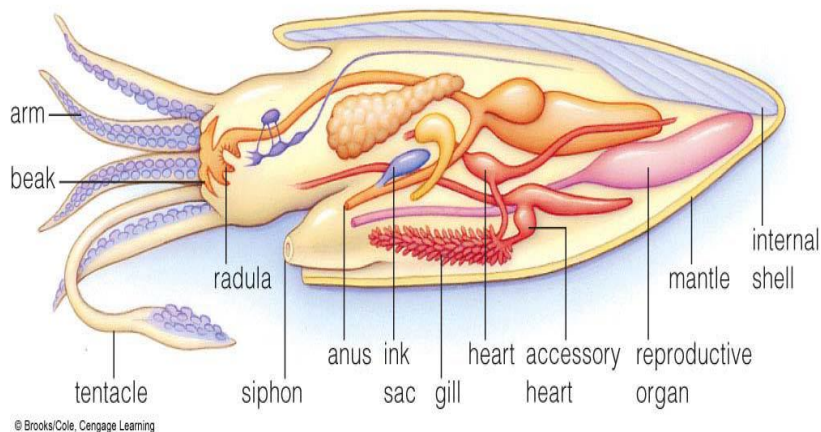


Lecture 27

Cephalopoda and Arthropoda

Phylum Cephalopoda

The cephalopods are considered to be the most highly advanced of the molluscs. All are marine, and the foot is modified to form a series of tentacles and a head. In some the shell is external, but in the most familiar cephalopods the shell is internal or absent. Cephalopods have very prominent and sophisticated eyes, which are remarkably similar to those of vertebrates. Include the fastest (squids), biggest (giant squid), and smartest (octopuses) invertebrates.

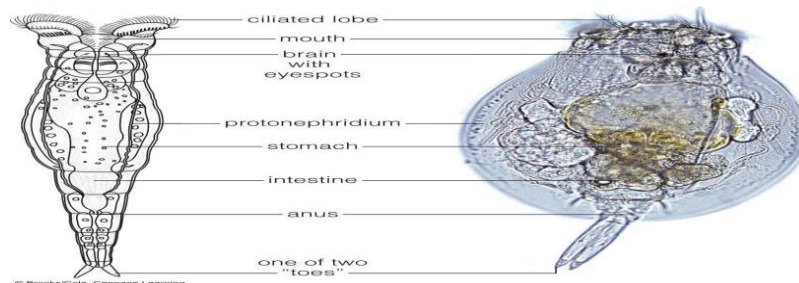


A Cephalopod's Body Plan

Rotifers and Tardigrades

Rotifers

Rotifers (phylum rotifera) live in fresh water and in damp land habitats. Most are less than one millimeter long. The group name is Latin for wheel bearer. It refers to the constantly moving cilia to the head, which direct food to the mouth and look like turning wheels. These are excretory organs (protonephridia) and a complete digestive system but no circulatory or respiratory organ.



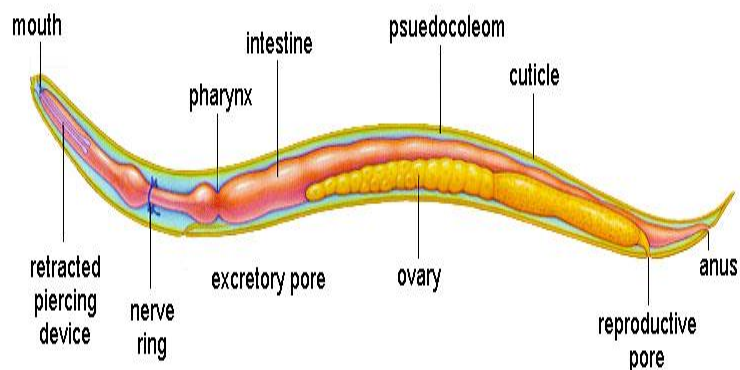
Tardigrades

Tardigrades (phylum Tardigrada) are similarly tiny animals that often live beside rotifers in damped moss and temporary ponds. Commonly called water bears they waddle about on four pairs of stubby legs. Tardigrada means slow walker. Most suck juices from plant and algae. Some including is in predators. They eat roundworms, rotifers and one another.



