

Perch Dissection Lab Guide

SNC 2D1

Background Information

Fish are the largest group of vertebrates found in fresh and salt water. In fact, over 25,000 species of fish comprise about 50% of the vertebrate population. Part of the reason for the large numbers of fish is due to how well adapted they are to life in an aquatic environment. In this laboratory you will observe the internal and external structures of a perch, a typical bony fish. You will see how its structures make it ideally suited to living in an aquatic environment.

Problem

How are the structures of the perch adapted to life in the water?

Materials (per group)

- Preserved Grey perch: *Perca flavescens*
- One dissecting kit including
 - 1 forceps
 - 1 scissors
 - 2 sharp probes
- Dissecting pan
- Hand lens
- Dissecting microscope (optional)

Classification

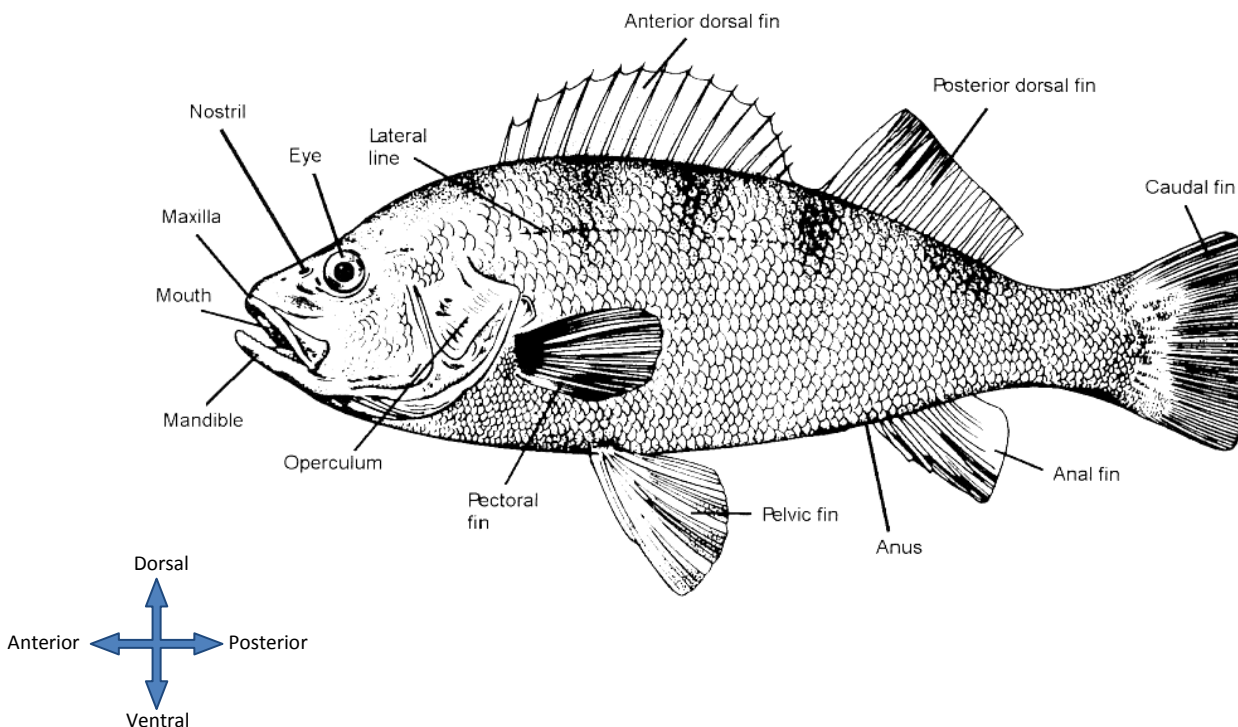
Kingdom: Animalia
Phylum: Chordata
Subphylum: Vertebrata
Class: Actinopterygii
Order: Perciformes
Suborder: Percoidei
Family: Percidae
Genus: *Perca*
Species: *flavescens*

