



VERTEBRATES TAXONOMY

Practical Part



Zoology Department - Faculty of Science
2022-2023

About the Book
Practical part of
Vertebrata Taxonomy

College/Institute: Faculty of Science

Grade: B.Sc.

Major: Zoology

Course name: Vertebrata Taxonomy

For 3rd Zoology students

Code: Zoo 304

Year: 2022/2023

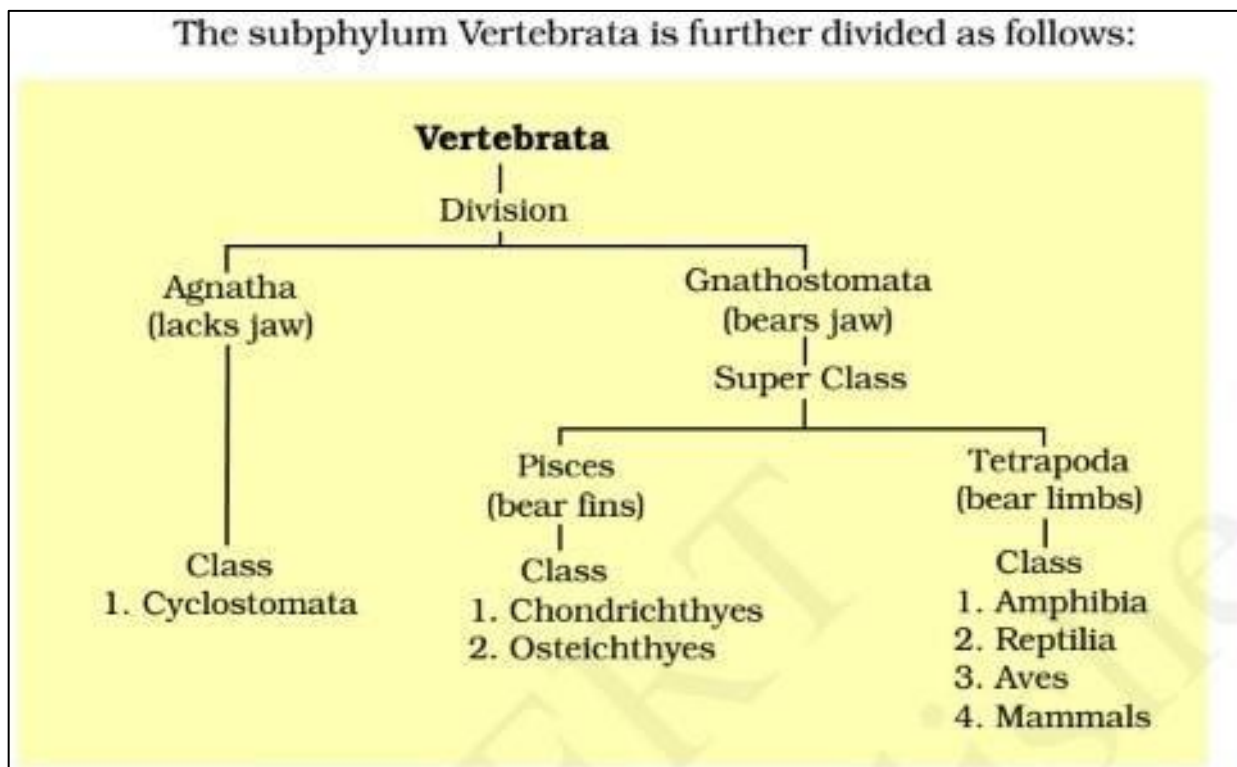
Author: Obaida Fawzi

Vertebrates Taxonomy

(Practical part)

The practical part of this course discusses the classification and description of animals in the different classes of vertebrates in Egypt as follows:

- 1- Chondrichthyes (Cartilaginous fishes)
- 2- Osteichthyes (Bony fishes)
- 3- Reptilia (Reptiles)



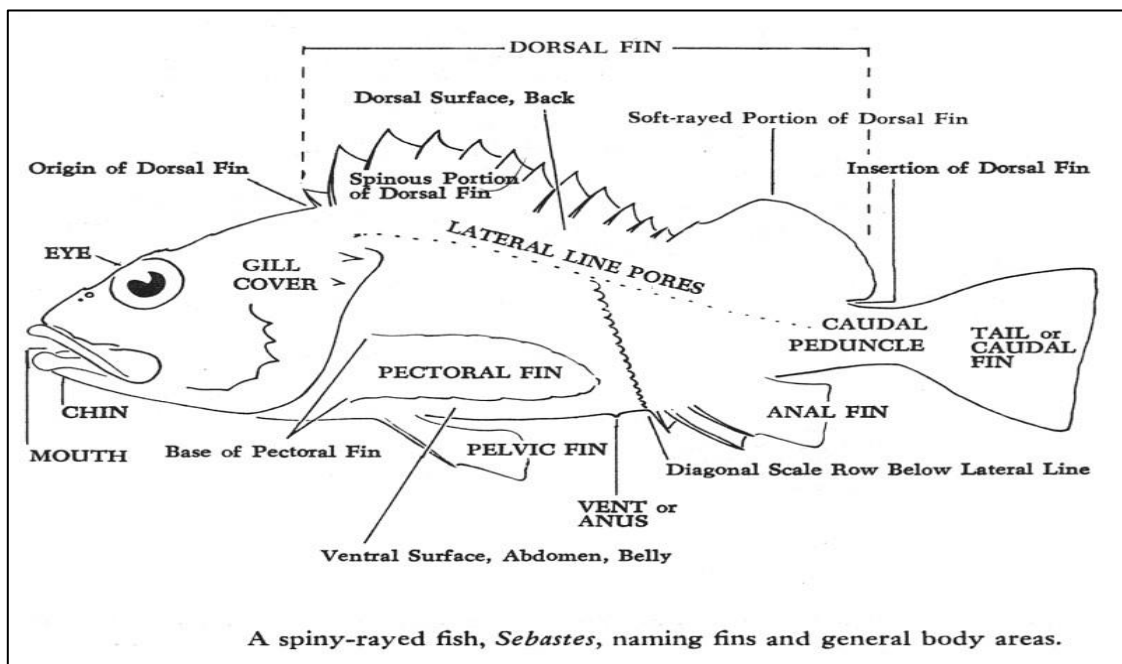
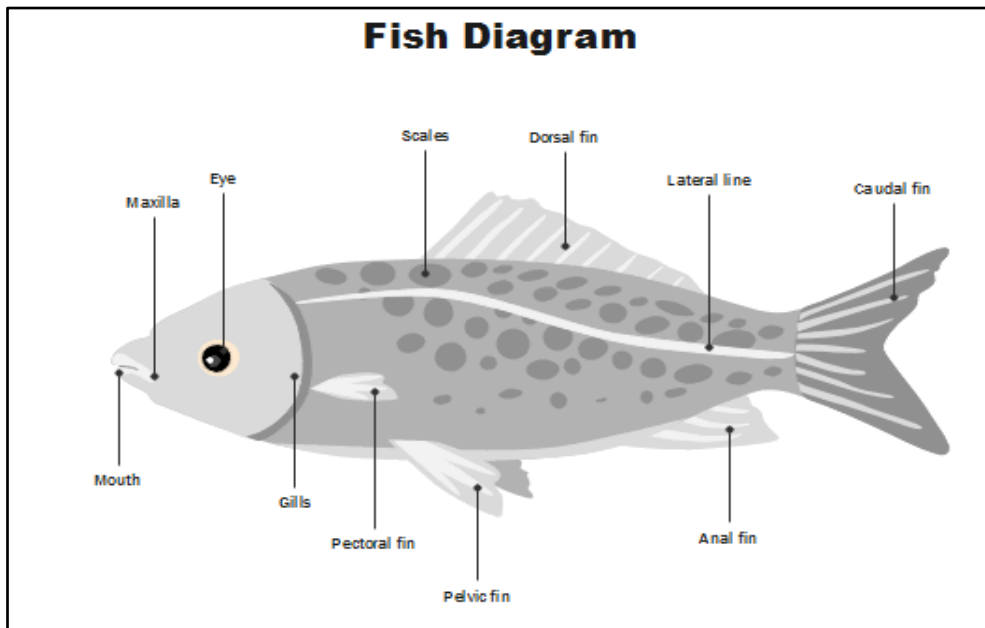
4- Aves (Birds)

5- Mammalia (Mammals)

Fishes





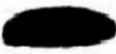



Fishes including cartilaginous and bony fishes are aquatic. Most of cartilaginous fishes are marine that live in seas and oceans, while bony fishes are both fresh and marine that can be found in seas, oceans, rivers, and lakes.

A fish body consists of three parts: **head**, **trunk**, and **tail**. It has special characteristics from which it can be identified and described.



Fish description key:

- 1- **Body shape:**
- Cylindrical / Fusiform
 - Dorsoventrally depressed (from top to bottom)
 - Bilaterally compressed (from side to side)
 - Filiform / eel-like (shaped like snake)

BODY SHAPE			
Crosssection	Fish	Shape	Locomotion
	 Tuna	Fusiform	Fast-swimming in open water.
	 Tautog	Compressiform	Quick speed for short distances.
	 Skate	Depressiform	Swims like a flying bird.
	 Pipefish	Filiform	Slithers through the water like a snake.

2- **Body colour:** (Dorsal surface - Ventral surface)

3- **Scales:** (Present - Absent) / (Type if present)

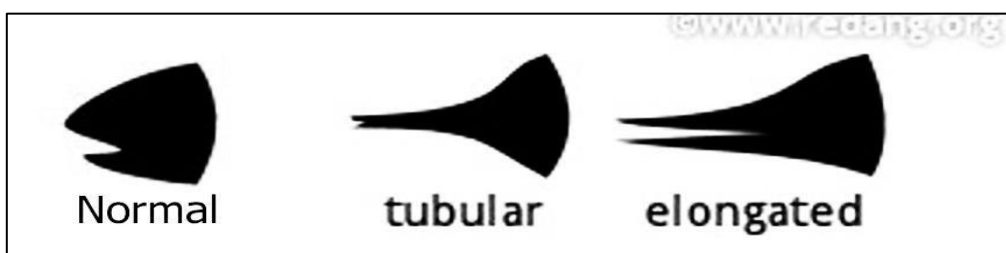
4- **Head:** a- size (small - medium - large)

b- shape (cylindrical - dorsoventrally depr. - bilaterally comp.)