Phylum Nematoda

Phylum Nematoda consists of the nematodes, or roundworms. They are unsegmented, pseudocoelomate worms with a secreted cuticle that is molted. Nematodes were once classified with a very large and heterogeneous cluster of animals grouped together on the basis of their overall worm-like appearance, simple structure of an internal body cavity called a pseudocoelom, and the lack of features such as cilia and a well-defined head that are found in most animals.



Phylum Arthropoda

1. Arthropods

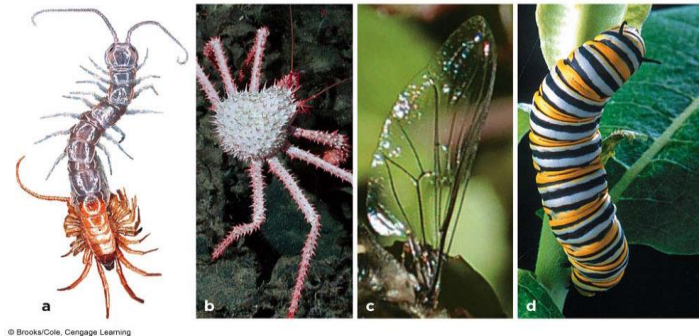
Arthropod, any member of the phylum Arthropoda, the largest phylum in the animal kingdom, which includes such familiar forms as lobsters, crabs, spiders, mites, insects, centipedes, and millipedes. About 84 percent of all known species of animals are members of this phylum. Arthropods are represented in every habitat on Earth and show a great variety of adaptations. Several types live in aquatic environments, and others reside in terrestrial ones; some groups are even adapted for flight.

Arthropod Characteristics

1. They possess a chitinous exoskeleton that must be shed during growth.
2. The paired appendages (e.g., legs, antennae) are jointed.
3. The segmented bodies are arranged into regions, called tagmata (e.g., head, thorax, and abdomen)
4. They have bilateral symmetry.
5. The nervous system is ventral (belly) and the circulatory system is open and dorsal (back).

Arthropod Adaptations

Arthropods have many adaptations that allow it to survive in their environment. The first adaptation is that the arthropods have an outer body covering called an exoskeleton. The exoskeleton is made of a special material called chitin. This material is hard and thick so it protects it from predators. Another adaptation arthropods have is that they have special mouth parts. A mosquito (arthropod) has a special mouth which allows it to break through humans skin and suck our blood. The next adaptations arthropods have are their jointed legs. These jointed legs help them so much. With them they can move really fast because their legs are flexible, or jointed, so they can get away from prey or catch prey.



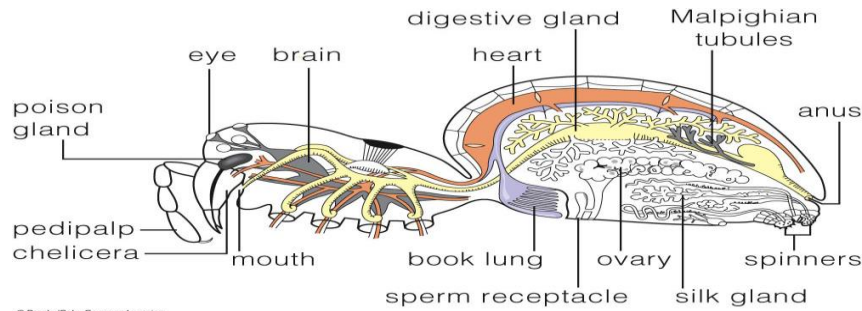
Chelicerates

The subphylum Chelicerates is one of the five subdivisions of the phylum Arthropoda, with members characterized by the absence of antennae and mandibles (jaws) and the presence of chelicerae (a pincer-like mouthpart as the anterior appendage, composed of a base segment and a fang portion). Extant Chelicerates include spiders, scorpions, ticks, and mites (class Arachnida), horseshoe crabs (class Xiphosura or Merostomata), and sea spiders (class Pycnogonida).

