

BSC 201L (14e, rev.)
Lab #10 - The Fishes

Use the text and figures in **Exercise 18 (The Fishes)** to aid your study of the preserved specimens and slides; examine the additional specimens as indicated.

Things to know for Fishes:

- Presence/absence of jaws
- Male or female?
- Structures and their functions

Phylum Chordata – cont'd

- **notochord**; skeletal rod for muscle attachment
- **dorsal, tubular nerve cord**; anterior enlarged to form brain
- **pharyngeal pouches**; in aquatic spp., develop into **gill slits** (1° for particle feeding; 2° modified to true gills for respiration)
- **post-anal tail**; 1° for locomotion in water
- **endostyle**; secretes mucus and traps small food particles **OR** **thyroid gland**; the vertebrate derivative of the endostyle

Subphylum / Class Myxini, hagfishes

- jawless; “teeth” on tongue are not true teeth
 - no paired fins; no dorsal fin
 - slime glands
 - can tie body in a knot to gain leverage while feeding
- Myxine glutinosa*, Atlantic hagfish
1. Preserved adult
 - **LABELS**: 4 tentacles (barbels) surrounding the mouth

Subphylum Vertebrata

Class Petromyzontida, lampreys

- jawless; “teeth” in **buccal funnel** and on tongue are not true vertebrate teeth
- 1-2 dorsal fins

Petromyzon marinus – text pp. 275-280

2. Preserved **ammocoete larva**

- **LABELS**: buccal funnel, gill slits

DO NOT confuse the ammocoete larva with *Branchiostoma* (amphioxus / lancelet)!!!

Ammocoete:

oral hood with papillae
7 pairs of gill slits
has eyes
dorsal and caudal fins distinct

Branchiostoma*

*oral hood with tentacles
*numerous pharyngeal perforations
*lacks eyes
*lacks true fins

3. Preserved adult – Fig. 18-3
 - nostril is the hole on top of the head
 - photo-sensitive **pineal organ** is light colored area behind the nostril
 - **LABELS:** buccal funnel, gill slits, eyes, nostrils, first dorsal fin, second dorsal fin, caudal fin

Class Chondrichthyes, sharks, rays, skates, chimaeras

- cartilaginous skeleton, no true ossification
- jaws modified from pharyngeal arches; teeth are modified scales
- **spiracles:** modified first gill slits (accessory openings for water intake)
- be able to distinguish male from female (males have claspers on pelvic fins)

Shark – text pp. 280-285

- gill slits lateral (rays have gill slits on ventral side)
4. Preserved adult – Figs. 18-4, 18-6, 18-8
 - **LABELS:**
 - External: eye, nostril, spiracle, gill slits, lateral line canal, dorsal fins, pectoral fins, pelvic fins, caudal fin
 - Internal: intestine with spiral valve; liver
 5. Juvenile sharks (need only draw pelvic fins) – Fig. 18-7
 - distinguish male from female
 - **LABEL:** claspers (only on the male!)
 6. Shark jaws
 - teeth are modified **placoid scales**
 - rows of teeth constantly replace lost ones

Dasyatis americanus, American sting ray

- pectoral fins modified to form “wings”
 - ventral gill slits
7. Preserved adult

Chimaera (= rat fish)

- jaws w/ bony plates; upper jaw fused to cranium
 - males of this species have a clasper on the head as well as on the pelvic fins
8. Preserved adult
 9. Skate egg case (= “mermaid’s purse”)

Class Actinopterygii, bony ray-finned fishes

- **endochondral bone** (replaces cartilage during development)
- jaws; paired and median fins; operculum

Perca flavescens, yellow perch – text – 286-291

10. Preserved adult – Figs. 18-9, 18-11, 18-12

– **LABELS:**

External: eyes, gills, first dorsal fin, second dorsal fin, pectoral fins, pelvic fins, anal fins, caudal fin

Internal: swim bladder

Congrina flava, yellow conger eel

- compare mouth and fins with lamprey and hagfish

11. Preserved adult

DO NOT confuse the “conger eel” (a fish) with the “Congo eel” (a type of salamander)!!!

Fish scale types (scales reduce drag for more efficient swimming):

12. **placoid** scales – Fig. 18-5B

- shark scales are dermal denticles (= “epidermal teeth”) with pulp, dentine, enamel

13. **ganoid** scales

- primitive bony scales, found in bichirs, paddlefishes, sturgeons, gars
- diamond-shaped; enamel on upper surface, bone on lower

14. **cycloid** scales

- smooth margins, with no teeth or projections
- found in fish with soft-rayed fins (*i.e.*, minnows, goldfish); slower swimmers

15. **ctenoid** scales (most common scale type)

- comb-like projections reduce drag, increase swimming efficiency
- found in fish with spiny-rayed fins (*i.e.*, yellow perch); faster swimmers

Observation: examine fish diversity (no drawings needed)

Observations: Examine the Lamprey, Dogfish (= shark), and Perch Biosmounts. [Not necessary to draw, but helpful with dissections, etc.]

FOR NEXT LAB MEETING:

- download **handout for Lab #11**; the lab activities are not in the lab manual
- write out each taxonomic summary in your Laboratory Specimen Notebook BEFORE lab.