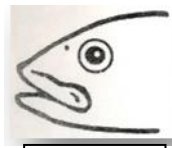
c- eyes (size - shape “round/oval”)

(position on the head: one on each side / both on one side / both on dorsal surface)

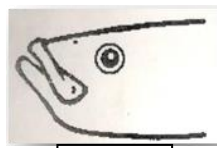
d- Snout:



e- mouth: - position (terminal - dorsal - ventral)
- size (narrow - wide)



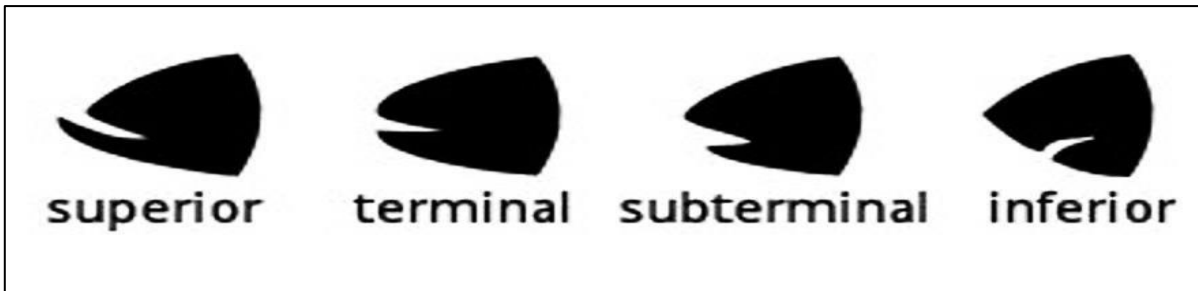
terminal



dorsal



ventral



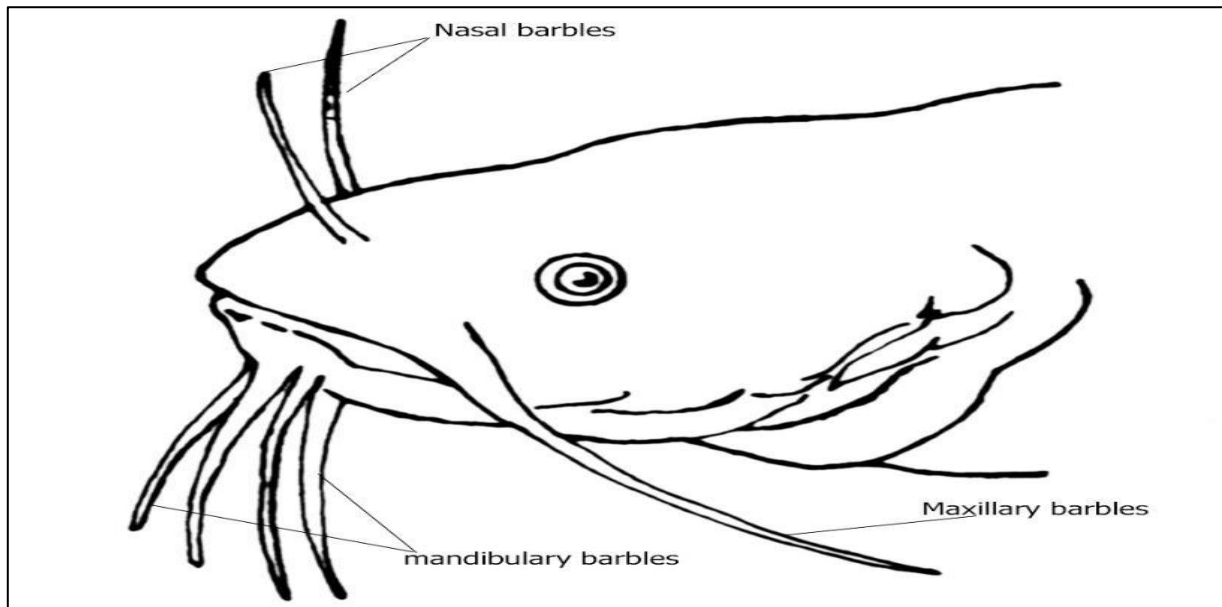
f- nostrils: (one or two on each side - size - shape)

g- spiracles:(a pair behind the eyes) **“Cartilaginous fishes”**

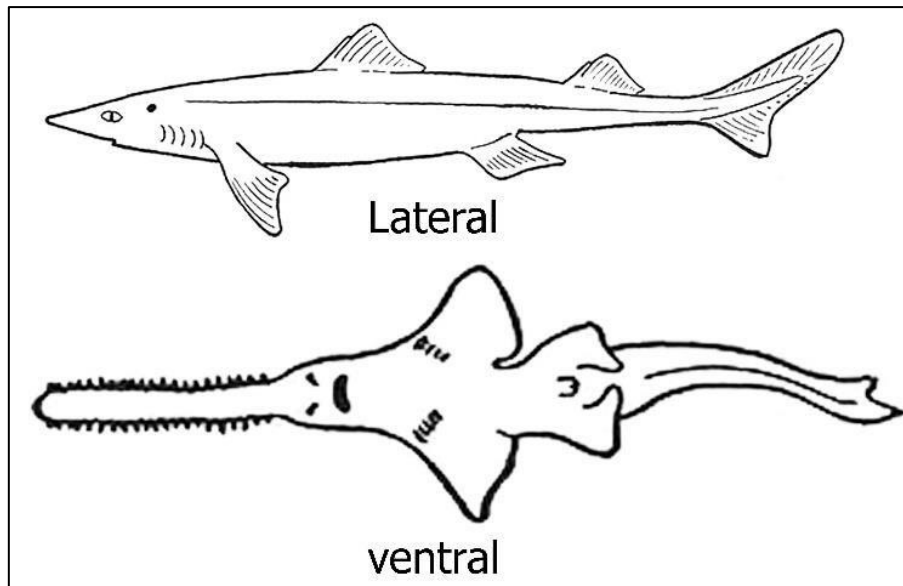
h- Teeth: (present - absent)

i- Barbles: (present – absent)

(type and number: nasal - maxillary - mandibular)



J- Gill slits “**Cartilaginous fishes**”: (number - position)



k- operculum “**bony fishes**”:

- Connected to isthmus.
- Separated from isthmus (overlapped - non overlapped)

5- **Trunk:**

a- size (small - medium - large)

b- shape (cylindrical - dorsoventrally dep. - bilaterally comp.)

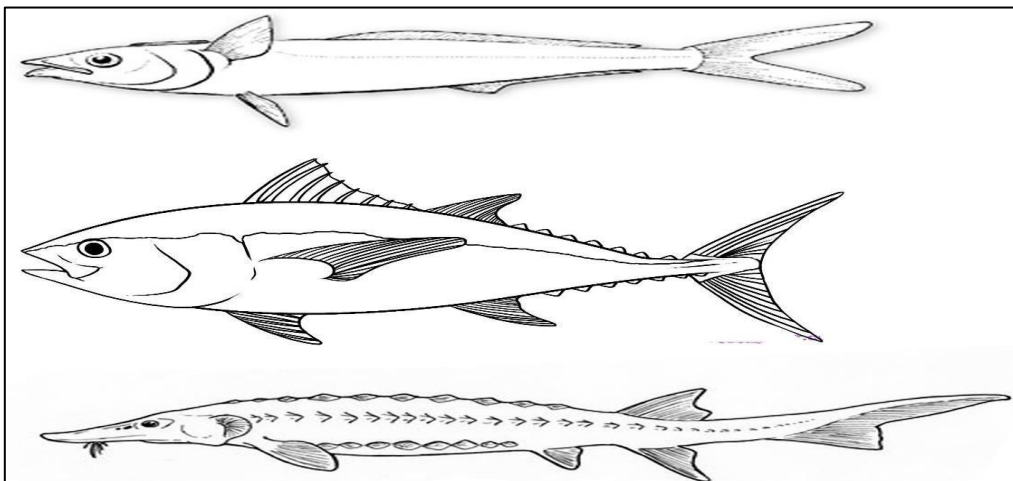
c- fins:

Paired : pectoral fins

- (fin rays with spines or not) - size

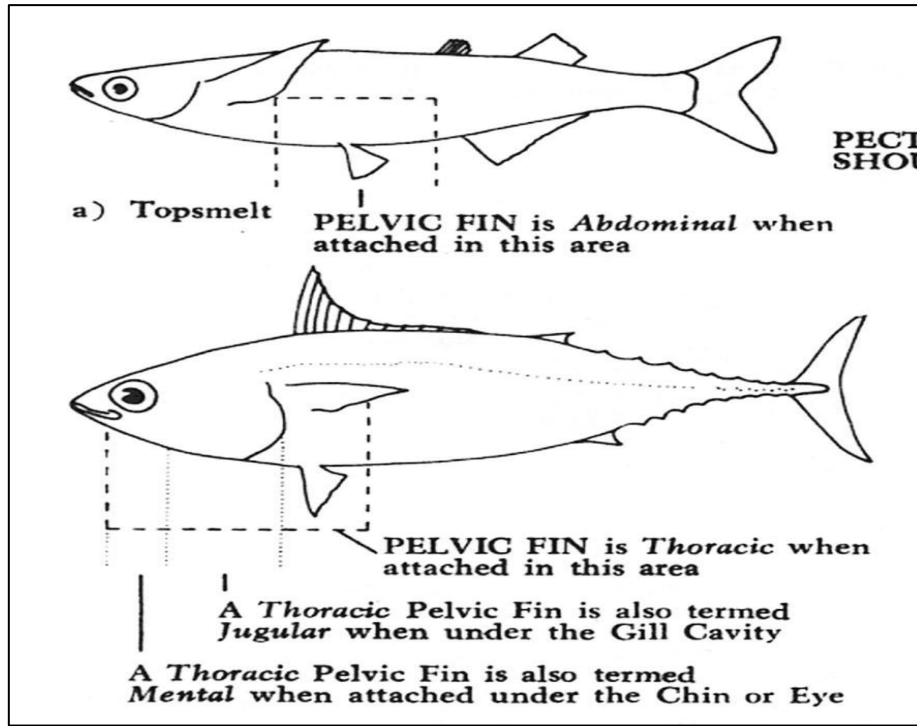
- Position relative to body:

(dorso-lateral / median / Ventro-lateral)

