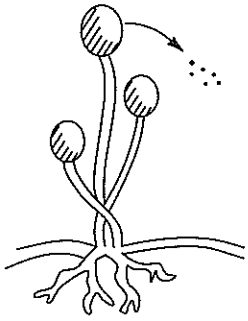
Name _____ Class _____ Date _____

Structures of Fungi

Forms of fungi can be seen almost everywhere out of doors. Some fungi are very small, and others are very large. But size cannot be used to identify a fungus. Fungi can be identified only by their reproductive structures, or fruiting bodies. The fruiting bodies of fungi are formed during the reproductive cycle of the organism. The fruiting bodies of fungi have characteristics that are specific to each species. These traits include shape, color, width, and height.

1. Label the diagram below of the mold *Rhizopus stolonifer* using the following terms: sporangiophore, stolon, rhizoid, sporangium, spores.

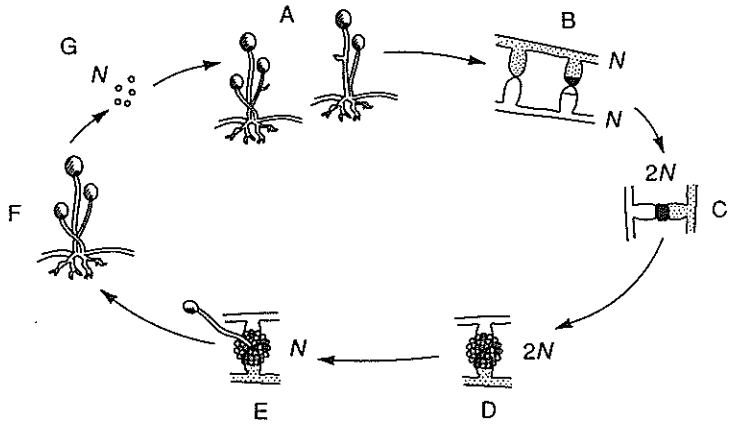


2. Briefly describe each structure. _____

_____

_____

The sexual reproductive process of *Rhizopus* is illustrated in the diagram below. Use this information to answer the questions that follow. The letters N and 2N represent monoploid and diploid nuclei respectively.



3. Which stage represents monoploid nuclei that function as gametes? _____

4. Which stage illustrates the diploid nucleus formed by the fusion of gametes? _____

5. Which structure produces monoploid spores? _____

6. Between which two stages does meiosis occur? _____ and _____

7. Which stage shows the formation of a zygospore? _____

8. Which stage shows germination of a zygospore? _____

9. *Rhizopus* reproduces both sexually and asexually. Of what adaptive value to the fungus is each reproductive process? _____

_____

Scientists who study fungi must keep accurate records of their field observations. Later, they can analyze this information and identify each organism. One way to analyze such data is to graph it for comparison. A comparison is useful to a biologist who wants to know how fungi are different from one another. A bar graph is a good way to compare these data.

The table below shows the average height of the fruiting bodies of ten species of fungi. Use this data to construct a bar graph.

Specimen	Species	Common Name	Height of Fruiting Body (centimeters)
1	*A. aurantia*	Orange-peel fungus	12
2	*C. argillacca*	Moor-club fungus	6
3	*L. lubrica*	Jellybaby	6
4	*C. vermicularis*	Field fungus	10
5	*P. vesiculosa*	Early-cup fungus	7
6	*X. hypoxylon*	Candle-snuff fungus	8
7	*L. molle*	—	5
8	*M. caninus*	Smaller-dog stinkhorn	2
9	*C. visocosa*	Stag's horn fungus	8
10	*R. flava*	Yellow-coral fungus	3

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Relationships with Fungi

Fungi are eukaryotic heterotrophs. They obtain their nourishment by absorbing organic substances. Many fungi are saprophytes. They consume the dead remains or waste products of other organisms. Some fungi, however, establish symbiotic relationships with living organisms. These relationships may be parasitic, mutualistic, or commensalistic.

Parasitism occurs when a fungus derives its nourishment while causing injury to another organism. In mutualism, both the fungus and the other organism benefit from the association. In commensalism, the relationship may be good for either organism but it is not necessary for their growth and survival.

