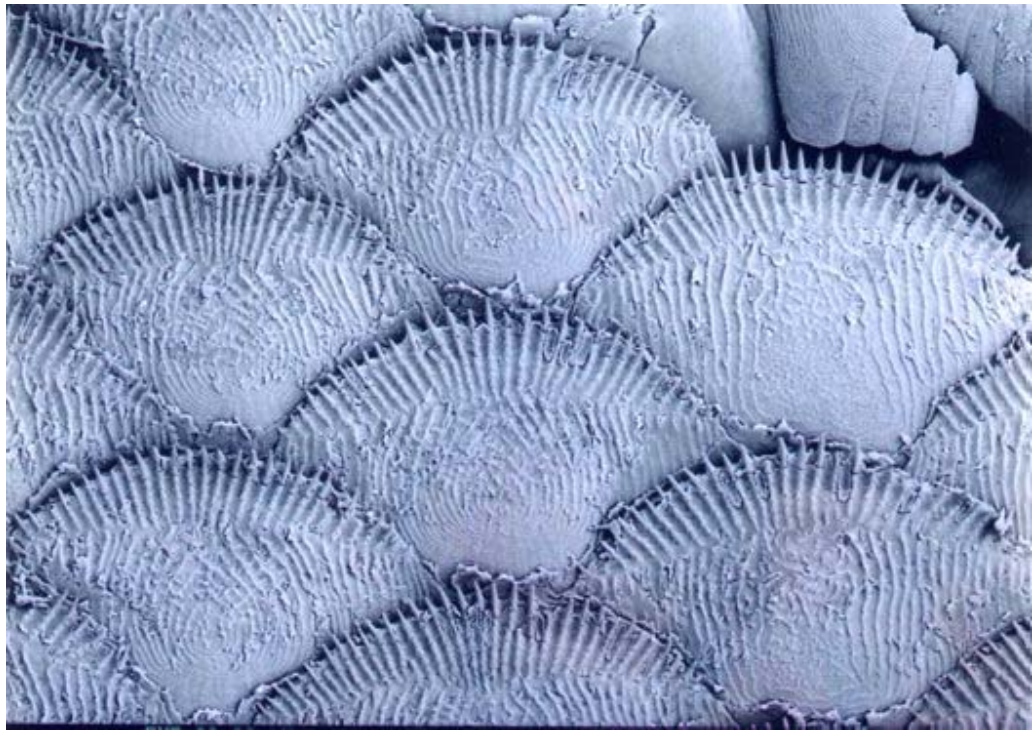
Marine Fishes

Chapter 8

Types of Marine Fish

Osteichthyes, The Bony Fish

- Flat bony scales (ctenoid or cycloid) protect body

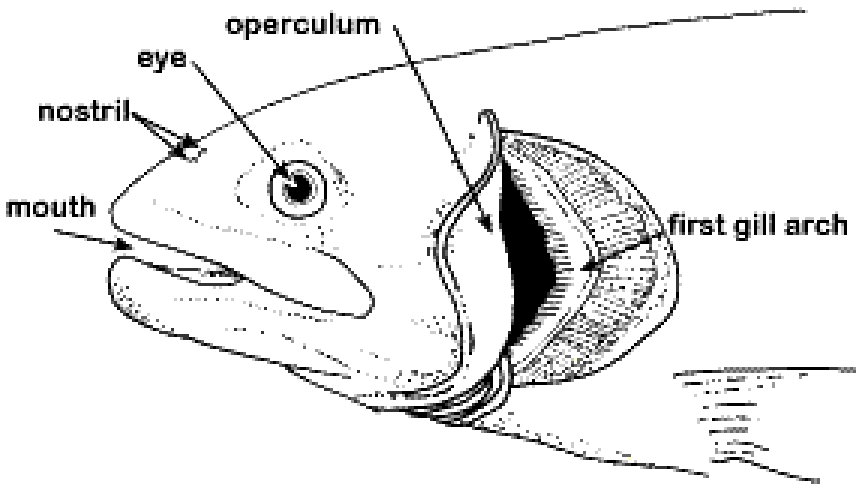


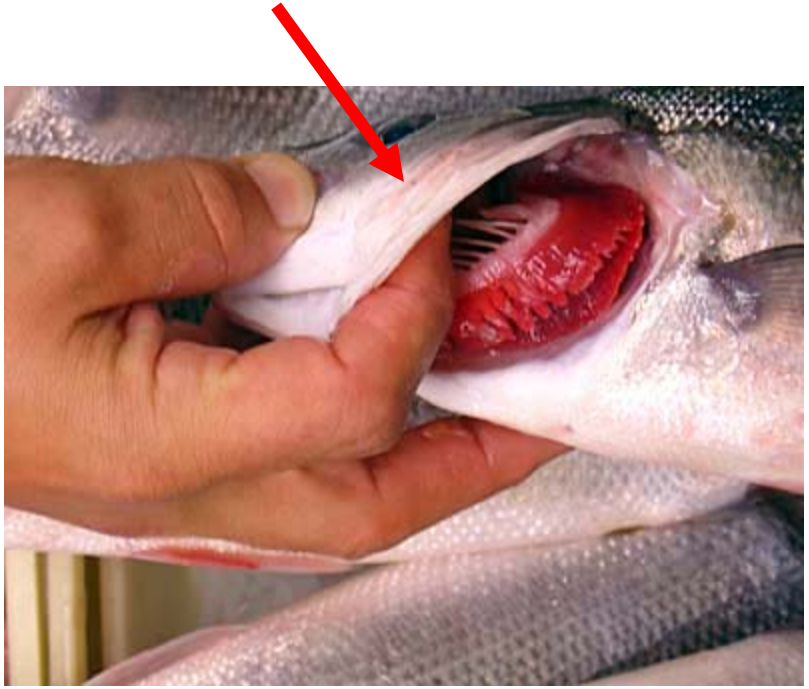
Ctenoid scales on Paradise Fish

Types of Marine Fish

Osteichthyes, The Bony Fish