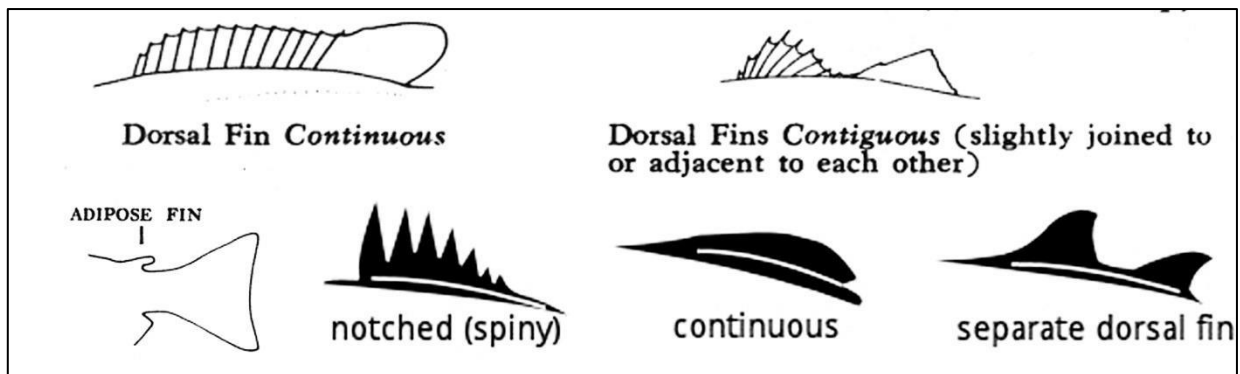


pelvic fins

- (fin rays with spines or not) - size
- (position to pectoral : Thoracic / Abdominal)



single : dorsal fin: (One or two parts) finny / adipose
(fin rays provided with spines or not)



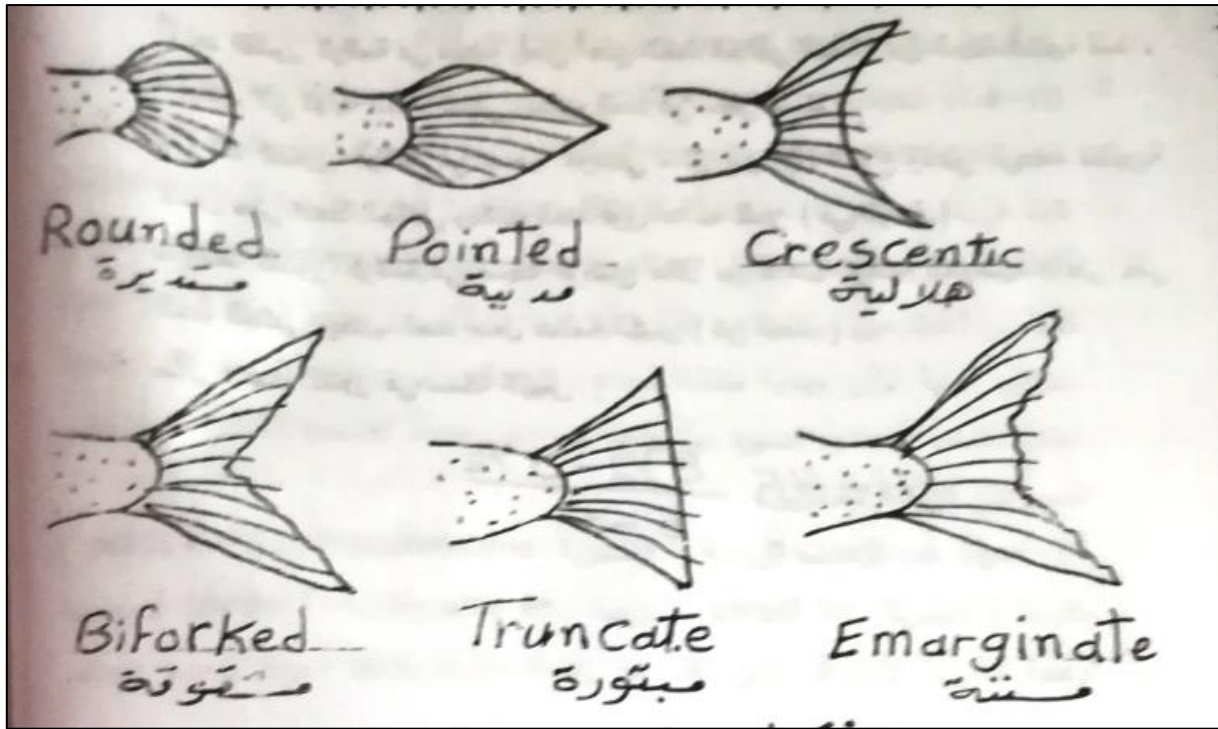
Anal (ventral) fin: (size - with spines or not)

caudal fin:

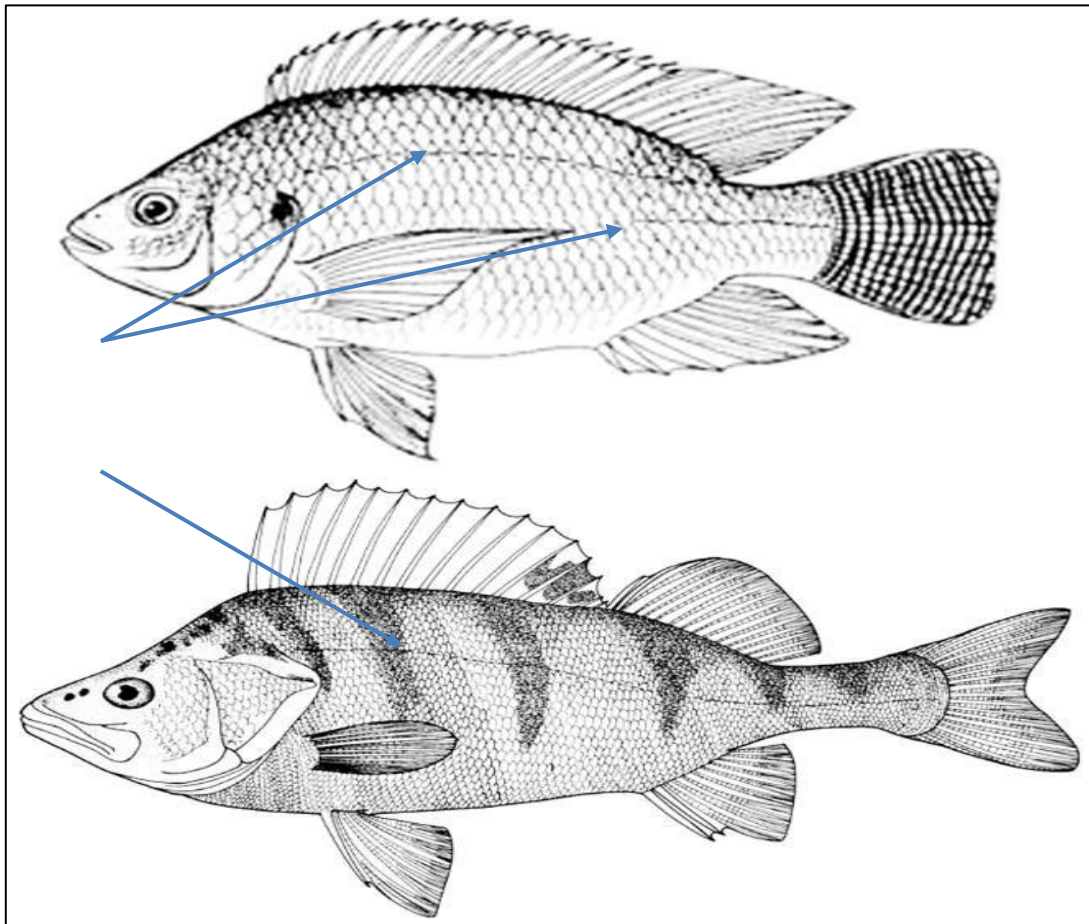
1- Heterocercal “**cartilaginous fishes**”

2- Homocercal “**Bony fishes**”

(Biforked, truncate, rounded, Crescentic, ...etc.)



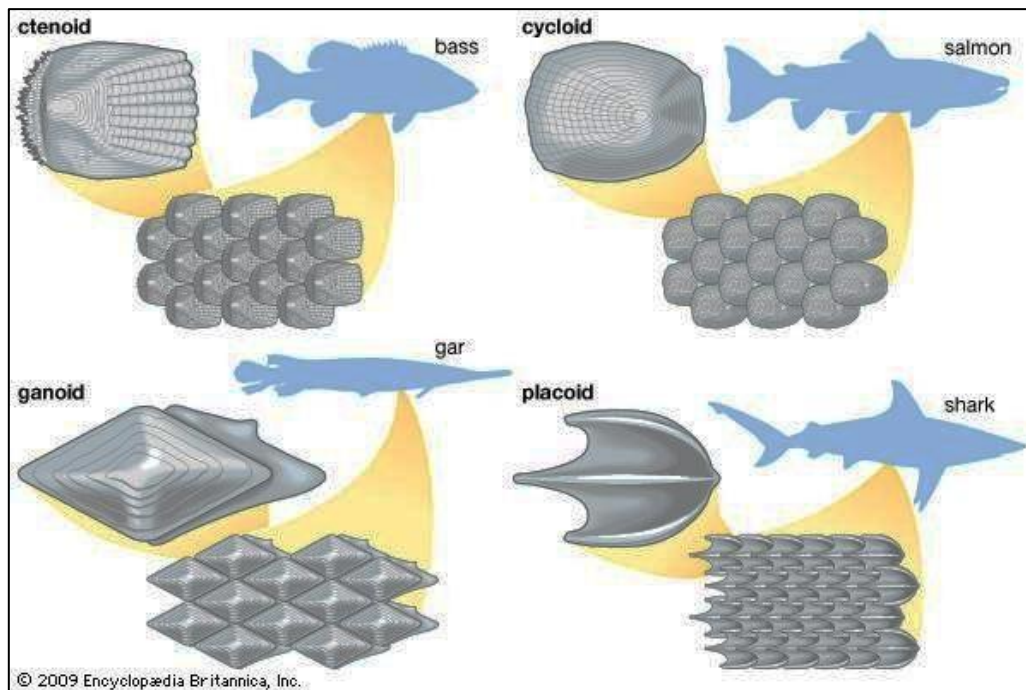
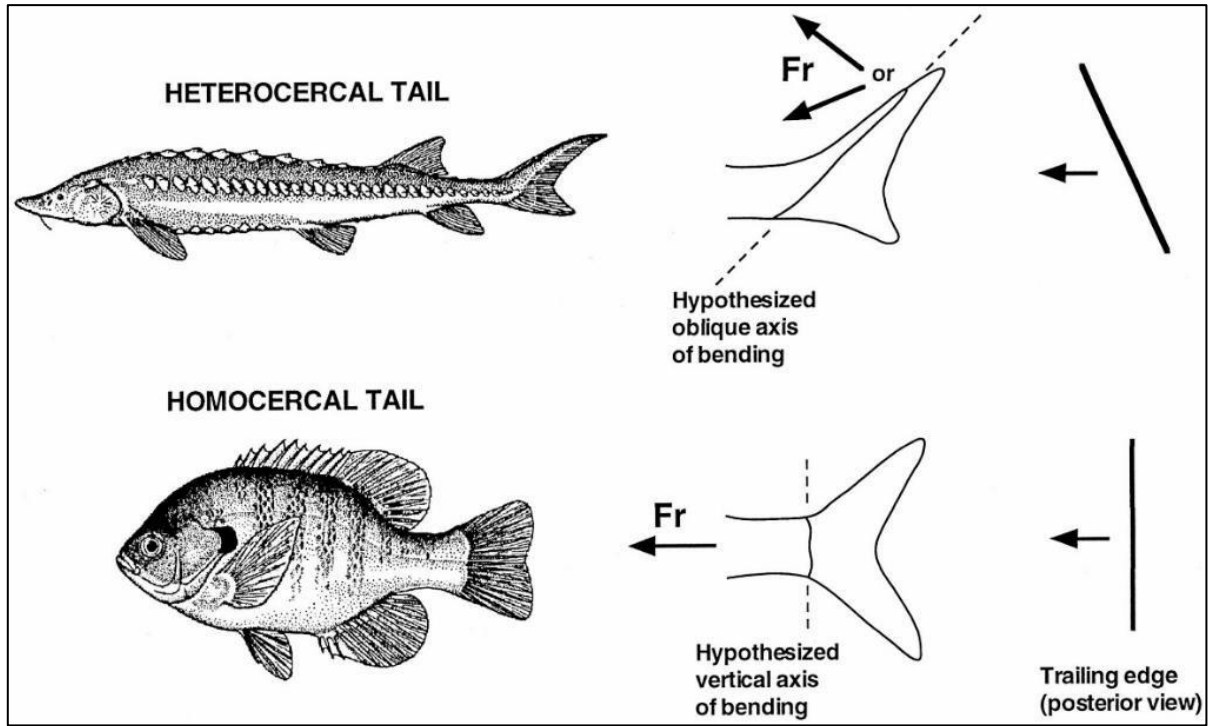
d- Lateral line (one or two on each side)



