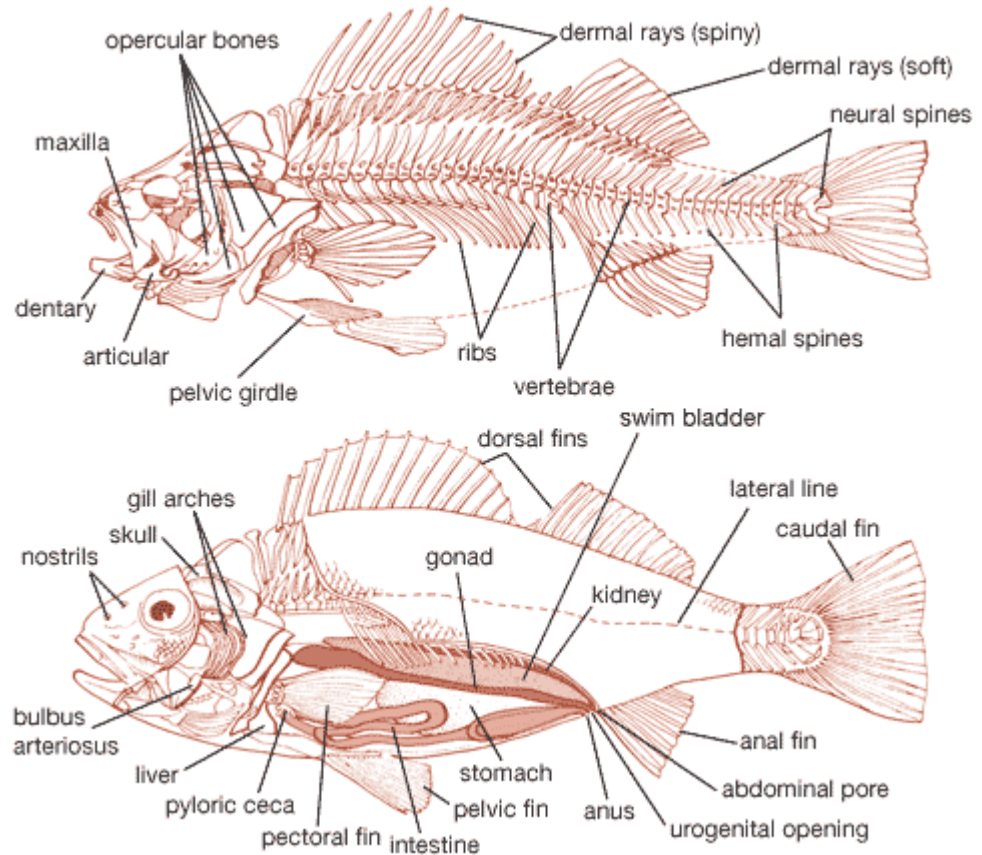


# Lecture 2 – Anatomy and characteristics of fishes

- **Overview of overall anatomy**

## *General overhead*

- - Body regions
- - Fins
- - Skeleton (cranium, jaws)
- **axial skeleton- protects body organs**
- **appendicular skeleton – helps in movement**



# Characteristics of fishes

Jawless fishes, jawed cartilagenous fishes, jawed bony fishes

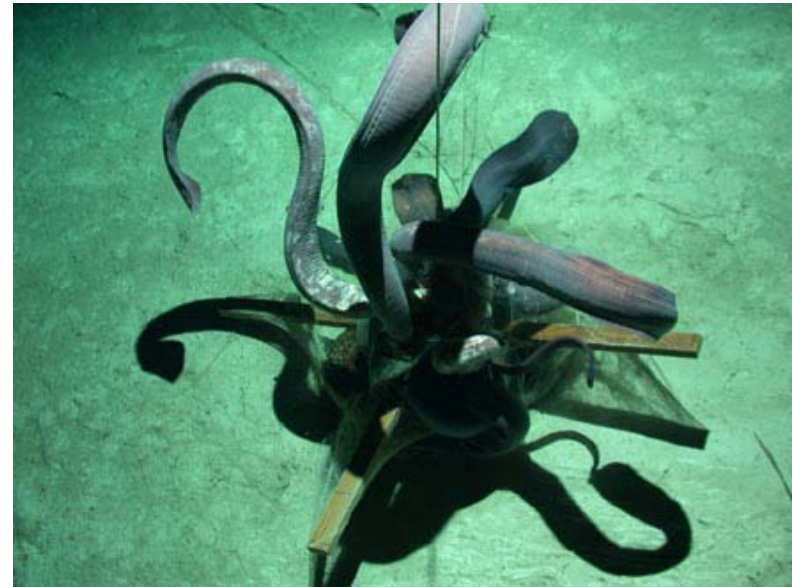
## 1. Jawless fishes (Agnatha)

