

Chapter 27 Worms and Mollusks**Summary****27-1 Flatworms**

The phylum Platyhelminthes consists of the flatworms. Flatworms are soft, flattened worms that have tissues and internal organ systems. They are the simplest animals to have three embryonic germ layers, bilateral symmetry, and cephalization. Flatworms are known as acoelomates, which means that there is no coelom between the tissues of flatworms. A coelom is a fluid-filled body cavity that is lined with tissue derived from mesoderm.

All flatworms rely on diffusion for some essential body functions, such as respiration, excretion, and circulation. Flatworms have a digestive cavity with a single opening, or mouth. Near the mouth is a muscular tube called a pharynx that pumps food into the digestive cavity. In free-living flatworms, several ganglia, or groups of nerve cells, control the nervous system. Many free-living flatworms have eyespots that detect changes in light. Asexual reproduction in free-living flatworms takes place by fission, in which an organism splits in two.

Turbellarians are free-living flatworms. Most live in marine or fresh water. Flukes are parasitic flatworms. Most flukes infect the internal organs of their hosts. Flukes reproduce sexually in the primary host and reproduce asexually in the intermediate host. Tapeworms are long, flat, parasitic worms that are adapted to life inside the intestines of their hosts.

27-2 Roundworms

The phylum Nematoda consists of the roundworms. Roundworms are slender, unsegmented worms. Most species are free-living. Roundworms have a body cavity between the endoderm and mesoderm tissues. This body cavity is called a pseudocoelom, because it is only partially lined with mesoderm tissue. Roundworms have a digestive tract with two openings—a mouth and an anus.

Roundworms depend on diffusion for respiration, circulation, and excretion. In roundworms, the muscles and fluid in the pseudocoelom function as a hydrostatic skeleton. Roundworms reproduce sexually by internal fertilization.

Parasitic roundworms include trichinois-causing worms, filarial worms, ascarid worms, and hookworms. Trichinosis is a terrible disease caused by the roundworm *Trichinella*. Adult worms live and mate in the intestines of their hosts, including humans and pigs. *Trichinella* larvae form cysts. The roundworm completes its life cycle only when another animal eats muscle tissue containing these cysts. Filarial worms are transmitted from host to host through biting insects. Ascarid worms are serious parasites of humans and other animals. Hookworms infect one quarter of the people in the world.

27-3 Annelids

The phylum Annelida consists of earthworms and other annelids. The body of an annelid is divided into segments that are separated by septa, which are internal walls. Most segments are similar to one another. Some segments may be modified to perform special functions, including segments with eyes or antennae. In many annelids, bristles called setae are attached to each segment. Annelids are worms with segmented bodies. They have a true coelom that is lined with tissue derived from mesoderm.

Annelids have complex organ systems. Many annelids get their food using a pharynx. In earthworms, food moves through the crop, where it can be stored. Then food moves through the gizzard, where it is ground into smaller pieces. Annelids typically have a closed circulatory system, in which blood is contained in a network of blood vessels.

Aquatic annelids often breathe through gills. A gill is an organ specialized for the exchange of gases underwater. Most annelids reproduce sexually. Some annelids, including earthworms, are hermaphroditic. When eggs are ready to be fertilized, a clitellum—a band of thickened segments—secretes a mucus ring in which fertilization takes place.

The oligochaetes—class Oligochaeta—are annelids that typically have streamlined bodies and relatively few setae. Most oligochaetes, including earthworms, live in soil or fresh water. The class Hirudinea includes the leeches. Leeches are typically external parasites that suck the blood and body fluids of their hosts. The polychaetes—class Polychaeta—are marine annelids that have paired, paddlelike appendages tipped with setae.

Earthworms mix and aerate soil. Their tunnels provide passageways for plants. Their feces enrich the soil.

27-4 Mollusks

Mollusks—phylum Mollusca—are soft-bodied animals that usually have an internal or external shell. Many mollusks share similar developmental stages. Many aquatic mollusks have a free-swimming larval stage called a trochophore.

The body plan of most mollusks has four parts. The muscular foot is used for crawling, burrowing, or catching prey. The mantle is a thin layer of tissue that covers most of the mollusk's body. The shell is made by glands in the mantle that secrete calcium carbonate (limestone). Just beneath the mantle is the visceral mass, which consists of the internal organs. Mollusks can be herbivores, carnivores, filter feeders, detritivores, or parasites. Snails and slugs feed using a flexible, tongue-shaped structure called a radula. Mollusks have an open circulatory system, in which blood is pumped through vessels and through sinuses.

There are three major classes of mollusks. The gastropods—class Gastropoda—include pond snails, land slugs, and nudibranchs. Gastropods are shell-less or single-shelled mollusks that move by using a muscular foot located on the ventral (lower) side. The bivalves—class Bivalvia—include clams, oysters, mussels, and scallops. Bivalves have two shells that are held together by one of two powerful muscles. Cephalopods—class Cephalopoda—include octopi, squids, cuttlefishes, and nautilus. Cephalopods are typically soft-bodied mollusks in which the head is attached to a single foot. The foot is divided into tentacles. Most cephalopods have only small internal shells or no shells at all. Cephalopods have numerous complex sense organs.