6- **Tail:** (homogeneous / heterogeneous)

- size (small - medium - large)

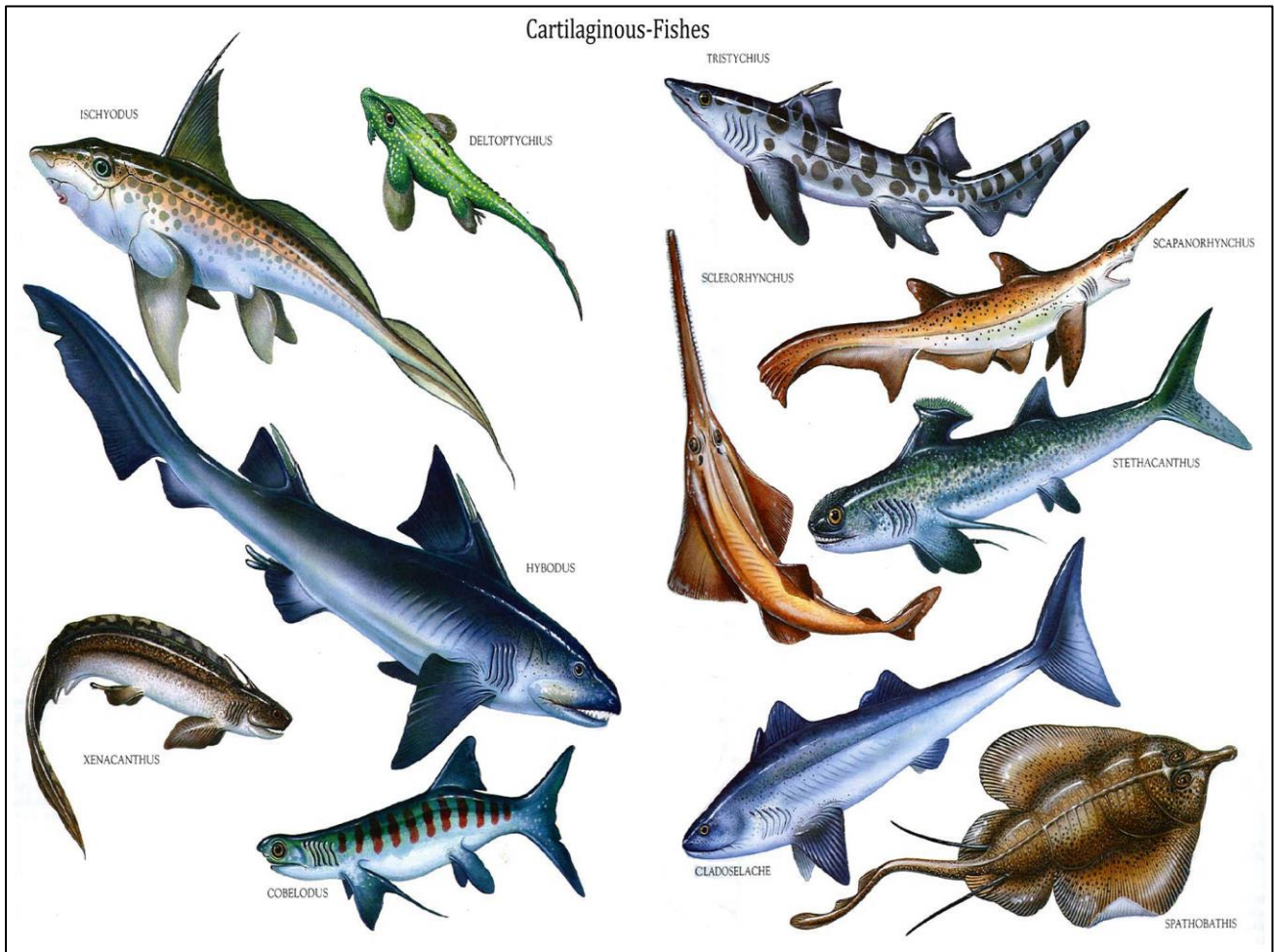
- shape (cylindrical - dorsoventrally dep. - bilaterally comp.)



7- **Comment:** (Habitat - Nutrition - Adaptation - Reproduction).

Cartilaginous fishes

Class: Chondrichthyes



Kingdom : Animalia
Subkingdom: Eumetazoa
Phylum : Chordata
Subphylum: Vertebrata
Superclass : Gnathostomata
Class : **Chondrichthyes**

❖ **Example 1:** *Scyliorhinus canicula*

كلب السمك

Class : Chondrichthyes

Subclass : Elasmobranchii (Selachii) صفائح الخياشيم

Order : Pleurotremata جانبية الخياشيم

Family : Scyliorhinidae

e.g. : *Scyliorhinus canicula*



❖ **Example 2:** *Rhinobatus granulatus*

المحراث

Class : Chondrichthyes

Subclass : Elasmobranchii (Selachii) صفائية الخياشيم

Order : Hypotremata بطنية الخياشيم

Family : Rhinobatidae

e.g. : *Rhinobatus granulatus*



Bony fishes

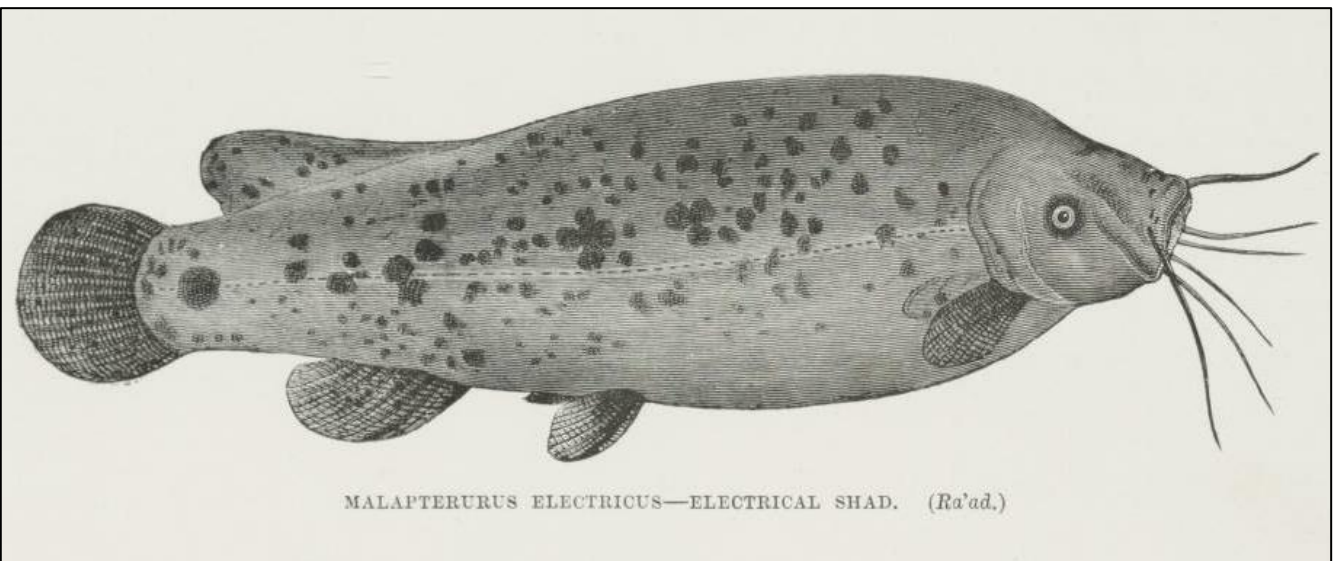
Class: Osteichthyes



Kingdom : Animalia
Subkingdom: Eumetazoa
Phylum : Chordata
Subphylum: Vertebrata
Superclass : Gnathostomata
Class : **Osteichthyes**

