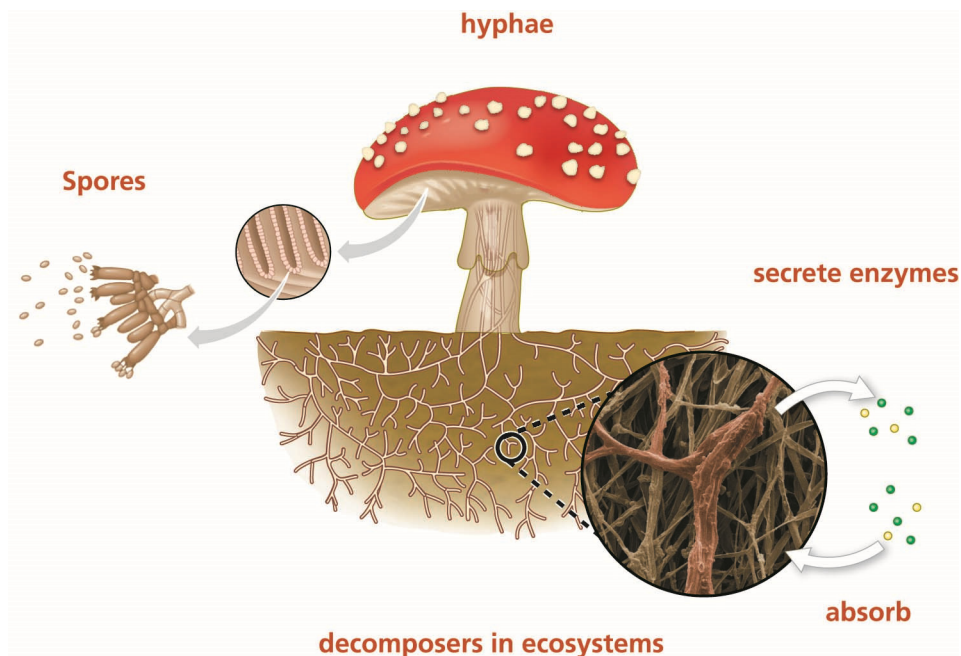


## Chapter 31: Fungi

- 31.1 Describe the structure of the fungal body.*
- 31.2 Compare and contrast sexual and asexual reproduction in fungi.*
- 31.3 Explain how fungi may have evolved from a single-celled protist.*
- 31.4 Identify and characterize major phylogenetic groups of fungi.*
- 31.5 Give examples of how fungi interact with other organisms.*

This chapter deals with a group of organisms essential for nutrient recycling. The fungi have many cellular features that are unique and fascinating. In the questions that follow, we have tried to give you some appreciation for their structure, diversity, and importance while minimizing the vocabulary and taxonomy associated with this kingdom.

**Study Tip:** The basics of fungi structure and function are shown in the introductory figure of a mushroom, Figure 31.1. Explain the roles of the five bold terms included with the figure.



**Concept 31.1** *Fungi are heterotrophs that feed by absorption*

**LO 31.1:** *Describe the structure of the fungal body.*

1. Both animals and fungi are multicellular heterotrophs, but they differ in how they obtain their nutrients. Explain how fungi bring in nutrients.
2. Fungi play three important ecological roles. Explain each.
  - a. Decomposers
  - b. Parasites
  - c. Mutualists
3. Both plants and fungi have cell walls. What material is found in the cell wall of fungi? What role does the material play for the fungus?
4. The body of a fungus consists of *hyphae*, which make up the *mycelium*. What are these?
5. Using Figure 31.3, label the cellular structures and the two types of hyphae. How are *coenocytic hyphae* formed?