- Bony operculum covers the gills (provides better protection against injury compared to gill slits for each gill)





Types of Marine Fish

Osteichthyes, The Bony Fish

- Lateral line used in sensory capacity and communication

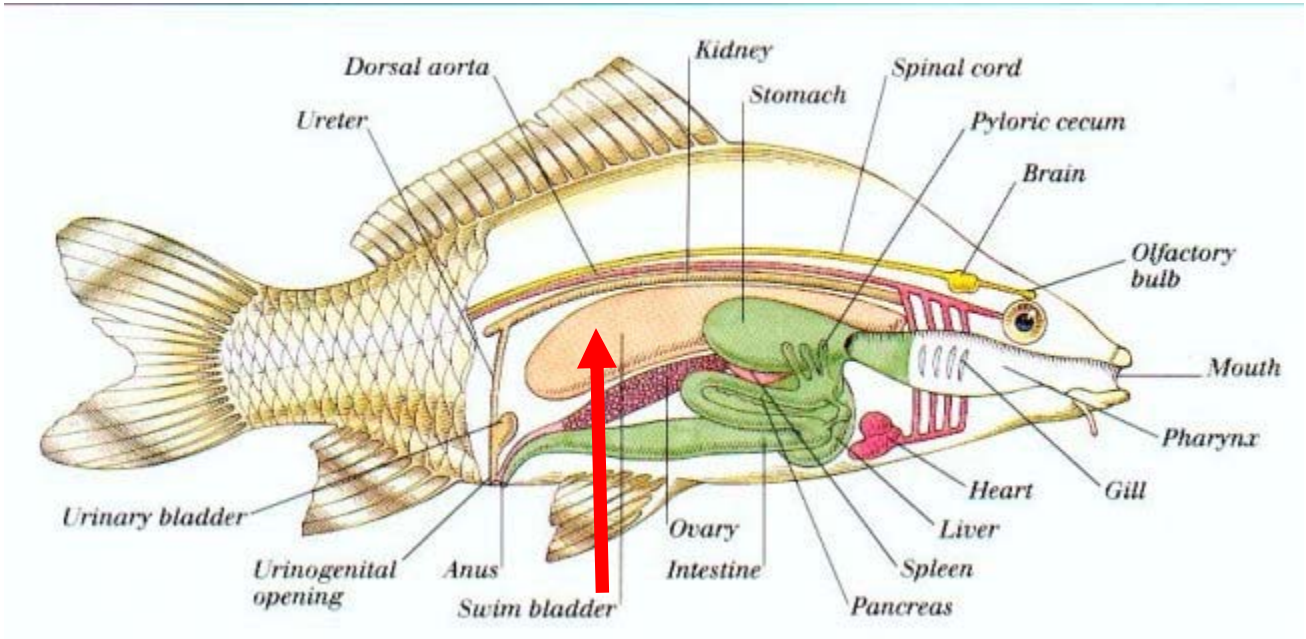
- https://www.youtube.com/watch?v=mOWnlwLUvKA