❖ **Example 1:** *Malapterurus electricus* الرعاش

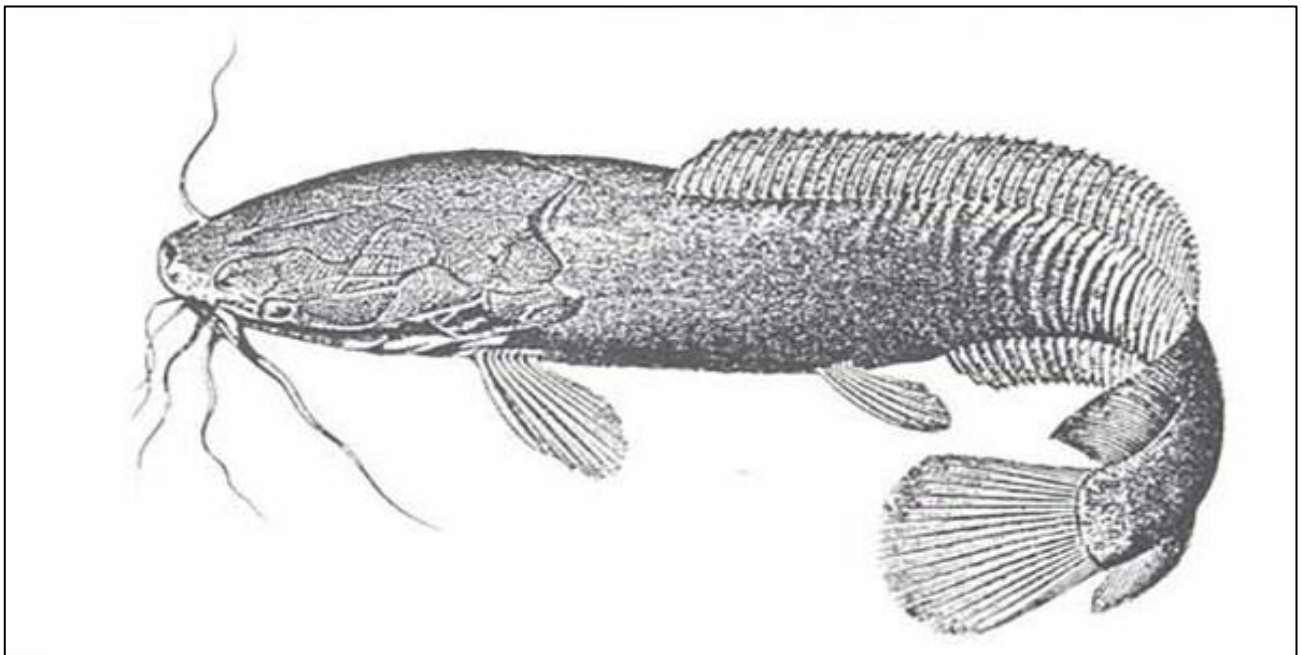
Class : Osteichthyes
Subclass : Actinopterygii
Superorder : Teleostei
Order : Siluriformes
Family : Malapteruridae
e.g. : *Malapterurus electricus*



❖ **Example 2:** *Clarias lazera*

القرموط

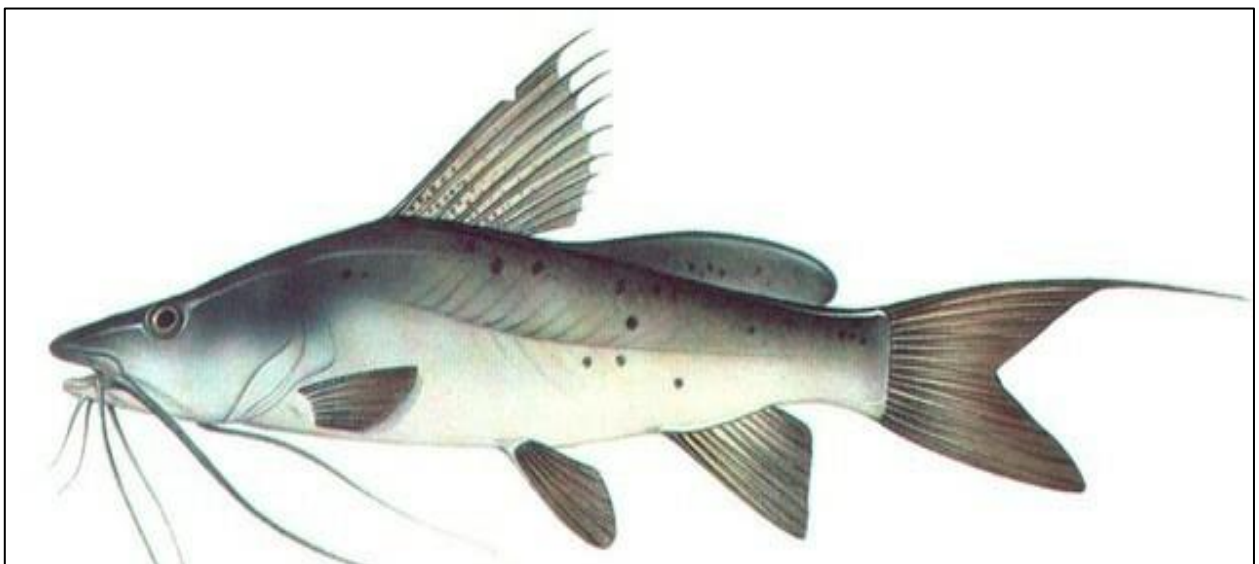
Class : Osteichthyes
Subclass : Actinopterygii
Superorder : Teleostei
Order : Siluriformes
Family : Clariidae
e.g. : *Clarias lazera*



❖ **Example 3:** *Bagrus bayad*

البياض

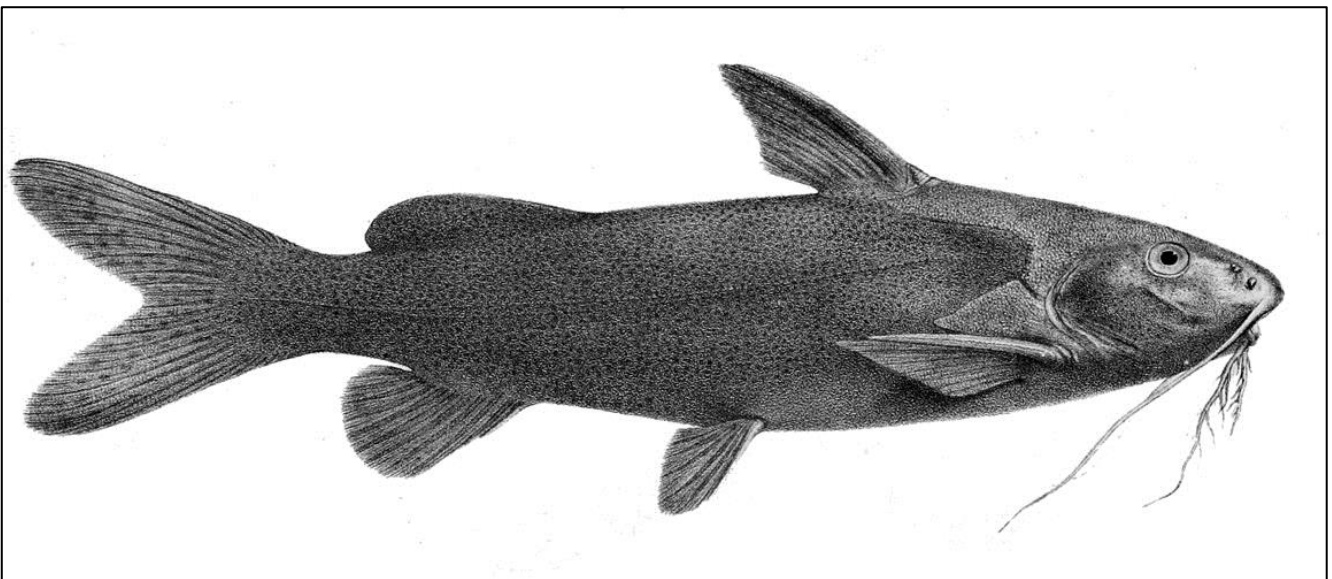
Class : Osteichthyes
Subclass : Actinopterygii
Superorder : Teleostei
Order : Siluriformes
Family : Bagridae
e.g. : *Bagrus bayad*



Example 4: *Synodontis schall*

الشال

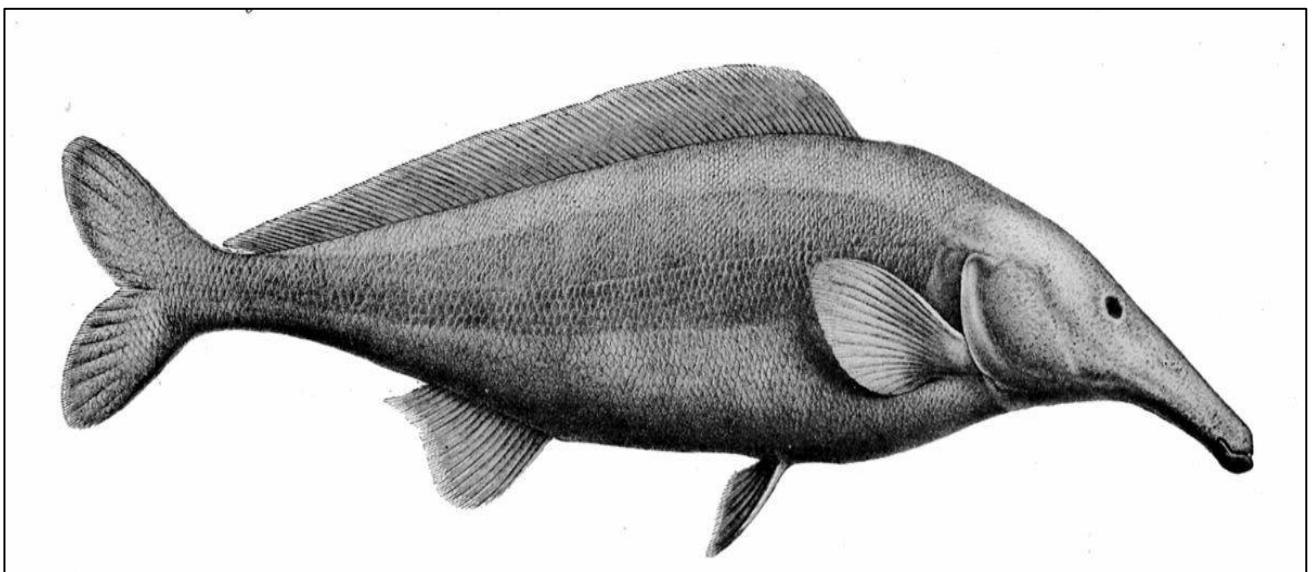
- Class : Osteichthyes
- Subclass : Actinopterygii
- Superorder : Teleostei
- Order : Siluriformes
- Family : Mochokidae
- e.g. : *Synodontis schall*



Example 5: *Mormyrus kannume*

القنومة

- Class : Osteichthyes
Subclass : Actinopterygii
Superorder : Teleostei
Order : Osteoglossiformes
Family : Mormyridae
e.g. : *Mormyrus kannume*



