V
Arthropods

Arthropods influence humans’ well-being not only because the arthropods are hosts of parasitic organisms and vectors of a wide variety of pathogens but they directly cause tissue damage and disease. They affect human health as well by reducing the availability of food. Insects destroy an estimated 20% of all food crops, and this destruction continues despite the increasing use of pesticides in fields and storage areas. Livestock are also affected by arthropod-borne infections. Vast areas of Africa are short of protein foods because cattle suffer a number of vector-borne diseases, including trypanosomiasis transmitted by tsetse flies and a variety of tick-transmitted diseases.

Although the pathogenic effects of arthropods are most pronounced in the tropics, they are by no means negligible in the United States and other temperate areas. Lyme disease, transmitted by ticks, has rapidly spread throughout the United States.1,2 Aedes albopictus, the Asian tiger mosquito, has been introduced in shipments of used automobile tires into the southern United States and has spread as far north as central Ohio, Indiana, and Illinois; moreover the introduced strain of the mosquito apparently can overwinter in the egg stage in temperate climates.3 Ae. albopictus can be an efficient vector of dengue.

Although fear has been expressed that blood-feeding arthropods, especially mosquitoes, could transmit the AIDS virus, no evidence implicating arthropods has been presented. On the contrary, epidemiologic evidence, most impressive in Africa, does not support the hypothesis that the AIDS virus can be transmitted by arthropods.4

Even as arthropods cause problems for humans and livestock, they are also beneficial as pollinators, producers of honey, natural regulators of harmful insects, and essential members of food chains. Indiscriminate destruction of arthropods in programs designed to control pests can result in serious modification of the environment with deleterious consequences far worse than the original problem.

The phylum Arthropoda contains an enormous diversity of members, with the number of species exceeding that of all other phyla combined. The arthropods share a number of characteristics that distinguish them from all other animal groups, although some of these features are absent in a particular species or group at some period of development. Nevertheless, all species in the phylum are identifiable. Among the morphologic characteristics are bilateral symmetry, a hard exoskeleton, segmented body, and paired, jointed appendages. The term arthropod, derived from Greek, means jointed foot.

Growth by metamorphosis is another characteristic of the arthropods. In some groups growth is gradual; each change from one stage to the next one is known as a molt and gives rise to a stage somewhat larger but morphologically similar to its predecessor. Among the spiders, eight or nine immature stages may precede the final molt to the sexually mature adult.

References