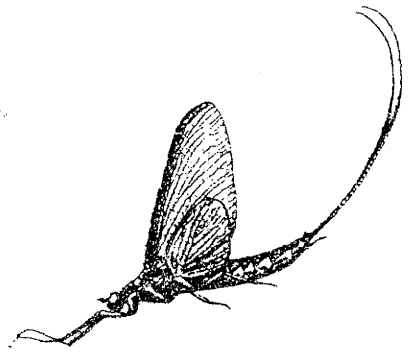
16.5 Dichotomous Key

Objective ▪ *Use a dichotomous key to identify an organism.*



▲ **Figure 16.11** Use the dichotomous key to identify this insect.

When scientists or hobbyists work in the field, they sometimes come across organisms they do not recognize. When a scientist finds such an organism, he or she uses a classification key to identify it. *A classification key, or* **dichotomous key,** *is a tool used for identifying unfamiliar organisms.*

You can easily learn to use a key to identify organisms that you find. A dichotomous key is a list of observable traits that eventually lead you to the name of the organism. The observations are presented as choices. For example, suppose you found an insect that you wished to identify. You would need to find a key for insects. Appropriate keys can often be found in public libraries. Suppose your insect looked like the one in Figure 16.11. The first set of choices in the key might read:

1a. Insect has wings .....go to 2.

1b. Insect has no wings.....go to 9.

Because your insect has wings, you go to the choices numbered 2a and 2b. If your insect had no wings, you would go to the choices numbered 9a and 9b. When you go to question 2, the next set of choices might read:

2a. Insect has two wings.....go to 3.

2b. Insect has four wings.....go to 12.

Your insect has four wings, so rather than going on to question 3, you would skip ahead to question 12. Question 12 might give the following choices:

12a. Wings are of equal size.....go to 13.

12b. Wings are of unequal size.....go to 18.

Which set of choices would you proceed to next? Eventually, you reach a choice that does not direct you to another set of choices. Instead, the key states the identity of the organism. The last question in this example might read:

18a. Long thin projections in rear.....MAYFLY.

18b. No projections in rear.....go to 21.

Because your insect does have long thin projections, your search is over, and your insect has been identified as a mayfly!

Classification organizes things by placing them into groups. Remove the contents of your book bag, purse, or pockets. Create a system for classifying the objects. How is your system similar to that used in taxonomy? How is it different?

ACTIVITY

BioProbe

1. What is a dichotomous key, and how is it used?
2. The dictionary defines *dichotomy* as a division into two parts. How does the word *dichotomy* relate to a dichotomous key?
3. **Construct** Suppose a student wanted to identify a type of book using a dichotomous key. Construct a key to reading materials that would lead the student to identify your biology text. (*Hint:* your first set of choices might be: 1a. Hard cover; and 1b. No hard cover.) Include at least five sets of questions.

Name _____ Class _____ Date _____

CHAPTER 18

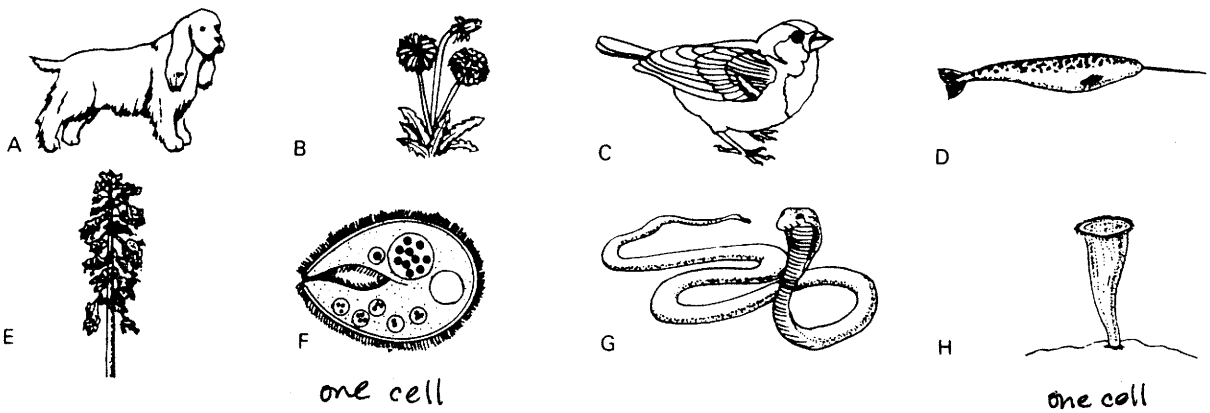
EXTENSION

Diversity and Classification

The Classification Key

A useful aid in identifying unknown organisms is the classification key. A classification key is like a map for finding the scientific name of an organism.

Study the illustrations below. Then determine the scientific and common names of each of the organisms shown by using the key that follows. For each numbered item, choose between a and b by deciding whether a or b more accurately fits the illustration. Then follow the accompanying direction. After identifying each organism, write the letter corresponding to each organism in the blank at the right.



1a. organism with two or four functional legs .... go to **2**
1b. organism without two or four legs ..... go to **3**

2a. organism without wings ..... *Canis familiaris* ..... dog _____

2b. organism with wings ..... *Passer domesticus* ..... house sparrow _____
3a. organism is unicellular ..... go to **4**
3b. organism is multicellular ..... go to **5**

4a. organism swims freely in water ..... *Balantidium* sp. ..... balantidium _____

4b. organism anchored to substrate ..... *Stentor* sp. ..... stentor _____
5a. organism is heterotrophic ..... go to **6**
5b. organism is autotrophic ..... go to **7**

6a. organism lives in oceans ..... *Monodon monoceros* ..... narwhal _____

6b. organism lives on land ..... *Ophiophagus hannah* ..... king cobra _____

7a. organism is a tree ..... *Pinus ponderosa* ..... ponderosa pine _____

7b. organism is an herb ..... *Taraxicum officinale* ..... dandelion _____