Chapter 3

Requirements:

- **first name (e.g spiny dogfish)**
- **Classification**

Spiny dogfish *Squalus sp.* White shark *Carcharodon sp.*

Hammer headed shark *Sphyma sp.* Sawshark Peristiophorus

FIGURE 4: Some species of Squaliformes.

1. Spiny Dogfish (Squalus sp.):
   - Classification:
     - Kingdom: Animalia
     - Phylum: Chordata
     - Class: Chondrichthyes (Cartilaginous fish)
     - subclass: Elasmobranchi
     - Order: Squaliformes
     - ~~Family: Squalidae~~
     - Genus: Squalus

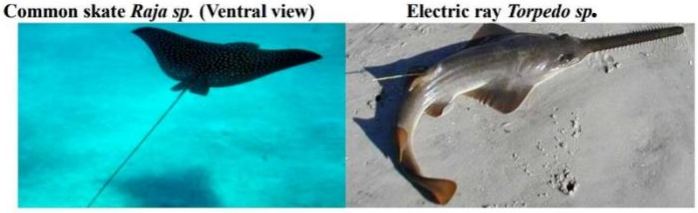
2. White Shark (Carcharodon sp.):
   - Classification:
     - Kingdom: Animalia
     - Phylum: Chordata
     - Class: Chondrichthyes (Cartilaginous fish)
     - subclass: Elasmobranchi
     - Order: Squaliformes
     - ~~Family: Lamnidae~~
     - Genus: Carcharodon

3. Hammerhead Shark (Sphyma sp.):
- Classification:
- Kingdom: Animalia
- Phylum: Chordata
- Class: Chondrichthyes (Cartilaginous fish)
- subclass: Elasmobranchi
- Order: Squaliformes
- Family: ~~Sphyrnidae~~
- Genus: Sphyrna

4. Sawshark (Peristiophorus):
- Classification:
- Kingdom: Animalia
- Phylum: Chordata
- Class: Chondrichthyes (Cartilaginous fish)
- subclass: Elasmobranchi
- Order: Squaliformes
- Family: ~~Pristiophoridae~~
- Genus: Peristiophorus

FIGURE 5: Dorsal and ventral view of rajiform fish, *Raja sp.*

Common skate *Raja sp.* (Ventral view) **Electric ray *Torpedo sp.***



Eagle ray *Myliobti sp.* **Sawfish *Pristis sp.***

FIGURE 6: Some Rajiformes species.

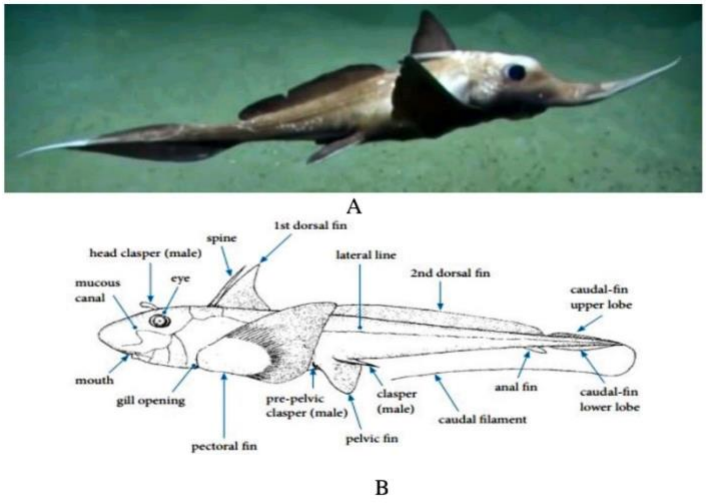
1. Common Skate (Raja sp. - Ventral view):
- Classification:
- Kingdom: Animalia
- Phylum: Chordata
- Class: Chondrichthyes (Cartilaginous fish)
- subclass: Elasmobranchi
- Order: Rajiformes
- Family: ~~Rajidae~~
- Genus: Raja

2. Electric Ray (Torpedo sp.):
  - Classification:
    - Kingdom: Animalia
    - Phylum: Chordata
    - Class: Chondrichthyes (Cartilaginous fish)
    - subclass: Elasmobranchi
    - Order: Rajiformes
    - Family: ~~Torpedinidae~~
    - Genus: Torpedo

