **b.** nucleus
- **c.** mitochondrion
- **d.** Golgi apparatus

3. The wall dividing individual cells in a fungal filament is called a _____.
- **a.** thallus
- **b.** hypha
- **c.** mycelium
- **d.** septum

4. During sexual reproduction, a homothallic mycelium contains _____.
- **a.** all septated hyphae
- **b.** all haploid nuclei
- **c.** both mating types
- **d.** none of these

5. The life cycles of perfect fungi are most similar to which other organism?
- **a.** hydra that undergo asexual budding
- **b.** diploid-dominant pea plants
- **c.** haploid-dominant green algae
- **d.** bacteria undergoing binary fission

6. The most primitive phylum of fungi is the _____.
- **a.** Chytridiomycota
- **b.** Zygomycota
- **c.** Glomeromycota
- **d.** Ascomycota

7. Members of which phylum produce a club-shaped structure that contains spores?
- **a.** Chytridiomycota
- **b.** Basidiomycota
- **c.** Glomeromycota
- **d.** Ascomycota

8. Members of which phylum establish a successful symbiotic relationship with the roots of trees?
- **a.** Ascomycota
- **b.** Deuteromycota
- **c.** Basidiomycota
- **d.** Glomeromycota

9. The fungi that had no known method of reproduction used to be classified as _____.
- **a.** Ascomycota
- **b.** Deuteromycota
- **c.** Basidiomycota
- **d.** Glomeromycota

10. A scientist discovers a new species of fungus that introduces genetic diversity during reproduction by creating a diploid zygote. This new species cannot belong to which modern phylum of fungi?
- **a.** Zygomycota
- **b.** Glomeromycota
- **c.** Chytridiomycota
- **d.** Deuteromycota

11. What term describes the close association of a fungus with the root of a tree?
- **a.** a rhizoid
- **b.** a lichen
- **c.** a mycorrhiza
- **d.** an endophyte

12. Why are fungi important decomposers?
- **a.** They produce many spores.
- **b.** They can grow in many different environments.
- **c.** They produce mycelia.
- **d.** They recycle carbon and inorganic minerals by the process of decomposition.

13. Consider an ecosystem where all the fungi not involved in mycorrhizae are eliminated. How would this affect nitrogen intake by plants?

a. Nitrogen intake would increase.
b. Nitrogen intake would not change.
c. Nitrogen intake would decrease.
d. Nitrogen intake would stop.

14. A fungus that climbs up a tree reaching higher elevation to release its spores in the wind and does not receive any nutrients from the tree or contribute to the tree's welfare is described as a _____.

a. commensal
b. mutualist
c. parasite
d. pathogen

15. A fungal infection that affects nails and skin is classified as _____.

a. systemic mycosis
b. mycetismus
c. superficial mycosis
d. mycotoxicosis

16. The targets for antifungal drugs are much more limited than antibiotics or antiviral medications. Why?

a. There are more bacteria and viruses than fungi.
b. Fungi can only be targeted during sexual reproduction, while bacteria and viruses can be targeted at any point in their lifespan.
c. Fungi cause topical infections, while viruses and bacteria cause systemic infections.
d. Human cells are much more similar to fungi cells than bacteria or viruses.

17. Yeast is a facultative anaerobe. This means that alcohol fermentation takes place only if:

a. the temperature is close to 37°C
b. the atmosphere does not contain oxygen
c. sugar is provided to the cells
d. light is provided to the cells

18. The advantage of yeast cells over bacterial cells to express human proteins is that:

a. yeast cells grow faster
b. yeast cells are easier to manipulate genetically
c. yeast cells are eukaryotic and modify proteins similarly to human cells
d. yeast cells are easily lysed to purify the proteins

19. Why are fungal insecticides an attractive alternative to chemical pesticides for growing food crops?

a. Human consumption of fungal insecticides would not make a person sick, but ingestion of chemical pesticides can be harmful to humans.
b. A single fungal insecticide would kill a wider variety of insects than a chemical pesticide.
c. Fungal insecticides can eliminate both harmful insects and plant pathogens, while chemical pesticides only kill insects.
d. Fungal insecticides will decompose dying plants, enhancing the nitrogen content of the soil, while chemical pesticides are not decomposers.

Critical Thinking Questions

20. What are the evolutionary advantages for an organism to reproduce both asexually and sexually?

21. Compare plants, animals, and fungi, considering these components: cell wall, chloroplasts, plasma membrane, food source, and polysaccharide storage. Be sure to indicate fungi's similarities and differences to plants and animals.

22. Why is the large surface area of mycelium essential for nutrient acquisition by fungi?

23. What is the advantage for a basidiomycete to produce a showy and fleshy fruiting body?

24. For each of the four groups of perfect fungi (Chytridiomycota, Zygomycota, Ascomycota, and Basidiomycota), compare the body structure and features, and provide an example.

25. Why does protection from light actually benefit the photosynthetic partner in lichens?

26. Ambrosia bark beetles carry *Ambrosiella* fungal spores to trees, then bore holes and lay their eggs with the fungus. When the new larvae hatch, they eat the fungus that has germinated in the holes. Describe how this relationship can be classified as mutualistic.

27. Ecologists often attempt to introduce new plants to restore degraded land. In an arid climate, scientists recommend introducing plants with arbuscular mycorrhizae. How would the mycorrhizae increase the plants' survival compared to plants without mycorrhizae?

28. Why can superficial mycoses in humans lead to bacterial infections?

29. Historically, artisanal breads were produced by capturing wild yeasts from the air. Prior to the development of modern yeast strains, the production of artisanal breads was long and laborious because many batches of dough ended up being discarded. Can you explain why?

30. How would treating an area of a forest with a broad-spectrum fungicide alter the carbon and nitrogen cycles in the area?