- Lampreys and hagfish
- Cartilagenous notochord
- Both have no paired fins but have fin folds and caudal fin
- Fin folds rod-like supports
- Lack scales
- Single median nostril
- Cloaca (common cavity into which the anus and urogenital pore enter)



# Hagfishes (overhead)

- scavengers
- barbels around mouth and nostril
- mouth has horny plates with rows of triangular shaped teeth
- blind but with tiny light sensitive organs
- row of slime glands down flank
- 1-16 gill slits
- 5 hearts –1 to head, 1 to gills, 1 to viscera, 2 to notochord



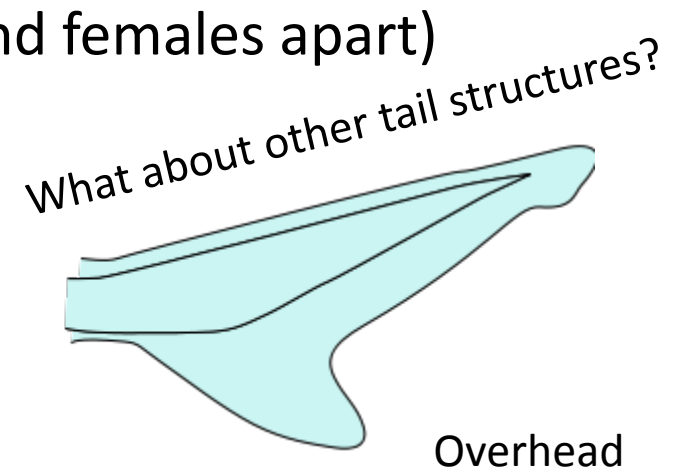
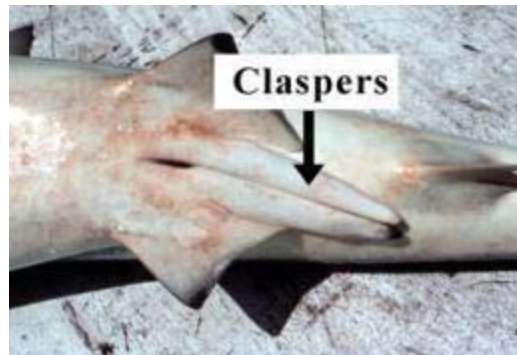
# Lampreys (overhead)

- Parasitic or non-feeding
- Mouth with oral disk and rasping teeth (sucking and feeding)
- mouth has horny plates with rows of triangular shaped teeth
- 7 gill slits



## 2. Jawed cartilaginous fishes (*Chondrichthyes*)

- Developed jaw
- Beginning of calcification in skeleton
- True bony teeth in jaws and bony placoid scales
- Paired fins
- Gills with individual openings (5-7 gill slits)
- Claspers
- Heterocercal caudal fin
- Free upper eyelids
- Sexually dimorphic (can tell males and females apart)





## 2. *Jawed cartilagenous fishes*

*Can be divided into Holocephali and Elasmobranchii*

### A. Holocephali (Chimaeras)

- Upper jaw fused with cranium (hence name)
- 2° lost scales
- Ovipary (egg laying – eggs develop outside mother)
- Anus + urogenital pore



overhead

## B. Elasmobranchii

- Sharks, skates and rays
- Free upper jaw
- Pair of spiracles on head (note the large spiracle in demersal forms)
- Ovipary, ovovivipary (embryos develop inside eggs in mother, no placenta) and yolk-sac vivipary (requiem sharks)
- Cloaca (common cavity into which the anus and urogenital pore enter)



### *3. Jawed bony fishes (overhead)*

- Incredibly diverse
- Ossification of skeleton
- Free upper jaw
- Single operculum
- All forms of reproduction
- Anus and urogenital pore
- Ganoid, cosmoid and elasmoid scales