3. Eagle Ray (Myliobati sp.):
  - Classification:
    - Kingdom: Animalia
    - Phylum: Chordata
    - Class: Chondrichthyes (Cartilaginous fish)
    - subclass: Elasmobranchi
    - Order: Rajiformes
    - Family: ~~Myliobatidae~~
    - Genus: Myliobatis

4. Sawfish (Pristis sp.):
  - Classification:
    - Kingdom: Animalia
    - Phylum: Chordata
    - Class: Chondrichthyes (Cartilaginous fish)
    - subclass: Elasmobranchi
    - Order: Rajiformes
    - Family: ~~Pristidae~~
    - Genus: Pristis

Requirements:
name and classification

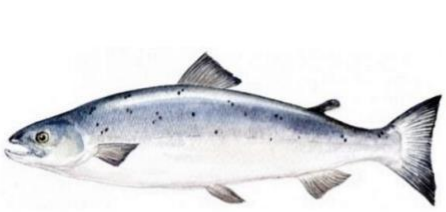


Chimaera sp., (A) Elephantfish and (B) Ratfish general form.

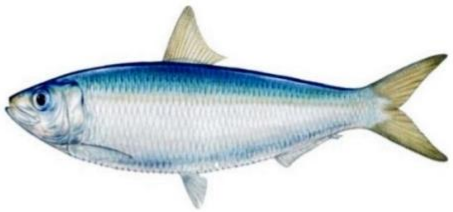
The Members of this small subclass distinguished by such suggestive names as chimaeras, also spelled chimeras, also called **ghost sharks.**

(A) Elephantfish:
- Name: Elephantfish (genus)
- Classification:
  - Kingdom: Animalia
  - Phylum: Chordata
  - Class: Chondrichthyes (Cartilaginous fish)
  - subclass: Holocephali
  - Order: Chimaeriformes
  - Family: ~~Callorhinchidae~~
  - Genus: Callorhinchus

(B) Ratfish:
- Name: Ratfish Chimaera (genus)
- Classification:
  - Kingdom: Animalia
  - Phylum: Chordata
  - Class: Chondrichthyes (Cartilaginous fish)
  - subclass: Holocephali
  - Order: Chimaeriformes
  - Family: ~~Chimaeridae~~
  - Genus: Hydrolagus



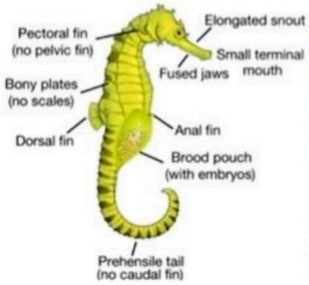
Salmon *Salmo sp.*



Sardine *Sardinops sp.*

Eel fish *Anguilla sp.*

Flying fish *Exocoetus sp.*



Sea horse *Hippocampus sp.*

Porcupine fish *Diodon sp*

Selected teleost fishes.

1. Salmon (Salmo sp.):
   - Scientific Name: Salmo (genus)
   - Classification:
     - Kingdom: Animalia
     - Phylum: Chordata
     - Class: Osteichthyes (bony fishes)
     - SubClass: Actinopterygii (Ray-finned fish)
     - Superorder: Teleostei
     - Order: ~~Salmoniformes~~
     - Family: ~~Salmonidae~~
     - Genus: Salmo

2. Sardine (Sardinops sp.):
- Scientific Name: Sardinops (genus)
- Classification:
  - Kingdom: Animalia
  - Phylum: Chordata
  - Class: Osteichthyes (bony fishes)
  - SubClass: Actinopterygii (Ray-finned fish)
  - Superorder: Teleostei
  - Order: ~~Clupeiformes~~
  - Family: ~~Clupeidae~~
  - Genus: Sardinops

3. Eel fish (Anguilla sp.):
- Scientific Name: Anguilla (genus)
- Classification:
  - Kingdom: Animalia
  - Phylum: Chordata
  - Class: Osteichthyes (bony fishes)
  - SubClass: Actinopterygii (Ray-finned fish)
  - Superorder: Teleostei
  - Order: ~~Anguilliformes~~
  - Family: ~~Anguillidae~~
  - Genus: Anguilla