Procedure

Part A: Observing the Fish's External Anatomy

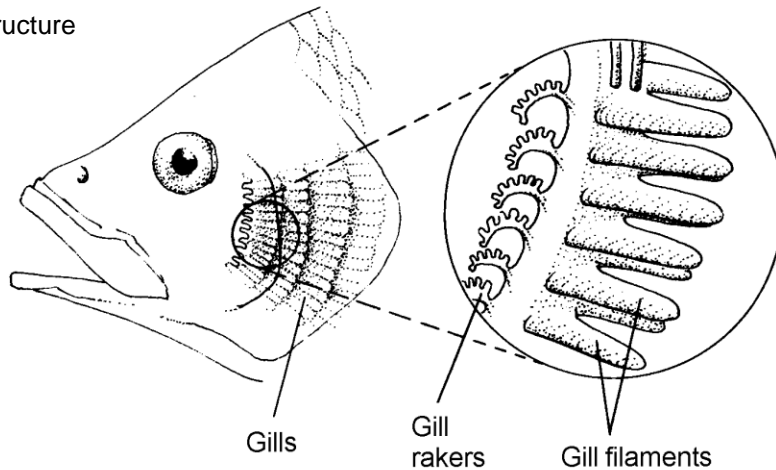
1. Ensure each group member is wearing an apron and goggles properly.
2. Obtain one pair of vinyl gloves per group member.
3. Place the fish in the dissecting pan.
4. Immediately wash the perch in the sink to remove as much preservative fluid as possible.
5. Locate all the external structures as shown in Figure 1 on your specimen and then answer the questions in Observations.

Figure 1



- Open and close the perch's mouth to observe the action of the *mandible* and *maxilla*. Examine the *teeth*. Note the appearance of the teeth and the direction that the teeth point.
- Explore the inside of the *nostrils* with the probe.
- Place your probe in the fish's mouth and gently push it out from under the *operculum*. You should notice several *gill arches*, as shown in the enlarged circle in Figure 2.
- Remove one gill arch by cutting its dorsal and ventral attachment. Place it in a small beaker of water and examine it with a hand lens or a dissecting microscope. Look for the thin delicate structures called *gill filaments*. These filaments are filled with *capillaries* that carry blood from the heart.

Figure 2: Gill Structure

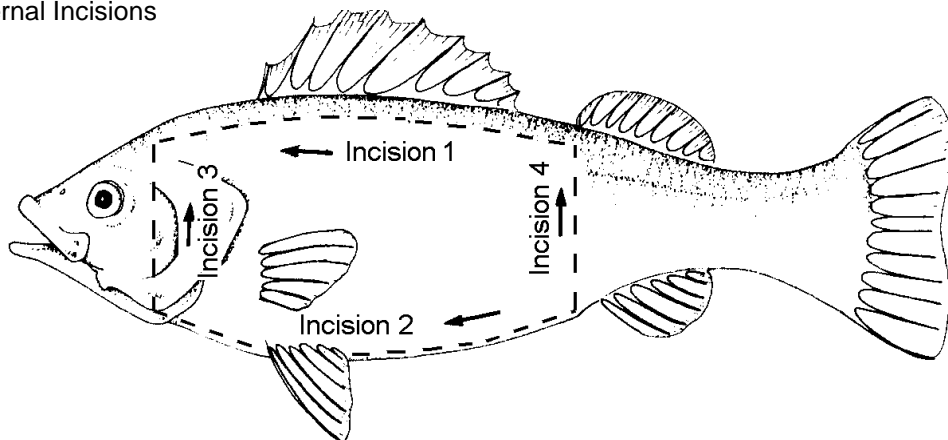


- Locate the *gill rakers* on each gill arch. These projections separate the gill arches from each other and create spaces between each of the gill arches. Notice how the *gill rakers* project inside the fish's mouth.

