UNIT IV

MICROSCOPY AND STERILIZATION

INTRODUCTION

- 3. PRESENCE OF PHARYNGEAL GILL SLITS: Gill slits are present on either side of the pharynx. Each gill slit develops in the embryonic stage by evaginations of endoderm in pharynx with a corresponding invagination of ectoderm on the outside of the body. They are useful for respiration. In reptiles, birds and mammals, there are several pairs of gill slits in embryonic life, but they are not functional hence they are closed.
- 4. TRLPLOBLASTIC NATURE
- They possess three germ layers, 1. Ectoderm, 2. Mesoderm, 3. Endoderm.

- 5. DEVELOPMENT OF TRUE COELOME: In all the chordates a true coelom is present. It develops from mesoderm. The coelom is developed by enterocoelic method.
- 6. PRESENCE OF BILATERAL SYMMETRY: The body of the chordates show bilateral symmetry. Their body can be divided into two equal halves, through a sagittal plane which passé longitudinally.No chordate animal possesses ideal bilateral symmetry, but they are near to such condition.
- 7. REDUCTION OF METAMERIC SEGMENTATION: Among the chordates, metamerism is seen in the internal structures. The myomeres are seen in lower chordates and segmentation is seen in the embryonic condition of higher vertebrates.

PROTOCHORDATA

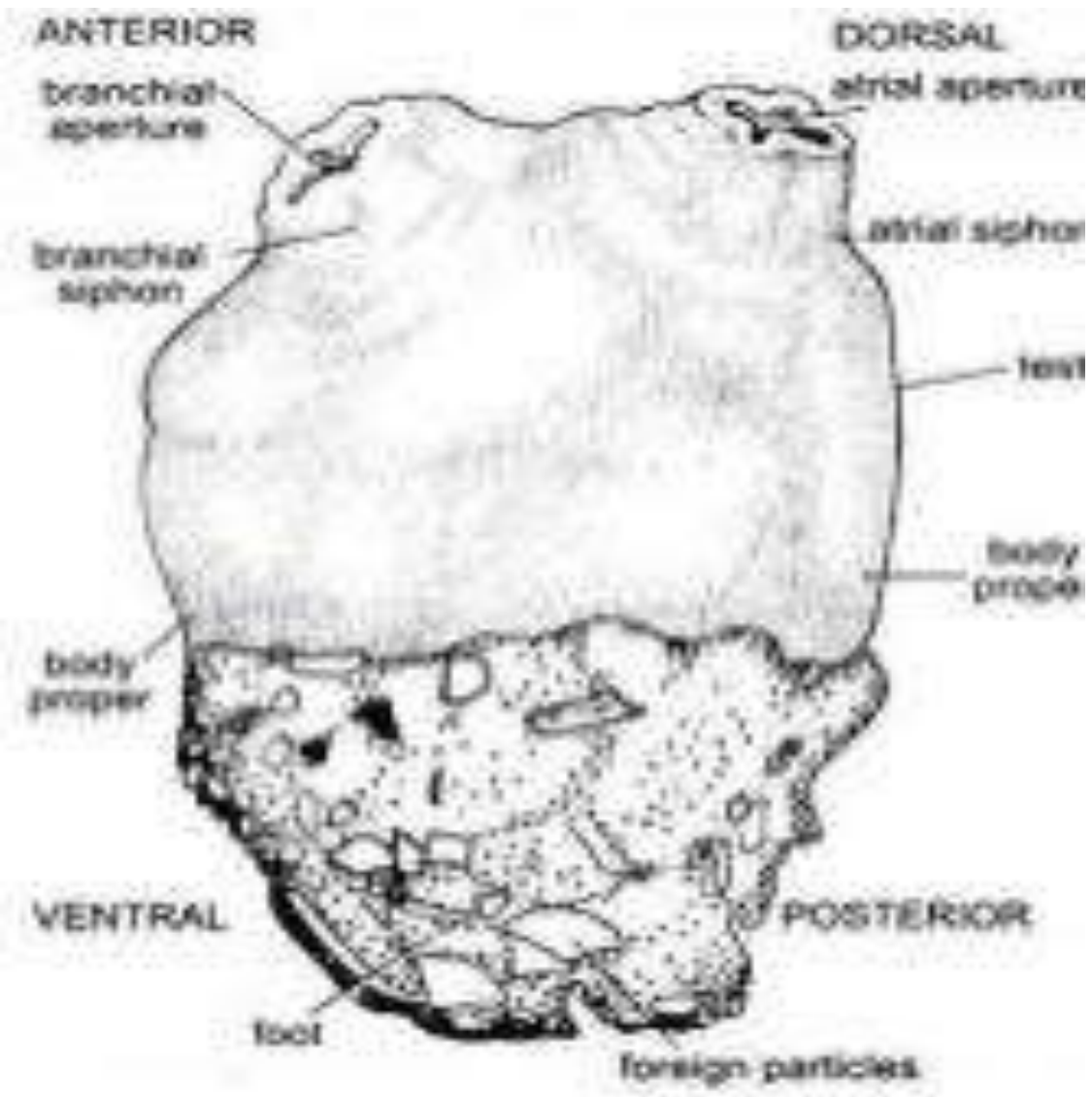
IDENTIFICATION: Herdmania

: Phylum : Chordata

. sub-phylum : Urochordata

. Class : Ascidiacea

. Genus : Herdmania

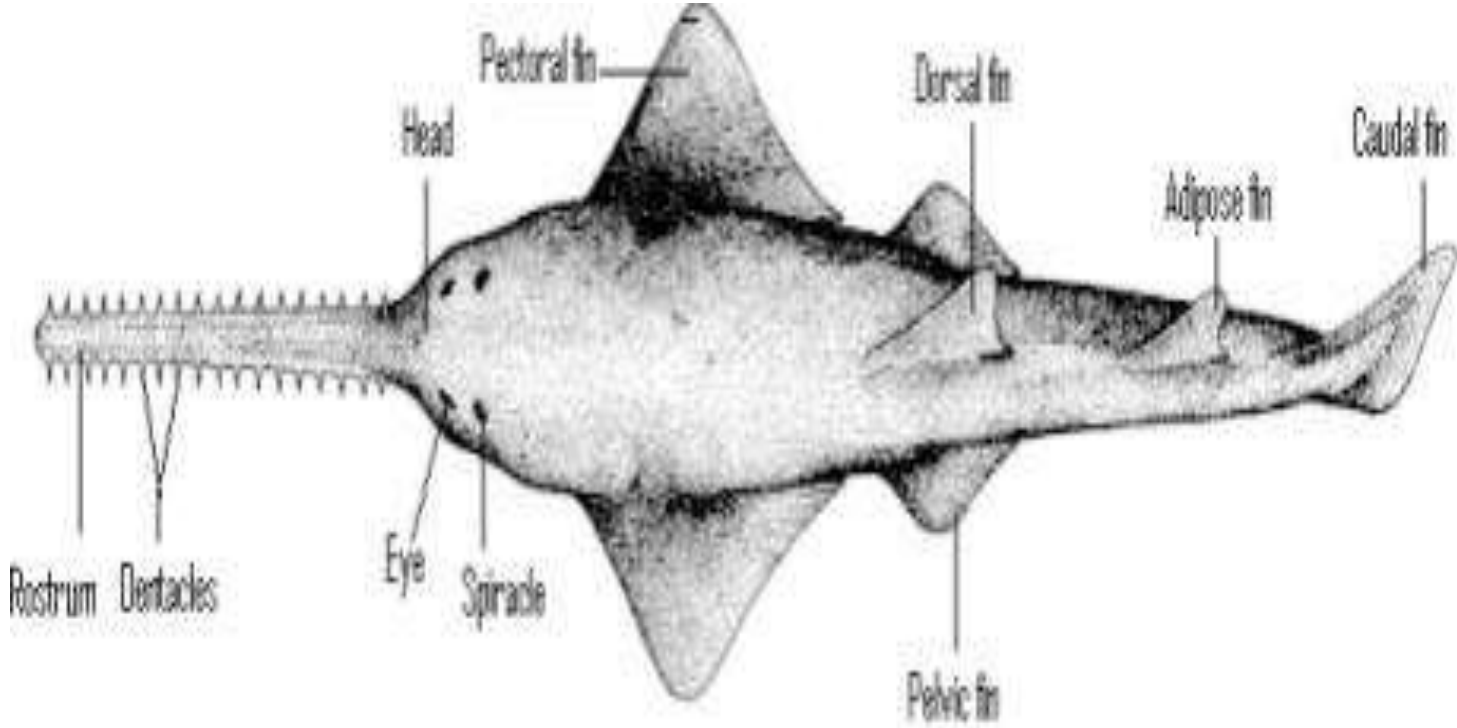


Comments

- 1. Herdmania is a simple ascidian.
- 2. Herdmania is a marine and sedentary animal. It is fixed to rocky substratum by a flat base. When it is disturbed, it suddenly contracts its body, and emits inner contents with force through its apertures. Hence it is called Sea squirt.
- 3. It is potato like in shape. It is pink in colour.
- 4. On the free side, body shows two projections, the branchial and atrial siphons. The branchial siphon is short. The branchial siphon shows a branchial aperture or the mouth. The atrial siphon is longer. It bears the atrial aperture. Both the openings are bounded by four lips.
