Chapter 17

Communities

17.2 Competition

Competition between organisms of different species within a community is called **interspecific competition**. Some instances of interspecific competition are easy to identify—such as when animals battle over food (Figure 16.12). However, living things don't have to fight each other directly in order to compete. In fact, species within a community compete any time they use the same resource and this resource exists in limited supply. For example, plants growing near each other may compete for limited resources such as sunlight, water, and soil nutrients.

FIGURE 17.4

An eagle and a stork fight over food.

A species' **niche** within a community is the total set of biotic and abiotic resources it uses. This includes the food it eats, the water it drinks, the space it occupies, and any other resource the species uses. So, you can say that two species in a community compete any time their niches overlap.

What is the result of competition? One result of interspecific competition is evolution. Many organisms have evolved adaptations that enable them to better compete with other species.

For example, some plants that compete for sunlight have evolved large leaves with a large surface area. Others have evolved to grow upward quickly, so that they have a better chance of overshadowing their competitors. Certain plants even release special chemicals that prevent a competitor's seeds from sprouting.

It is interesting that, although species frequently compete, no two species in a community can have *exactly* the same niche. Otherwise, the species that is better at acquiring and using resources outcompetes the other species and eventually drives it to extinction. Nonetheless, ecologists have sometimes found species that appear to have identical niches within a community. On closer inspection, however, it has turned out that the niches are not exactly identical.

One of the most famous instances of this occurred in a group of birds now known as MacArthur's warblers. Ecologist Robert MacArthur studied five warbler species living in the coniferous forests of the Northeast United States. All five species lived in the same trees, and all five species ate insects. Did they share the same niche? By watching the warblers closely, MacArthur discovered that there were crucial differences in how the species used resources: Each species of warbler used a different part of the tree, and each had a different way of hunting for insects (Figure 16.13). How did MacArthur's warblers come to have such similar, yet nonidentical, niches? Ecologists believe that the niche differences were produced by evolution through natural selection. Individuals of each warbler species were more successful at surviving and reproducing if they competed less with individuals of other species. Over time, this caused the species' niches to diverge.

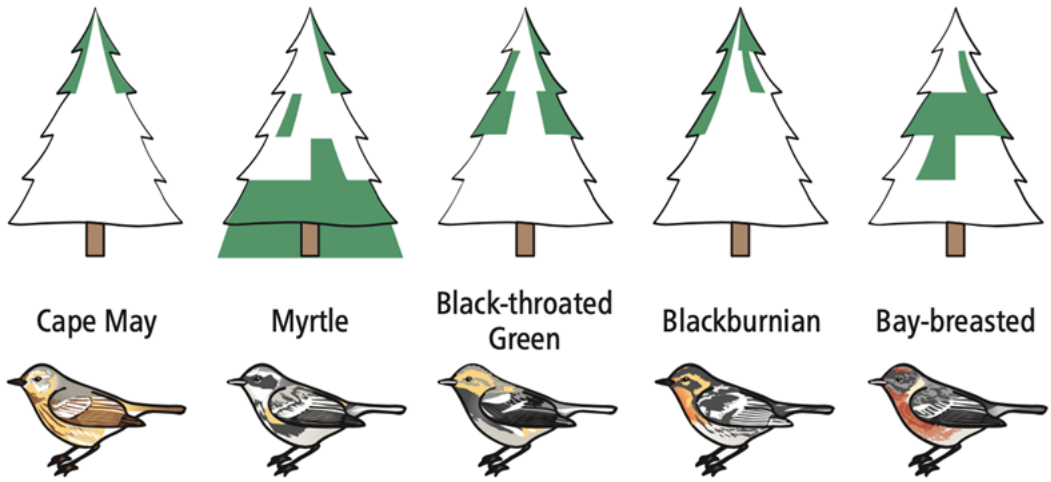

FIGURE 17.5

The five species of MacArthur's warblers initially appeared to occupy the same niche—they all live in the same coniferous forests, and they all eat insects. However, closer inspection revealed that their use of resources differs in significant ways. For example, each species occupies a different part of the tree, as shown here (shaded in green). Each species also has a different way of hunting for insects.

READING CHECK

Does interspecific competition involve members of different species directly fighting over food and other resources?

CHECK YOUR ANSWER

It can, but it doesn't have to. Any time two species within a community use the same resource, and this resource is limited, there is competition.

You can read more about interspecific competition here:

https://bio.libretexts.org/Bookshelves/Introductory_and_General_Biology/Book%3A_Introductory_Biology_(CK-12)/06%3A_Ecology/6.15%3A_Competition