Types of Marine Fish

Osteichthyes, The Bony Fish

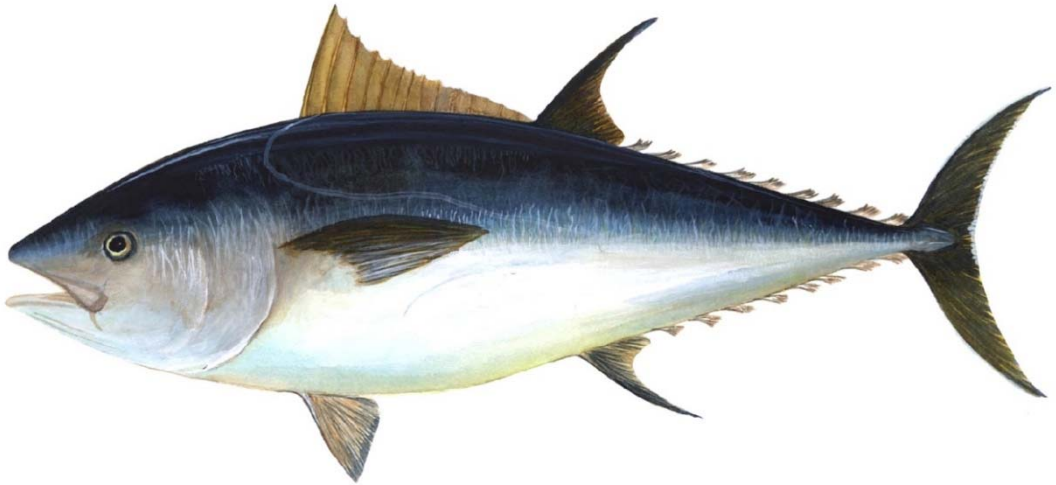
- Swim bladder used for buoyancy control (some bottom dwelling fish lack swim bladder)