Part B: Observing the Fish's Internal Anatomy

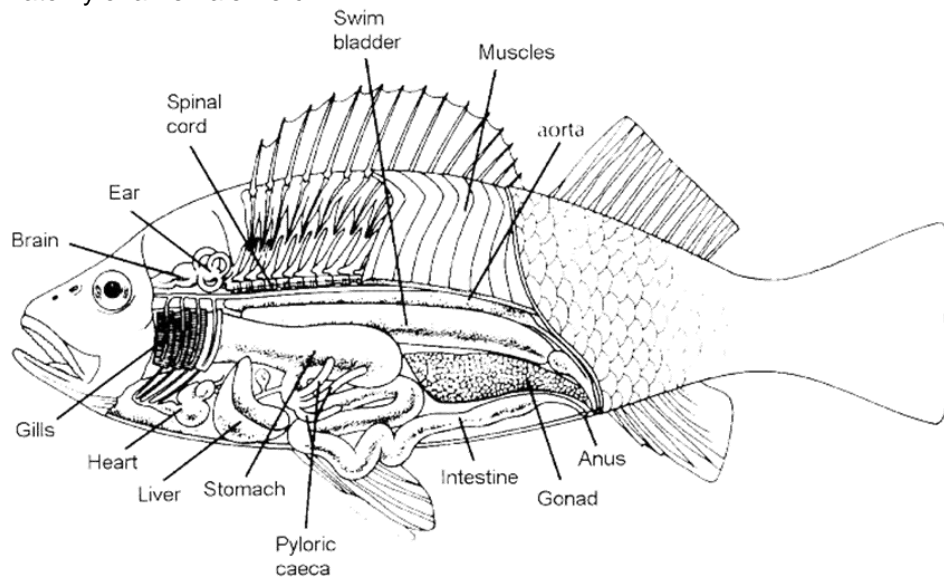
- Figure 3 shows the incisions to be made for viewing the internal structures of the perch. Begin the incision along the dorsal side of the fish no higher than the lateral line. Most of the organs reside in the ventral half of the fish's body. Be careful not to cut too deeply, you might destroy some of the internal organs.
- Use your scissors and make the incision toward the head, as shown in the diagram.
- Incision 2 should begin on the ventral surface just forward of the anus. When you reach the gills, cut upward behind the gills. This will complete incision 3.
- Lastly, finish this process by making incision 4 as shown in Figure 3. Very carefully, lift away the cut section of the body wall. Use your scissors to remove any membranes that adhere to the body wall. If the body organs are covered with fat, you may use a forceps to remove this material.

Figure 3: External Incisions



5. Refer to Figure 4 to aid in locating the fish's internal organs.

Figure 4: Internal Anatomy of a Female Perch



6. **Digestive System:** Find the tan-colored liver with the gallbladder attached to and underneath the liver. Cut the liver free from the body to expose the esophagus and stomach. Then, trace the route a piece of food would travel as it passes through the fish's digestive system. Find the mouth, pharynx, esophagus, pyloric caeca (blind ended sacs), stomach, intestine, and anus. To aid in locating other organs, remove the entire digestive canal by cutting it free at the anus and at the mouth.
7. **Reproductive System** - Determine if your fish is a male or female by locating either a pair of *testes*, small, pale yellow masses on the ventral side or a single, large, yellow *ovary* filled with eggs. The testes and ovaries are connected by tubes to the *urogenital opening* found posterior to the anus. Check around the classroom with other groups to ensure you observe both a male and a female perch.
8. **Respiratory and Excretory Systems** - Locate and remove the bright white, gas-filled swim bladder in the dorsal portion of the fish. On the dorsal wall of the body cavity locate the kidneys. The kidneys are connected by urinary ducts to a urinary bladder from which wastes pass out of the body through the urogenital opening.
9. **Circulatory System** - Cut through the fish's body wall anterior to where the liver was located. Doing this exposes a cavity where the heart is suspended. Find the one thin-walled atrium and the one thicker-walled muscular ventricle. You may be able to locate the one enlarged vein (sinus venosus) where blood enters the heart and the one enlarged artery (bulbus arteriosus) where the blood leaves the heart. The blood leaving the heart goes to the gills where it flows through capillaries in the gills and then throughout the body in various veins and capillaries and arteries and finally returns to the heart to be pumped throughout the body again.

Part C: Clean Up and Disposal

1. Once your group has finished observing and identifying the structures of the perch, it must be disposed of safely. If there are any excess fluids in your dissecting tray, please pour them down the sink with plenty of water.
2. Place all fish and fish tissues directly into the garbage bag provided by your teacher.
3. Wash your dissecting instruments and dry them to prevent rusting.
4. Placing dissecting instruments back into the kit only when fully dry.
5. Wash out the dissecting tray with soapy water and lay them on a common bench to drip dry.
6. Dispose of your gloves with the fish waste and wash your hands thoroughly.