1. Some fungi form relationships with plants. Structures known as mycorrhizae are formed, by which fungal hyphae reach into the root tissue of the plant. There is evidence that if the fungus is not present, the plants do not grow properly.

a. Design a controlled experiment that would test the hypothesis that mycorrhizae are necessary for growth. _____

_____

_____

_____

_____

_____

b. What control did you include in your experimental design? _____

_____

_____

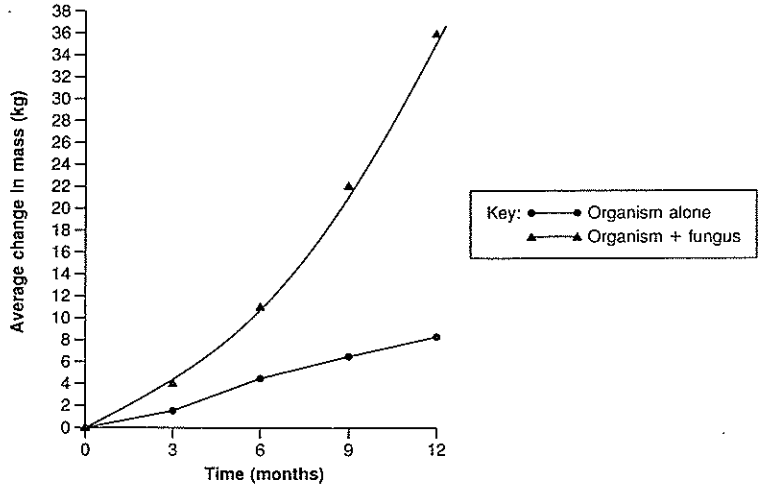
c. What was the variable in the experimental group? _____

_____

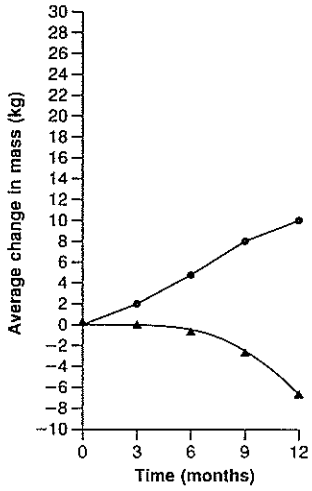
_____

2. The data in the following three graphs were collected in three different experiments. In each experiment, the growth of an organism alone was compared with the growth of that organism together with a fungus.

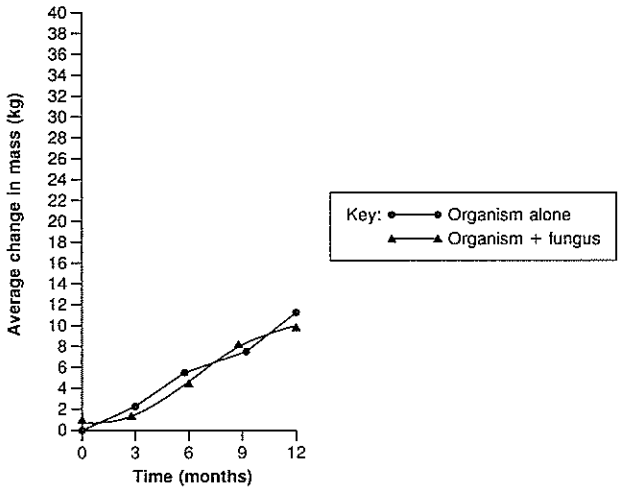
Graph A



Graph B



Graph C



a. What type of symbiotic relationship is indicated in each group? Explain your answers.

_____

_____

_____

b. Which graph above would confirm the hypothesis in question 1? _____

3. Many bacteria, like saprophytic fungi, cause decay. These bacteria compete with the fungi for food, but the fungi have evolved a competitive advantage. They secrete chemicals that kill the bacteria. People have capitalized on this evolutionary adaptation by collecting and refining these secretions and using them to kill disease-causing bacteria. These secretions are called antibiotics.

Suppose that you are a researcher trying to develop new antibiotics. Describe how you would find fungal secretions with antibiotic activity. _____

_____

_____

_____

Name _____ Class _____ Date _____

CHAPTER 19

VOCABULARY REVIEW

Fungi

Word Scramble

Fill in the blanks in the paragraphs below with the correct words by unscrambling the letters to the left of the blanks.

INFUG _____ are eukaryotic heterotrophs. Members of this group are quite diverse. Some are saprophytes, some are parasites, and some are symbionts. All of them, however, are SDREPMOEOCS _____.

The body of a typical fungus is made up of tiny AHEYHP _____ that form a thick, tangled mass called a MLYMUCIE _____. Most fungi reproduce both asexually and sexually. Asexual reproduction usually involves the production of spores inside structures called AORSIGPNA _____. Hyphae that contain these special structures are called GSPOORNPEHRAIOS _____. Sexual reproduction usually involves two different mating types that meet to form a structure called a MTAGGEUMAIN _____.

The name of each of the five phyla in this kingdom gives a clue to the characteristics of that group. The name oomycetes is derived from a specialized structure known as the MOGONOUI _____ that produces egg cells. Zygomycetes form thick-walled SEZYOROGPS _____ during sexual reproduction. The tiny reproductive sac, or SCAUS _____, is the basis for the group name ascomycetes. Basidiomycetes are named because of the spore-producing MISBAIUD _____. EEEESTTUORYDMC _____, or imperfect fungi, include those fungi that are not known to have the ability to reproduce sexually.