- Variable body plans are adapted for specific environments



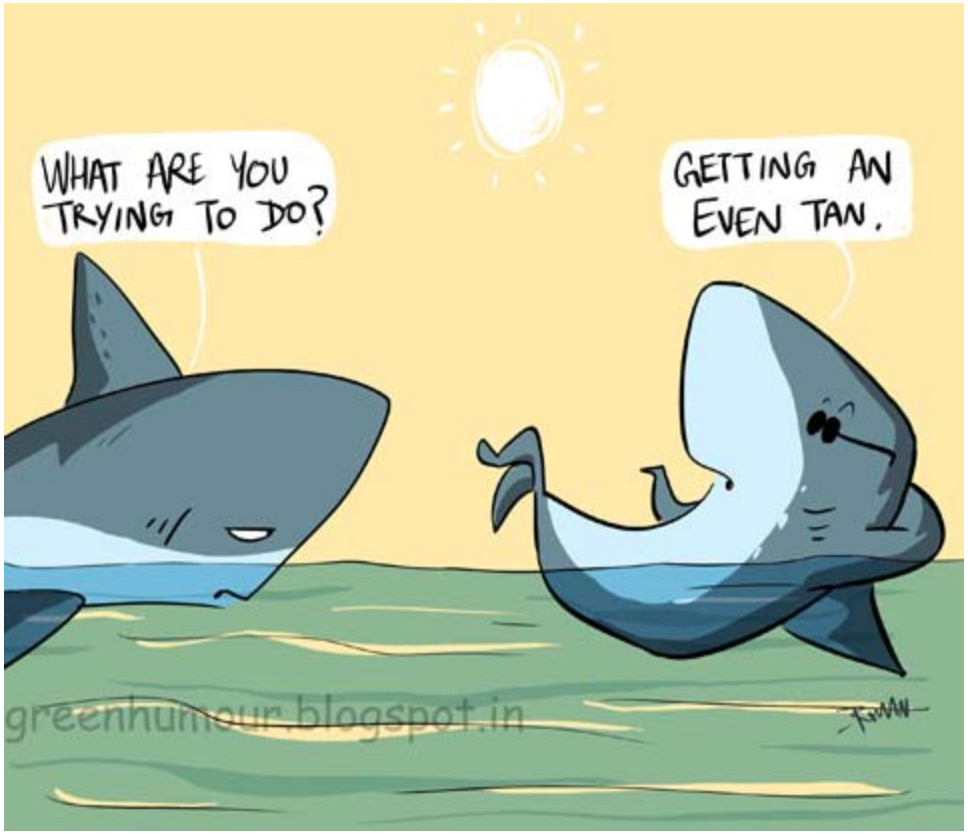
Types of Marine Fish

- **Coloration Patterns:**
  - Countershading is seen in virtually all fish species
  - In countershading, the ventral (belly) area of the fish is lighter than the dorsal area of the fish



Types of Marine Fish

- **Coloration Patterns**
  - This allows the fish to "blend in" with the environment

