

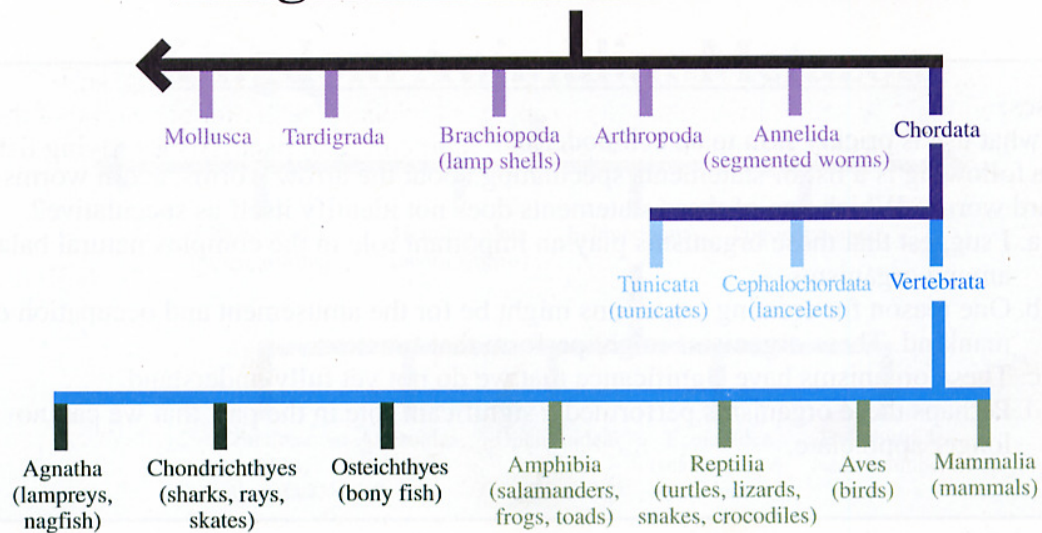
23: Fishlike Animals with Cords

Now we are left with only the “highest” forms of life—the **chordates** (in the phylum Chordata). At one time or another during its life, every chordate has a **nerve cord** down its back. In humans it



Tunicates have nerve cords without backbones.

Kingdom Animalia: Metazoa





These are the Chondrichthyes or cartilaginous fish (fish with only cartilage rather than bones). The one on the left is a shark and the one on the right is an Atlantic Manta Ray.

develops into the **spinal cord**. Other chordates do not have a nerve cord so well developed as the human spinal cord, but they all have one. Two simple chordates do not have a bony **spine** (or backbone), but do have a nerve cord. These animals, called **protochordates**, are the tunicates and the lancelets.

From the protochordates we move on to the true **vertebrate** chordates, that is, chordates that have **vertebrae**, or backbones. From this point on we consider only animals that have a bony spine to protect their spinal cord. While you met many unfamiliar animals during our study of **invertebrates**, or animals without backbones, you will easily recognize most of the classifications of vertebrates.

The first group is the **fish** or fishlike organisms. These include the hagfishes and lampreys that can attach themselves to the side of a fish, wear a hole in its flesh and suck out its insides. (Yum, yum!) They also include the sharks, skates and chimaeras that look a lot like fish, but have no real bones. Instead they have only **cartilage**—soft, flexible bone-like structures.

Apart from a class of now extinct fishlike vertebrates, there remains only one class of fishlike animals, and that's the **bony fish**. Many of these are the ones you go fishing for: herring, salmon, pike, catfish, codfish, perch, sunfish, bluegills, crappie, sticklebacks and mullets. Some of these you don't go fishing for: garfish, sheepheads, various eels, sturgeons and paddlefishes, flying fishes and puffer fishes.

Exercises:

True or false?

1. All chordates have a spine.
2. All chordates have bones.
3. All fish are vertebrates.
4. Sharks have bones.
5. Protochordates are vertebrates.

BIOLOGY

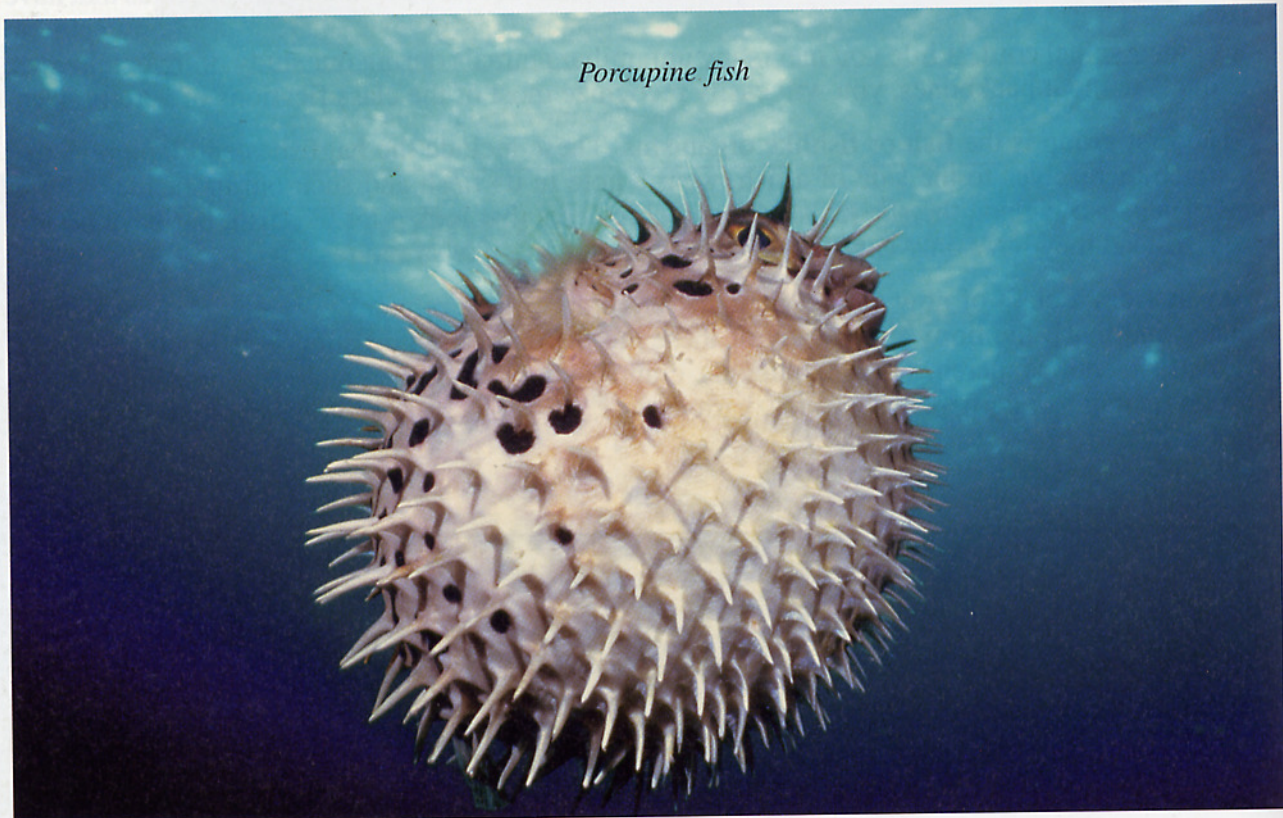
These are all bony fish. Some have basically the same body shape while others (the eel and the sea horse, for example) are vastly different. What they all have in common are their body parts: scales, fins, gills and the hard bones that separate them from the cartilaginous fish, for example.



Sea horse



Flying gurnard



Porcupine fish