4. Flying fish (Exocoetus sp.):
- Scientific Name: Exocoetus (genus)
- Classification:
  - Kingdom: Animalia
  - Phylum: Chordata
  - Class: Osteichthyes (bony fishes)
  - SubClass: Actinopterygii (Ray-finned fish)
  - Superorder: Teleostei
  - Order: ~~Beloniformes~~
  - Family: ~~Exocoetidae~~
  - Genus: Exocoetus

5. Sea Horse (Hippocampus sp.):
- Scientific Name: Hippocampus (genus)
- Classification:
  - Kingdom: Animalia
  - Class: Osteichthyes (bony fishes)
  - SubClass: Actinopterygii (Ray-finned fish)
  - Superorder: Teleostei
  - Order: ~~Syngnathiformes~~
  - Family: ~~Syngnathidae~~
  - Genus: Hippocampus

6. Porcupine Fish (Diodon sp.):
- Scientific Name: Diodon (genus)
- Classification:
  - Kingdom: Animalia
  - Phylum: Chordata
  - Class: Osteichthyes (bony fishes)
  - SubClass: Actinopterygii (Ray-finned fish)
  - Superorder: Teleostei
  - Order: ~~Tetraodontiformes~~
  - Family: ~~Diodontidae~~
  - Genus: Diodon

Coelacanth *Latimeria sp.*

Living crossopterygian or a coelacanth fish, lobed-fin fish. i. All fins except the first dorsal fin are typical lobe-fins; ii. Internal nares are lacking; Caudal fin diphycercal with a small median lobe, so apparently with 3 lobes.

Australian lungfish. i. Internal nares or choanae are present. ii. Swim bladder is well developed, highly vascularized and used as a lung in respiration. iii. Paired lobe-fin present. vi. Median fin continues to form diphycercal caudal fin.

Coelacanth fish

- Classification:
  - Kingdom: Animalia
  - Phylum: Chordata
  - Subphylum: Vertebrata
  - Class: Osteichthyes (bony fishes)
  - Subclass: Sarcopterygii
  - Order: Dipnoi
  - Family: ~~Latimeriidae~~
  - Genus: Latimeria

Australian fish

- Kingdom: Animalia
- Phylum: Chordata
- Class: Osteichthyes (bony fishes)
- Subclass: Sarcopterygii
- Order: Dipnoi
- Family: ~~Neoceratodontidae~~
- Genus: Neoceratodus
- Species: Neoceratodus forsteri

Table 1. Comparison between cartilaginous and bony fishes

Chondrichthyes (cartilaginous fishes)	Osteichthyes (bony fishes)
1. Mostly marine.	1. Both marine and freshwater.
2. Usually dorso-ventrally flattened.	2. Bilaterally flattened.
3. Mouth and nostrils are ventral, mouth large and with crescent shape	3. Mouth terminal and variable in shape and size. Nostrils above to mouth.
4. Mostly first gill slits reduced to spiracles which just behind the eyes.	4. Spiracles are lacking.
5. Five pairs of naked gill slits, no true operculum.	5. Four pairs of gills lie in pouch covered by Bony flap which is true bony operculum.
6. Exoskeleton comprises separate dermal Placoid scales.	6. Exoskeleton comprises various types of Overlapping dermal scales: cosmoid, ganoid, cycloid or ctenoid.
7. Endoskeleton is wholly cartilaginous.	7. Endoskeleton is mostly bony.
8. Pelvic fins far more from pectoral fins.	8. Pelvic fins usually near to pectoral fins.
9. In males two claspers each inside to pelvic Fin for transferring sperm into female genital tract.	9. Claspers are absent.
10. Cloaca is a common opening for three ducts: alimentary, urinary and genital. cloaca lies between two pelvic fins.	10. Anus and urinogenital apertures open separately, no cloaca.
11. Fertilization internal.	11. Fertilization external in water.
12. Eggs few, large with much yolk.	12. Eggs numerous, small with less yolk.
13. Internal development in ovoviviparous type, and if external (oviparous) occurs in egg case.	13. Development usually external without egg case.
14. Swim bladder absent.	14. Swim bladder present for buoyancy.

Prepared by Firas