❖ **Example 6:** *Trigla sp.*

الفرخة

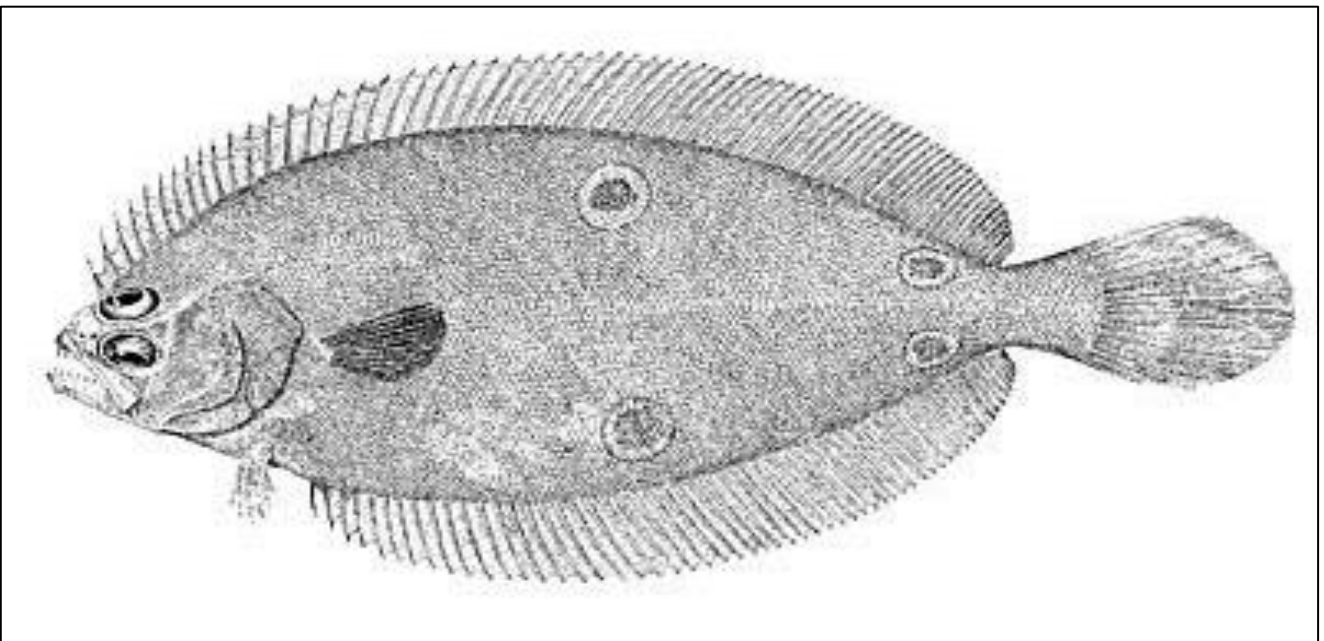
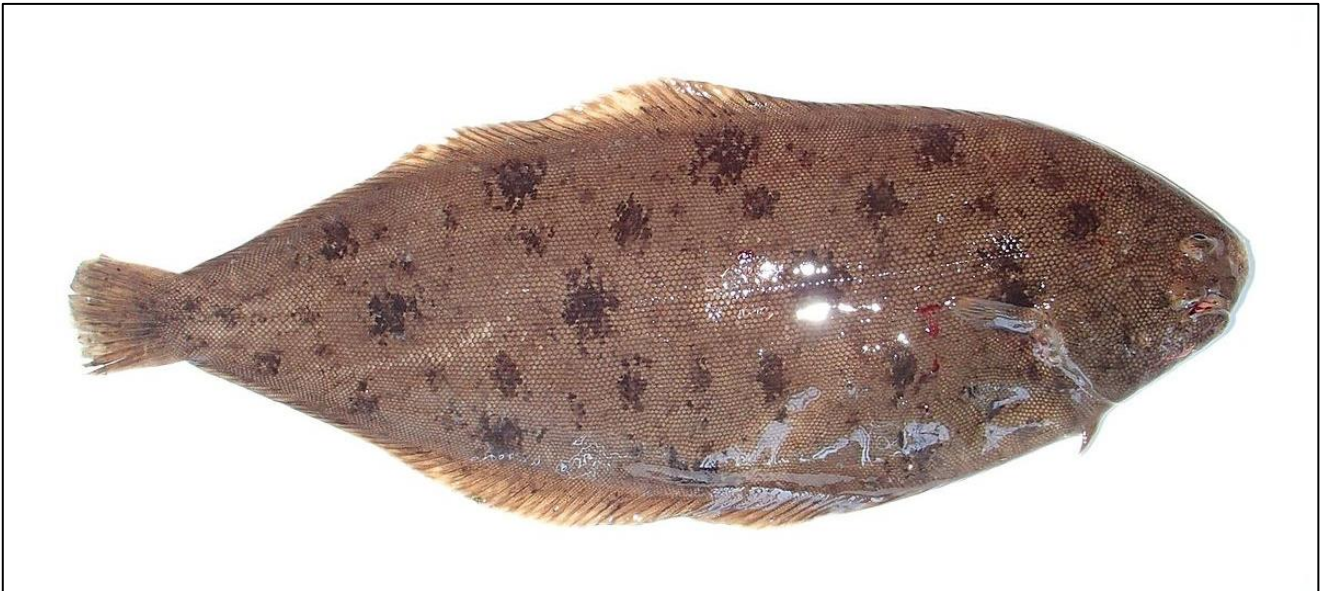
Class : Osteichthyes
Subclass : Actinopterygii
Superorder : Teleostei
Order : Antheriniformes (Percimorphi)
Family : Triglidae
e.g. : *Trigla sp.*



❖ **Example 7:** *Soleia sp.*

سمكة موسى

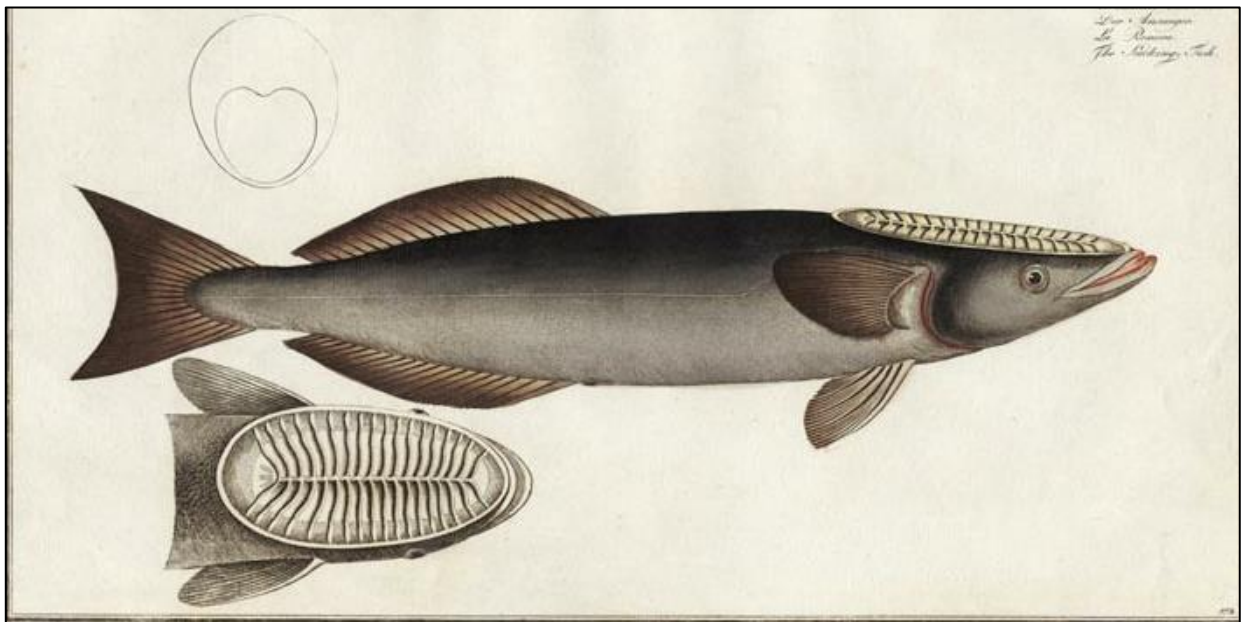
- Class : Osteichthyes
Subclass : Actinopterygii
Superorder : Teleostei
Order : Pleuronectiformes (Heterostomata)
Family : Soleidae
e.g. : *Soleia sp.*



❖ **Example 8:** *Echeneis remora*

الريمورا "قملة الدرفيل"

- Class : Osteichthyes
Subclass : Actinopterygii
Superorder : Teleostei
Order : Perciformes (Discocephali)
Family : Echeneidae
e.g. : *Echeneis remora*



❖ **Example 9:** *Anguilla vulgaris*

ثعبان السمك

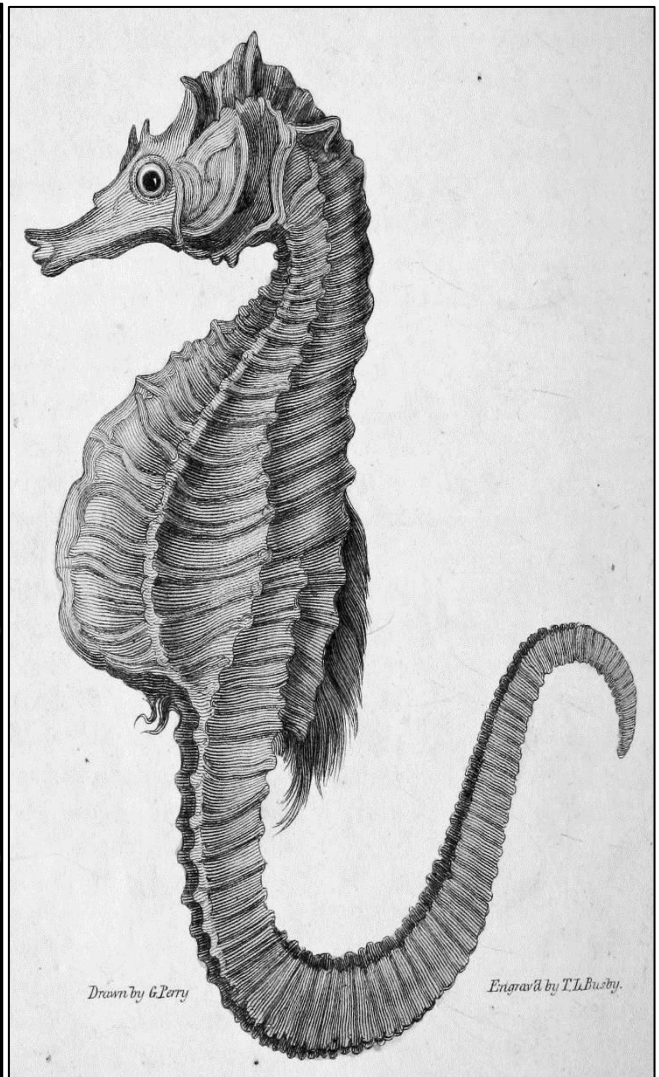
- Class : Osteichthyes
Subclass : Actinopterygii
Superorder : Teleostei
Order : Anguilliformes
Family : Anguillidae
e.g. : *Anguilla vulgaris*



