

Aquatic Organisms

Aquatic organisms are incredibly diverse. The following information is designed to give you a brief overview of some of the major groups of organisms that you would find in aquatic, either marine (saltwater) or freshwater, ecosystems. It is not inclusive and, for the most part, uses common names for these organisms.

All living things are divided into large groups called Kingdoms. You are probably familiar with the plant kingdom and animal kingdom, for example. Each kingdom is further divided into groups called **phyla** for animals (phylum is the singular) and **divisions** for plants. Phylum or division is further divided into class, order, family, genus, and species.

The major kingdoms in most systems of classification are the following:

Monera

These are simple, single-celled or colonial forms that do not have a membrane-bounded nucleus (prokaryotic). Important organisms in this group are the bacteria and the blue green bacteria (formerly known as the blue green algae).

Protista

Organisms in this kingdom are also single-celled or colonial but they have a distinct nucleus (Eukaryotic). Some of the organisms in this kingdom are plant-like (they carry out photosynthesis). We call these organisms algae. Diatoms are an example of an alga that is important in aquatic systems. Other organisms in this kingdom are more animal-like. We call these organisms protozoans. Different types of protozoans have different forms of locomotion. Some protozoans (ciliates) have cilia (small hair-like structures); others (flagellates) move by pseudopods -- the whole cell flows in the direction of movement.

Fungi

Fungi are unique organisms that are parasites or saprophytes (feed on dead organic matter). They may be single-celled or colonial, but most are multicellular (composed of many cells which have become specialized to carry out different functions within the organism). Most aquatic fungi are small and look like a mass of threads. Mushrooms are a type of fungus with which you are familiar.

Plant

Almost all plants are photosynthetic autotrophs (they are able to make their own food). Most plants are multicellular although a few algae are included within this group, some of which are single-celled or colonial. The green algae are important in both fresh water and marine systems. The red algae and brown algae are large algae that are almost exclusively marine. Other plants that are found in aquatic situations are small plants like mosses and flowering plants such as water lilies and cattails.

Animal

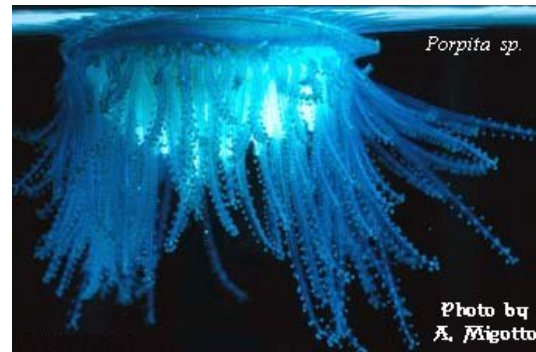
This kingdom consists of multi-cellular organisms that cannot make their own food and depend directly or indirectly on plants. Most animals have fairly complex structure with specialized systems for movement, digestion, etc. Most also have nervous systems to help coordinate the organisms activities. Animals tend to be divided into two basic types- vertebrates (animals with backbones) and invertebrates (those without).

Phyla of invertebrates



Sponges (*Phylum porifera*)

These are simple organisms which consist of an outer layer of cells and an inner layer which surrounds a network of internal pores and canals. These organisms are sessile (attached to the substrate and do not move). Most are marine, although there are freshwater sponges. Freshwater sponges don't look like typical animals-most appear as a mass of cells attached to sticks or other structures in the water.



Hydra, Jellyfish, and Sea Anemones (*Phylum cnidaria*)

These are simple organisms that float in the water (jellyfish types) or move slowly along a substrate (hydras and sea anemones). The majority of *cnidaria* are marine.

They capture small organisms with their tentacles, which surround their mouths.

Corals are also members of this group.



Planarians (*Phylum platyhelminthes*)

Planarians are flatworms. They are common in freshwater. They are small, usually dark brown or black, arrow-shaped organisms that glide along the undersurface of rocks by means of cilia on their lower surfaces. They have an esophagus and mouth on the middle of their undersides. They capture and consume small aquatic organisms.



Segmented Worms and Leeches (*Phylum annelida*)

You are familiar with earthworms. You may find earthworms near the edges of streams or ponds. There are also aquatic species, including many marine forms. They typically have a long worm-like body which is divided into segments (block-like sections). The marine forms often have broad paddle-like extensions on each segment to help them absorb oxygen. Leeches are annelids that are external parasites. They attach to fish or other organisms and bite through the outer layers of cells to absorb blood and fluids from the host organism.



Snails, Clams, and Oysters (*Phylum mollusca*)

Many of the organisms of this group have distinctive hard calcareous shells which cover and protect them. Some are sessile; others move slowly along surfaces or burrow into the bottom substrate. Some mollusks such as slugs, octopus and squid do not have external shells.



Insects and Crustaceans (*Phylum arthropoda*)

Organisms in this group have jointed legs and other appendages, and they have hard jointed outer skeletons called exoskeletons. In freshwater systems, two of the most common arthropods are insects and crustaceans. Insects typically have six legs although some of the larval forms don't have any legs. Think of the caterpillars (larvae of butterflies), for example. Many insects are aquatic in their juvenile stages (larvae or nymphs), but emerge to form winged adults that can fly. Some insects continue to live in water as adults.

Some crustaceans are quite small, almost microscopic. Common types include cladocerans like daphnia which have clear shells or coverings that are not segmented. You can see the internal organs through the exoskeleton. Another small crustacean is the copepod. These organisms generally have two antennae and segmented bodies that end in a forked tail. Ostracods are small crustaceans that are enclosed in a hinged shell (they look like tiny clams).

Larger crustaceans (easily seen without magnification) include amphipods such as Gammarus and isopods such as Asellus, which you should see in many streams. Crayfish, shrimp, and lobsters are other large crustaceans. Crustaceans usually have more than six legs. Insects are not common in marine environments but you will see lots of crustaceans.



Rotifers (*Phylum rotifera*)

These groups of animals are microscopic- about the size of the protozoans, but are multicellular. They vary in shape from worm-like to ovals that have a transparent cuticle or outer covering. Rotifers have a crown of cilia at the anterior end. When they feed, you can see one or more circles of cilia beating to create a current which collects small cells and particles on which the rotifer feeds. Rotifers usually have a small forked tail. Some are found at the bottoms of ponds and lakes; others swim or float in the water.

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