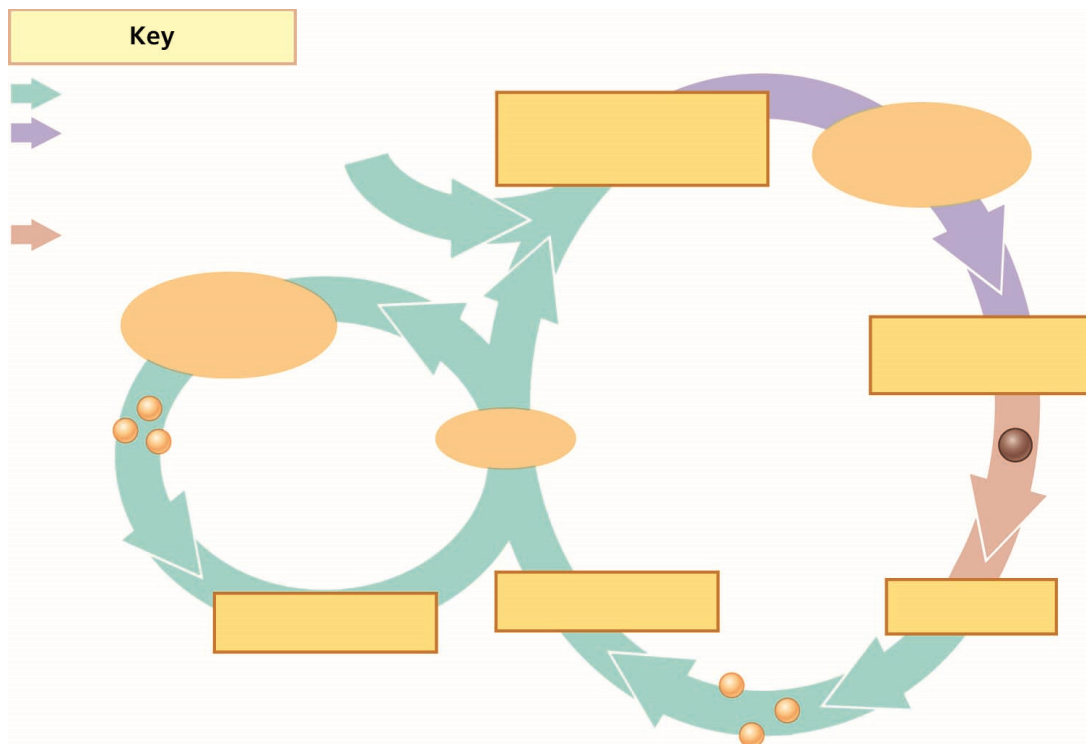


6. What are *mycorrhizae*? Discuss their importance in plant nutrition.

**Concept 31.2** *Fungi produce spores through sexual or asexual life cycles*

**LO 31.2:** *Compare and contrast sexual and asexual reproduction in fungi.*

7. *Spores* are the reproductive cells of fungi; they can be formed sexually or asexually. When two haploid mating strains are near each other, how do they signal or communicate?
  
8. Fully label the generalized life cycle of fungi. Notice the new terms that are used for cellular and genetic characteristics that we have not previously seen.



- a. What is *plasmogamy*?
  
- b. What is *karyogamy*? How rapidly does karyogamy follow plasmogamy?
  
- c. How are the spores produced by the sexual component of the fungal life cycle different from the spores produced by the asexual phase?

**Concept 31.3** *The ancestor of fungi was an aquatic, single-celled, flagellated protist*

**LO 31.3:** *Explain how fungi may have evolved from a single-celled protist.*

9. Building on the concept heading, explain the symbiotic role between plants and fungi and the move from water to land.

**Concept 31.4** *Fungi have radiated into a diverse set of lineages*

**LO 31.4:** *Identify and characterize major phylogenetic groups of fungi.*

This concept discusses many different fungi and has some wonderful photographs and figures. We will concentrate on the two groups of fungi you are most likely to encounter in nature.

**Ascomycetes**

10. What is the defining feature of the phylum *Ascomycota*?
11. What are two beneficial symbiotic relationships formed by ascomycete species?
12. Did your class study meiosis in *Sordaria*? *Sordaria* is an ascomycete. You may also remember the ascomycete *Neurospora*, which Beadle and Tatum used in their research. This group gets its name from the sac-like structures that contain their spores. Give at least three other examples of *ascomycetes*.

**Basidiomycetes**

13. What is the name of the structure where the sexual spores are produced? What is the common name of this group?
14. Give at least three examples of *basidiomycetes*.
15. Have you ever seen a “fairy ring”? Explain how they grow.

**Concept 31.5** *Fungi play key roles in nutrient cycling, ecological interactions, and human welfare*

**LO 31.5:** *Give examples of how fungi interact with other organisms.*

16. Fungi are heterotrophs and have three modes of nutrition. Explain each mode of nutrition and describe a fungus that exhibits it.

Explanation of Mode of Nutrition	Fungus Example
Decomposer	
Mutualism	
Parasitism	

17. What are *lichens*? What role do photosynthetic algae and fungi play in their symbiotic formation of lichens?

18. Tell the life stories of two of your favorite *pathogenic* fungi.

19. Describe three ways in which humans benefit from the activities of fungi.

*Test Your Understanding*, p. 672

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