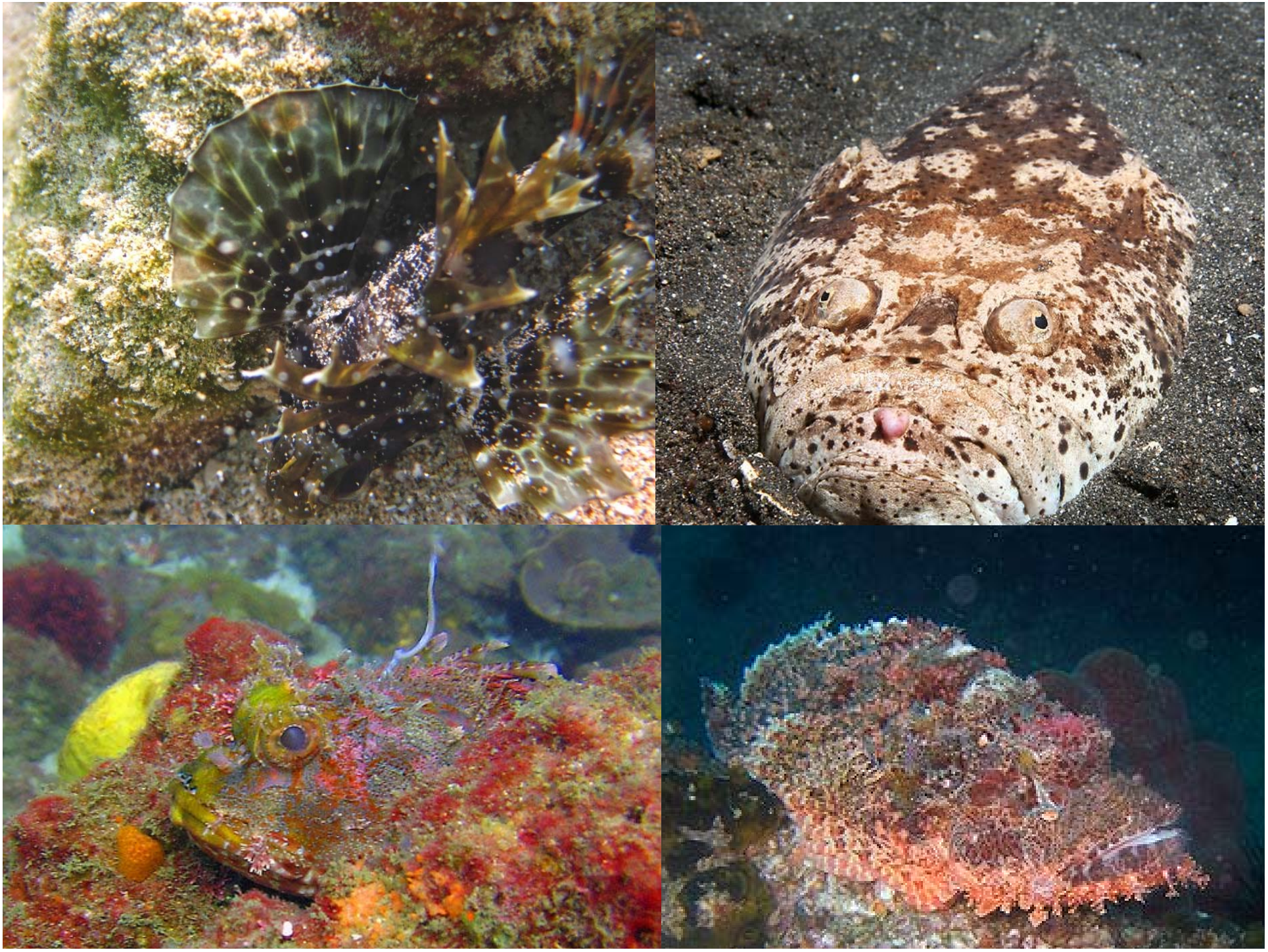


- If a fish is seen from above, the darker coloration of the dorsal area blends in with the darker color of the ocean bottom

- If the fish is seen from below, the lighter coloration of the ventral surface blends in with the lighter coloration of the ocean surface

Types of Marine Fish

- **Coloration Patterns:**
  - Slower swimming fish often have bars or stripes that help break up the silhouette of a fish (a form of disruptive coloration)
  - This helps with predator avoidance
  - Some also have coloration that helps them blend in with environment (known as cryptic coloration)



Types of Marine Fish

Coloration Patterns

- It is also not usually to see a fish with circular patterns on or near the caudal fin

- This confuses predators who are not sure which end of the fish is the head

Types of Marine Fish

Coloration Patterns

- If the fish at right is attacked on caudal end where the black dot looks like an eye, he can probably get away with minor damage

- However, if he is attacked on his head region, he may sustain serious, life threatening damage

- Some fishes may also use color to advertise their bad taste or poisonous nature – this is known as warning coloration


Lionfish

Types of Marine Fish

Body Shapes

- Vary greatly among fish dependent on the environment that fish calls home

- For example, flounders and soles live on the bottom and cover themselves slightly with sand to camouflage themselves from potential predators as well as prey

- The flat shape of the flounders and soles is well adapted to this lifestyle

Types of Marine Fish

Body Shapes

- Tuna, billfish, and other fast moving predators are long, streamlined and most of their fins serve as rudders basically (very little flexibility except in caudal fin)