The Spiders

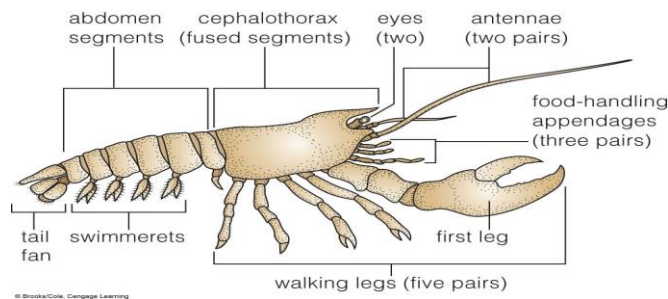
Spiders are predatory, invertebrate animals with two body segments, eight legs, no chewing mouth parts, and no wings. All spiders produce silk, a thin, strong protein strand extruded by the spider from spinnerets most commonly found on the end of the abdomen. Many species use it to trap insects in webs, although there are many species that hunt freely.

Body plan of spider



Crustaceans

Crustaceans form a very large group of arthropods, usually treated as a subphylum, which includes such familiar animals as crabs, lobsters, crayfish, shrimp, krill and barnacles. Like other arthropods, crustaceans have an exoskeleton, which they moult to grow. They are distinguished from other groups of arthropods, such as insects, myriapods and chelicerates by the possession of biramous (two-parted) limbs, and by their larval forms, such as the nauplius stage of branchiopods and copepods.



Myriapods

Myriapods (Myriapoda) are a group of arthropods that includes millipedes, centipedes, pauropods, and symphylans. There are about 15,000 species of myriapods alive today. As their name implies, myriapods are noted for their having many legs. The number of legs a myriapod has varies from species to species and there is a wide range. Some species have fewer than a dozen legs, while others have many hundreds of legs.

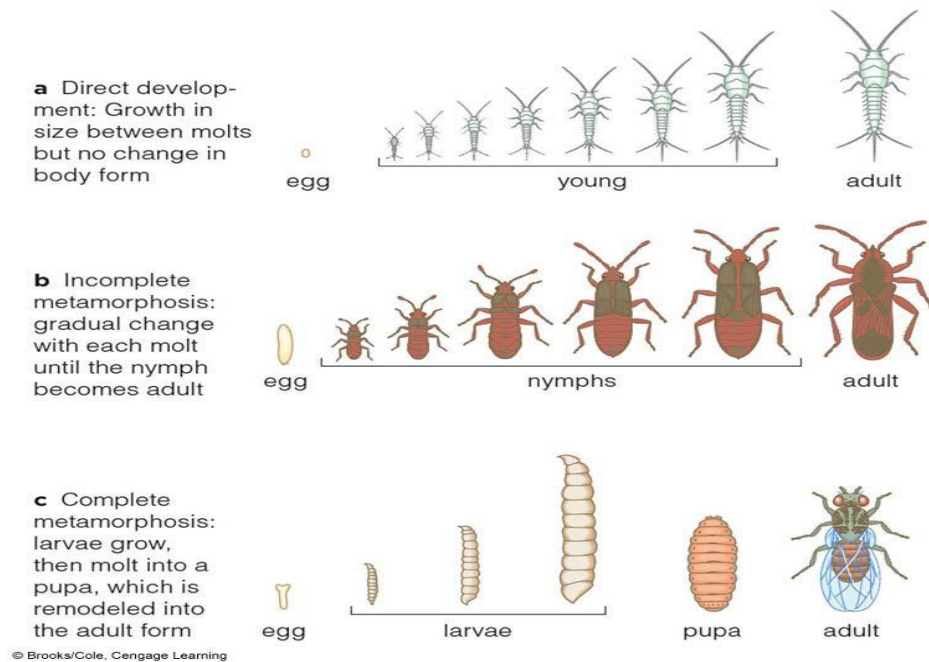
The Insects

Insects are a class of invertebrates within the arthropod phylum that have a chitinous exoskeleton, a three-part body (head, thorax and abdomen), three pairs of jointed legs, compound eyes and one pair of antennae. They are the most diverse group of animals on the planet, including more than a million described species and representing more than half of all known living organisms.

Insects are Most Successful Animals

Insects are most numerous & successful creatures on Earth. Their species richness or diversity surpasses any other group of organisms. Throughout the insect evolution, several factors have combined to make insects the most successful of all species on this planet. There are several reasons for their success, mainly their ability to fly and reproduce quickly, their generally small size, and their protective cuticle (external exoskeleton), their insulated central nervous system and their unusual wing folding mechanism. Development may be direct, or through incomplete or complete metamorphosis.

Insect Development



Ref:

http://bio.rutgers.edu/~gb102/lab_2/307em-cephalo.html
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