❖ **Example 10:** *Hippocampus sp.*

حصان البحر

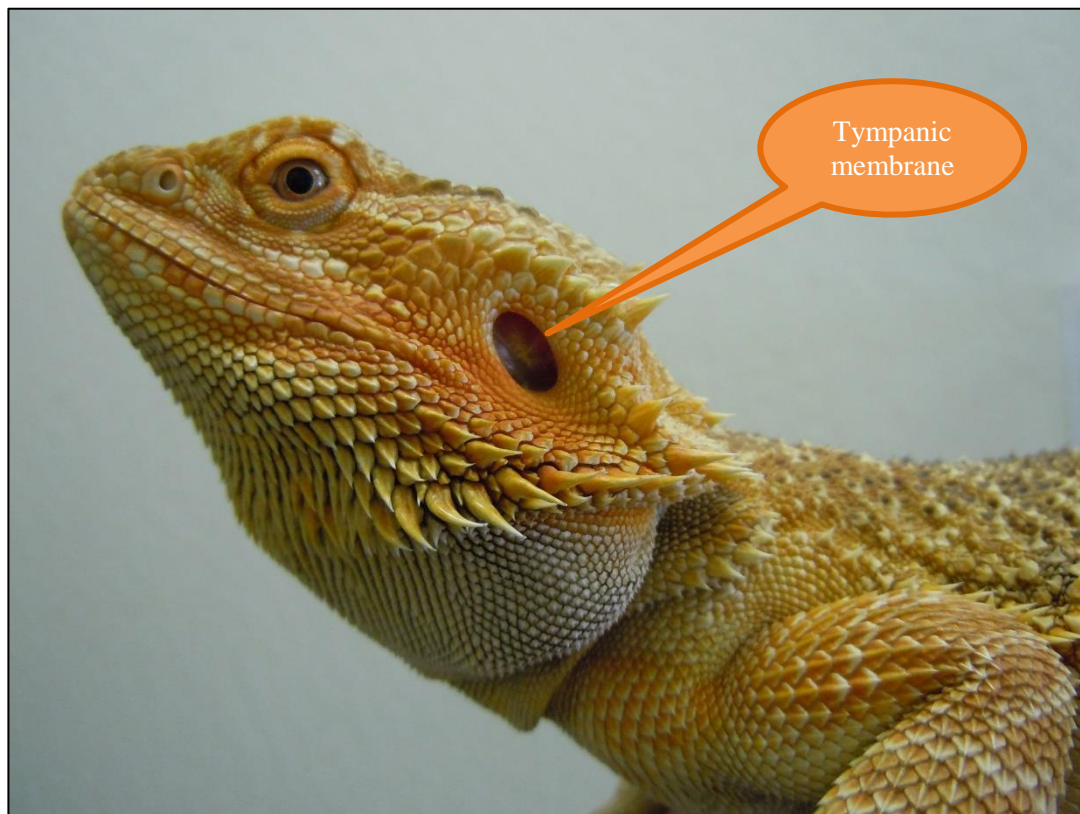
Class : Osteichthyes
Subclass : Teleostei
Order : Syngnathiformes
Family : Syngnathidae
e.g. : *Hippocampus sp.*



Reptiles

Reptile description key:

- 1- **Body shape:** - Cylindrical
- Dorsoventrally depressed (from top to bottom)
- Bilaterally compressed (from side to side)
- 2- **Body colour:** (Dorsal surface - Ventral surface)
- 3- **Scales:** (Present - Absent)
if present: Large / small
- ❖ **Body regions (Head, neck, trunk, tail):**
- 4- **Head:**
 - a- size (small - medium - large)
 - b- shape (cylindrical - dorsoventrally dep. - bilaterally comp.)
(**Triangular** مثلثة - **cordate** قلبية الشكل)
 - c- eyes (size - shape “round/oval” - position on the head)
 - d- mouth:
 - position (terminal mostly)
 - size (narrow - wide)
 - teeth (present - absent)
 - e- nostrils: (one on each side - size)
 - f- **Tympanic membrane:** (as a cleft - covered with scales)
- 5- **Neck:** (long - short)
- 6- **Trunk:**
 - a- Fore limbs (Weak – strong) / (Number of fingers)
(Claws “weak-strong”)
 - b- Hind limbs (Weak – strong) / (Number of fingers)
(Claws “weak-strong”)
 - c- Length: (Front limb to Hind limb “longer/shorter/equal”)
 - d- Cloacal opening: (longitudinal - transverse)
- 7- **Tail:** (the tail is “longer - shorter - equal” to the rest of the body)
- 8- **Comment:** (Habitat - Nutrition - Adaptation - Reproduction).



Reptiles

Class: Reptilia



Kingdom : Animalia
Subkingdom: Eumetazoa
Phylum : Chordata
Subphylum : Vertebrata
Superclass : Gnathostomata
Class : **Reptilia**

❖ **Example 1:** *Hemidactylus turcicus*

البرص المنزلي

Class : Reptilia
Subclass : Diapsida
Order : Squamata
Suborder : Lacertilia
Family : Gekkonidae
e.g. : *Hemidactylus turcicus*



❖ **Example 2:** *Chalcides ocellatus*

الدفان الكبير

Class : Reptilia
Subclass : Diapsida
Order : Squamata
Suborder : Lacertilia
Family : Scincidae
e.g. : *Chalcides ocellatus*



❖ **Example 3:** *Mabuya quinquetaeniata* سحلية الحدائق

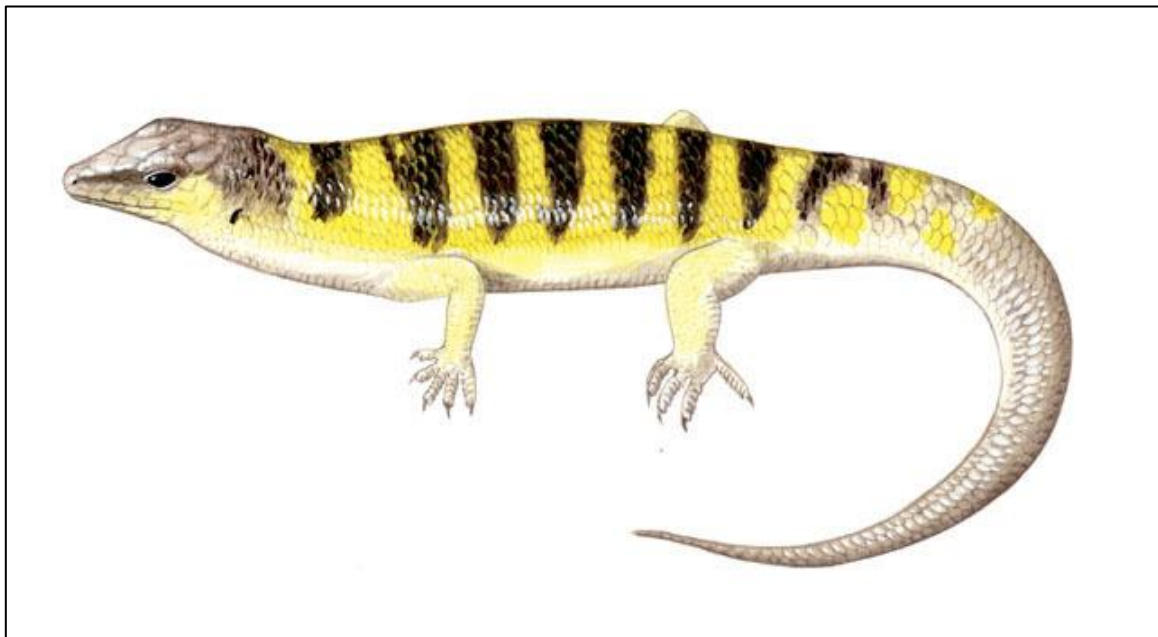
Class : Reptilia
Subclass : Diapsida
Order : Squamata
Suborder : Lacertilia
Family : Scincidae
e.g. : *Mabuya quinquetaeniata*



❖ **Example 4:** *Scincus scincus*

السقنقور

Class : Reptilia
Subclass : Diapsida
Order : Squamata
Suborder : Lacertilia
Family : Scincidae
e.g. : *Scincus scincus*



❖ **Example 5:** *Agama stellio*

الحدرون

Class : Reptilia
Subclass : Diapsida
Order : Squamata
Suborder : Lacertilia
Family : Agamidae
e.g. : *Agama stellio*



❖ **Example 6:** *Uromastyx aegyptia*

الضب المصري

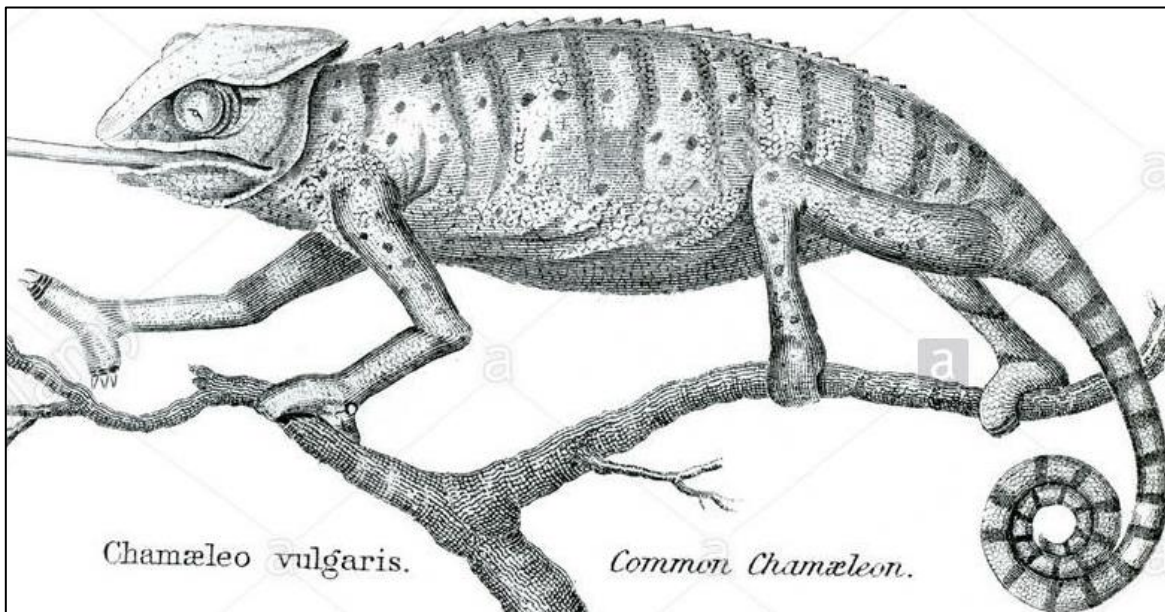
Class : Reptilia
Subclass : Diapsida
Order : Squamata
Suborder : Lacertilia
Family : Agamidae
e.g. : *Uromastyx aegyptia*