- 5. The body of this animal is covered and protected by test. It is a thick, leathery covering of the body. It is secreted by the epidermis of the body wall. It has matrix, corpuscles, fibrils, blood vessels and spicules.

Pisces

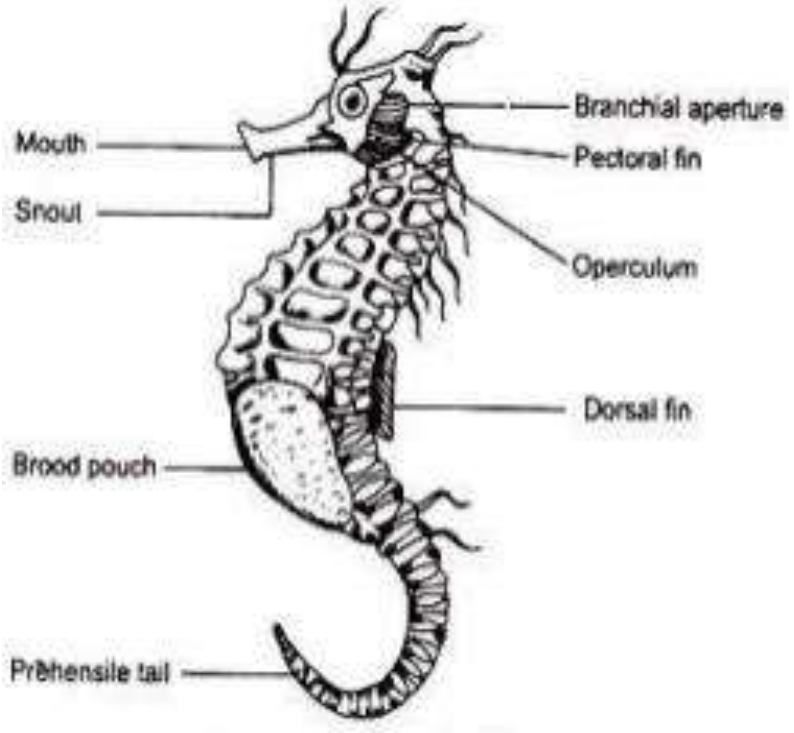
- IDENTIFICATION: Pristis (Saw Fish)
- CLASSIFICATION:
- Phylum : Chordata
- Class : Chondrichthyes
- Order : Selachii
- Genus : Pristis



Comments

- 1. It is found in Mediterranean and Atlantic Ocean.
- 2. Elongated body, shark like.
- 3. Head and skull prolongated into a long-flattened rostrum lateral margin of which is provided with a series of short tooth like denticles giving it the appearance of saw; hence it’s called SAW FISH.
- 4. Tentacles in the rostrum are absent.
- 5. Spiracles (Respiratory openings) are present behind the eyes.
- 6. Dorsal fins are large.
- 7. Well-developed tail with terminating heterocercal caudal fin.