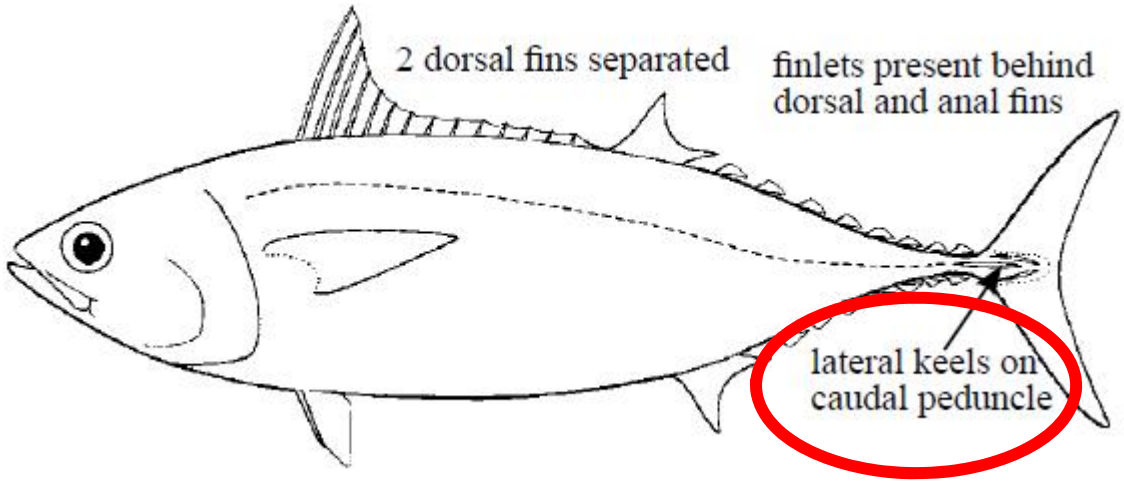
- This body shape allows these predators to cut through the water quickly

- https://www.youtube.com/watch?v=spkjQ3c_AjU

Types of Marine Fish

Body Shapes

- The area of the body called the caudal peduncle (area just before the tail) is very thin
  - this allows all the muscles to concentrate in this area allowing for greater thrust of the caudal (tail) fin
  - this means FAST swimming capabilities



Billfish’s caudal peduncle

Types of Marine Fish

Body shapes

- By contrast, the angelfish represents the opposite environment

- Angelfish and many other fish do not inhabit the open waters of the ocean like tunas and billfish do

- Angelfish and the like inhabit coral reefs, oyster reefs and other similar environments

Types of Marine Fish

Body shapes

- In these fish, the body is not as streamlined and the fins are feather-like for lots of flexibility
- This flexibility allows for greater control around the features that would be seen in a coral reef type environment (crevices, etc)