❖ **Example 7:** *Chamaeleon vulgaris*

الحرباء

Class : Reptilia
Subclass : Diapsida
Order : Squamata
Suborder : Rhiptoglossa
Family : Chamaeleonidae
e.g. : *Chamaeleon vulgaris*



❖ **Example 8:** *Cerastes cerastes*

الأفعى المقرنة

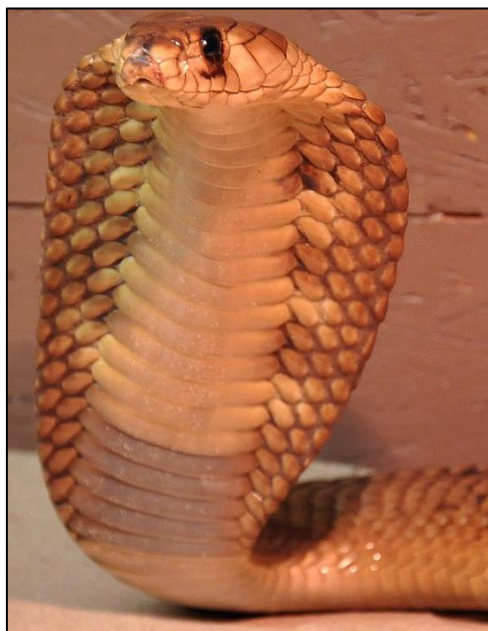
Class : Reptilia
Subclass : Diapsida
Order : Squamata
Suborder : Ophidia
Family : Viperidae
e.g. : *Cerastes cerastes*



❖ **Example 9:** *Naja haje*

الناشر المصري "الكوبرا"

Class : Reptilia
Subclass : Diapsida
Order : Squamata
Suborder : Ophidia
Family : Colubridae
e.g. : *Naja haje*



❖ **Example 10:** *Testudo leithi*

السلحفاة الأرضية

Class : Reptilia
Subclass : Anapsida
Order : Chelonia
Family : Testudinidae
e.g. : *Testudo leithi*



Birds

Birds description key:

- 1- **Body shape:** (Spindle-shape)
- 2- **Feather colour:** (Dorsal surface - Ventral surface - lateral sides)
(if it has several colors, each part is mentioned)

Body regions (Head, neck, trunk, tail)

- 3- **Head:**
 - a- size: (small - medium - large)
 - b- shape: (mostly rounded)
 - c- eyes: (size - shape “round/oval” - position on the head)
 - d- mouth: - surrounded by horny beak (V-shaped)
- size: (small - medium - large)
- teeth: absent
 - e- Beak: - (blunt - sharp)
- (strong- weak)
- (straight - curved)
 - f- nostrils: (one on each side on dorsal side of beak - size - shape)
 - g- ear opening: (appeared clearly - covered with feathers)
- 4- **Neck:** is cylindrical and flexible: (long - short) / (thin - thick)
- 5- **Trunk:** (Generally compact and spindle-shaped)
Size: (small - medium - large)
 - a- Fore limbs (modified into wings)
- size: (small - medium - large)
- feather length: (long - short)
 - b- Hind limbs (Normal legs for walking, swimming, & perching)
- digits: (number - size - with membrane or not)
- claws: (weak-strong) / (sharp - blunt)
 - c- Cloacal opening: (longitudinal - transverse)
- 6- **Tail:** (the tail is small with two oil glands)

Comment: (Habitat - Nutrition - Adaptation - Reproduction).

Birds

Class: Aves



Kingdom : Animalia
Subkingdom: Eumetazoa
Phylum : Chordata
Subphylum: Vertebrata
Superclass : Gnathostomata
Class : **Aves**

❖ **Example 1:** *Columba livia domestica* الحمامة المنزلية

Class : Aves
Subclass : Neornithes
Order : Columbiformes
Family : Columbidae
e.g. : *Columba li via domestica*



❖ **Example 2:** *Upopa epops major*

الهدد

- Class : Aves
Subclass : Neornithes
Order : Coraciiformes
Family : Upupidae
e.g. : *Upopa epops major*



❖ **Example 3:** *Falco tinnunculus*

العوسق المصري

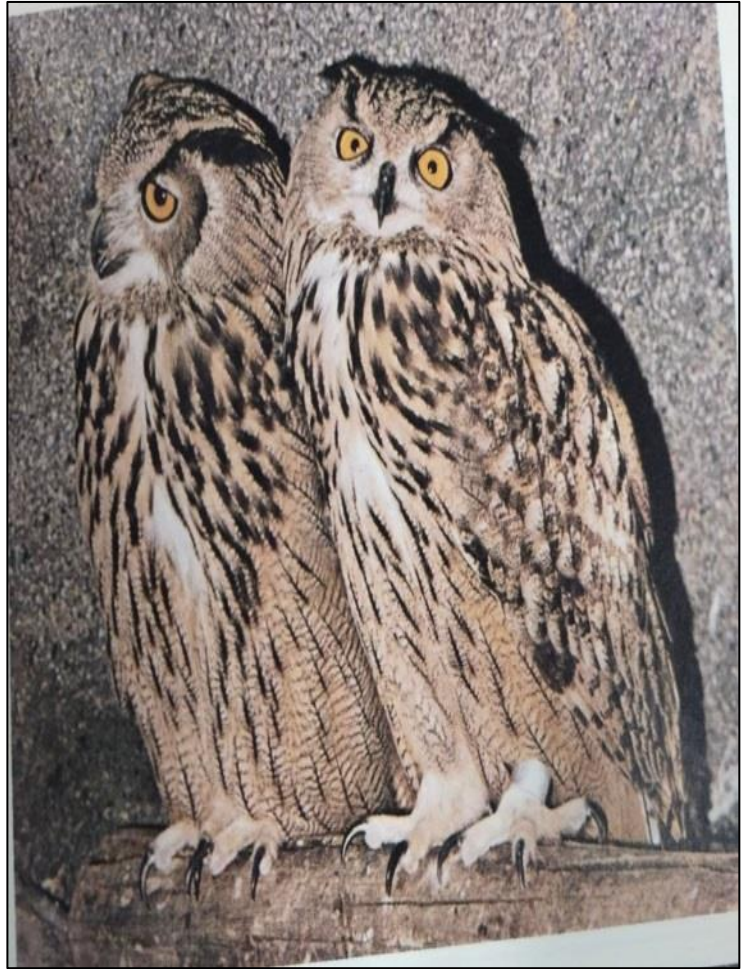
Kingdom : Animalia
Subkingdom: Eumetazoa
Phylum : Chordata
Subphylum: Vertebrata
Class : Aves
Subclass : Neornithes
Order : Falconiformes
Family : Falconidae
e.g. : *Falco tinnunculus*



❖ **Example 4:** *Bobu ascalaphus*

البومة المقرنة

Class : Aves
Subclass : Neornithes
Order : Strigiformes
Family : Strigidae
e.g. : *Bobu ascalaphus*



Example 5: *Bubulcus ibis ibis*

أبو قردان

Class : Aves
Subclass : Neornithes
Order : Pelecaniformes
Family : Ardeidae
e.g. : *Bubulcus ibis ibis*



❖ **Example 6:** *Ceryle rudis*

صياد السمك الأبقع

Class : Aves
Subclass : Neornithes
Order : Coraciiformes
Family : Alcedinidae
e.g. : *Ceryle rudis*



❖ **Example 7:** *Larus ridibundus*

النورس أسود الرأس

Class : Aves
Subclass : Neornithes
Order : Charadiformes
Family : Laridae
e.g. : *Larus ridibundus*



❖ **Example 8:** *Corvus corone sardonius* الغراب أبو برنس

Class : Aves
Subclass : Neornithes
Order : Passeriformes
Family : Corvidae
e.g. : *Corvus corone sardonius*



Mammals

Mammals description key:

- 1- **Body shape & size:** (elongated anteriorly, broad posteriorly)
- 2- **Hair colour:** (Dorsal surface - Ventral surface - lateral sides)
(if it has several colors, each part is mentioned)

Body regions (Head, neck, trunk, tail)

- 3- **Head:**
 - a- size: (small - medium - large)
 - b- shape: (mostly rounded or oval)
 - c- eyes: (size - shape “round/oval” - position on the head)
 - d- mouth: - surrounded by fleshy lips شفاه لحمية
- size: (small - medium - large)
- position: (terminal - subterminal)
- shape: (crescentic - transverse slit-like)
- teeth: (present - absent)
 - e- nostrils: (one on each side on dorsal side of mouth - size - shape)
 - f- ear: surrounded by (movable - immovable) pinna صوان الاذن
 - 4- **Neck:** is cylindrical and flexible: (long - short) / (thin - thick)
 - 5- **Trunk:** (Generally compact and spindle-shaped)
Size: (small - medium - large)
 - a- Fore limbs (Hands)
- size: (small - medium - large)
- digits: (number - size - with membrane or not)
- claws: (weak-strong) / (sharp - blunt)
 - b- Hind limbs
- digits: (number - size - with membrane or not)
- claws: (weak-strong) / (sharp - blunt)
 - c- Cloacal opening: (longitudinal - transverse)
 - 6- **Tail:** (Cylindrical) / (long - short) / (straight - curved)
- Comment:** (Habitat - Nutrition - Adaptation - Reproduction).

Mammals

Class: Mammalia



Kingdom : Animalia
Subkingdom: Eumetazoa
Phylum : Chordata
Subphylum: Vertebrata
Superclass : Gnathostomata
Class : **Mammalia**

❖ **Example 1:** *Felis catus*

القط المنزلي

Class : Mammalia
Subclass : Eutheria
Order : Carnivora
Family : Felidae
e.g. : *Felis catus*



❖ **Example 2:** *Cavia porcellus*

خنزير غينيا

Class : Mammalia
Subclass : Eutheria
Order : Rodentia
Family : Caviidae
e.g. : *Cavia porcellus*



❖ **Example 3:** *Martes foina*

العرسة المنزلية

Class : Mammalia
Subclass : Eutheria
Order : Carnivora
Family : Mustelidae
e.g. : *Martes foina*



❖ **Example 4:** *Oryctolagus cuniculus* الأرنب

Class : Mammalia
Subclass : Eutheria
Order : Lagomorpha
Family : Leporidae
e.g. : *Oryctolagus cuniculus*



❖ **Example 5:** *Cercopithecus aethiops*

القرد الأفريقي

Class : Mammalia
Subclass : Eutheria
Order : Primata
Family : Cercopithecidae
e.g. : *Cercopithecus aethiops*