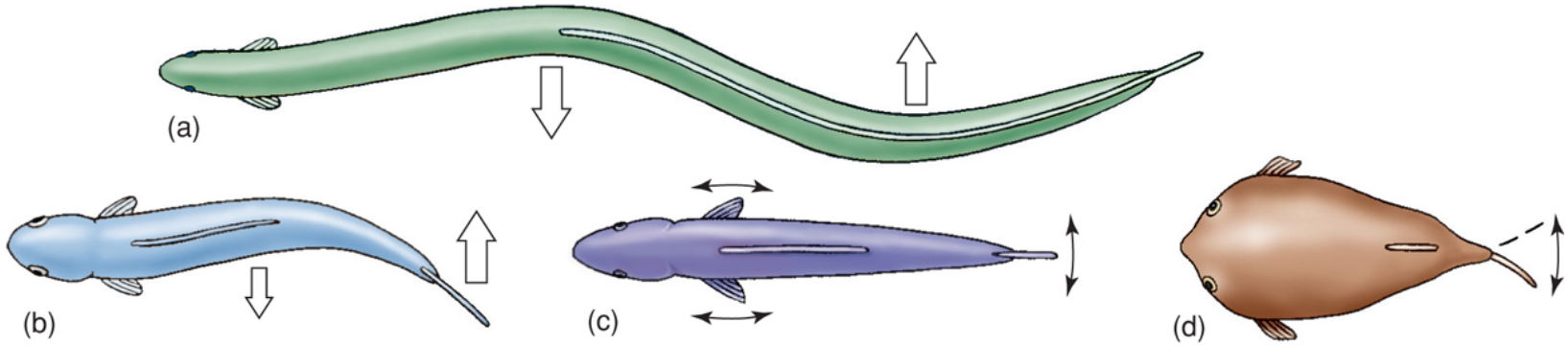
Types of Marine Fish

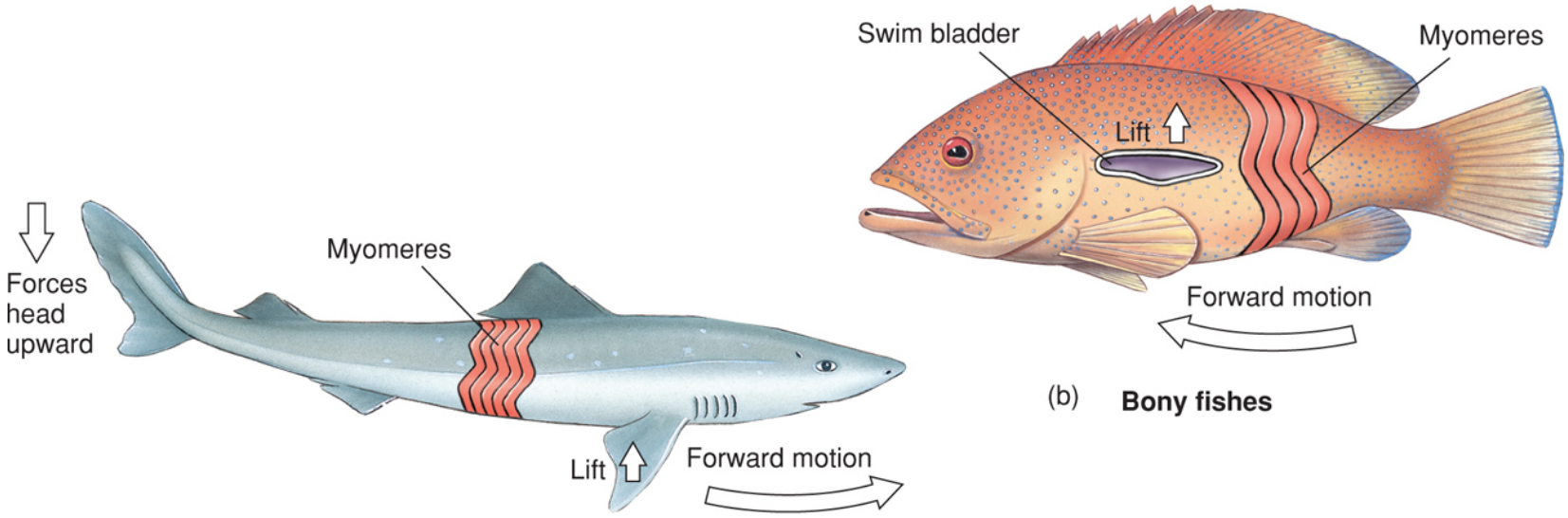
Body Shapes

- Other fish have a shape that allows for camouflage in their environment
- For example, fish like the toadfish and the stonefish actually look like rocks or “scenery” and thus can go undetected by predators or prey

Swimming Patterns

- Fish exhibit an "s-shaped" swimming pattern
- Bands of muscle along the body called myomeres drive this swimming motion
- Depending on the type of fish, different fins may be used primarily for the forward movement





(b) **Bony fishes**

(a) **Cartilaginous fishes**

Swimming Patterns

- In sharks, a swim bladder is absent (although there is a large lipid-rich liver to help in buoyancy)
  - therefore, sharks tend to sink when not in motion and there is no lift from the swim bladder while swimming either

- While swimming, sharks are aided by the "lift" provided by the position and stiffness of the pectoral fins

- http://www.discovery.com/tv-shows/shark-week/videos/how-sharks-swim/

Swimming Patterns

- In bony fish, pectoral fins are not needed for lift and thus are normally not stiff in construction (exception: fast swimming species like tuna, billfish, etc)

- In contrast, the pectoral fins in many bony fins are flexible and used for maneuverability

Swimming Patterns

- In some slower-swimming species, forward movement is mainly provided primarily by the pectoral fins

Lumpsucker

Swimming Patterns

- In other species, all the fins may be flexible and highly modified for camouflage (example: sea horses and sea dragons)

- This means that the fins will not allow for significant forward movement

Seahorse

Sea Dragon