- IDENTIFICATION: Hippocampus (Sea Horse)
- CLASSIFICATION:
- Phylum : Chordata
- class : Osteichthyes
- order : Syngnathiformes
- Genus : Hippocampus

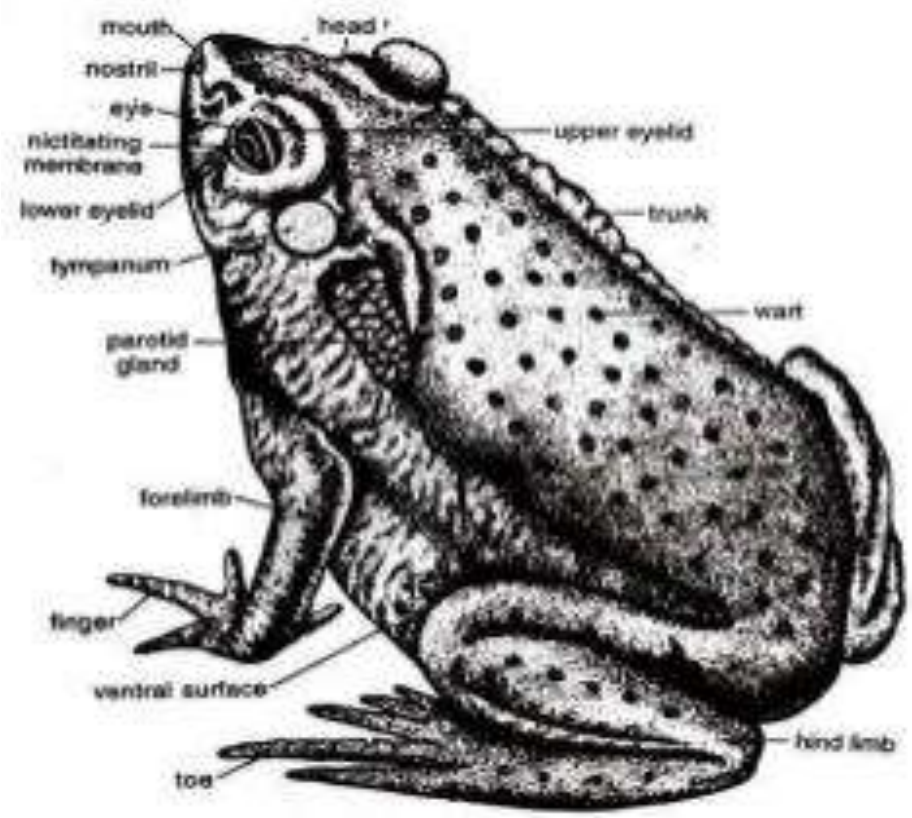


Comments

- 1. It is found in Indian and Atlantic seas.
- 2. Elongated body with an exoskeleton of rings.
- 3. Both jaws are prolonged into a long snout.
- 4. Mouth is present at the extremity of an elongated tubular snout.
- 5. Elevated trunk is compressed with 10-12 rings.
- 6. Pectoral and dorsal fins are small.
- 7. Pelvic and caudal fins are absent.
- 8. Tail is Prehensile and used for coiling around the sea weeds9. Operculum is fused with the body wall ventrally and posteriorly leaving a small upwardly directed branchial aperture.10.Sexes are separate. Male possess a brood pouch on the abdomen. In the brood pouch eggs are retained until they hatch as young ones.11.It swims always in a vertical position by undulation of dorsal fin and exhibits mimicry by having numerous prominent spines.

Amphibia

- IDENTIFICATION: Bufo melanostictus
- CLASSIFICATION:
- Phylum : Chordata
- Class : Amphibia
- Order : Anura
- Genus : Bufo
- species : melanostictus



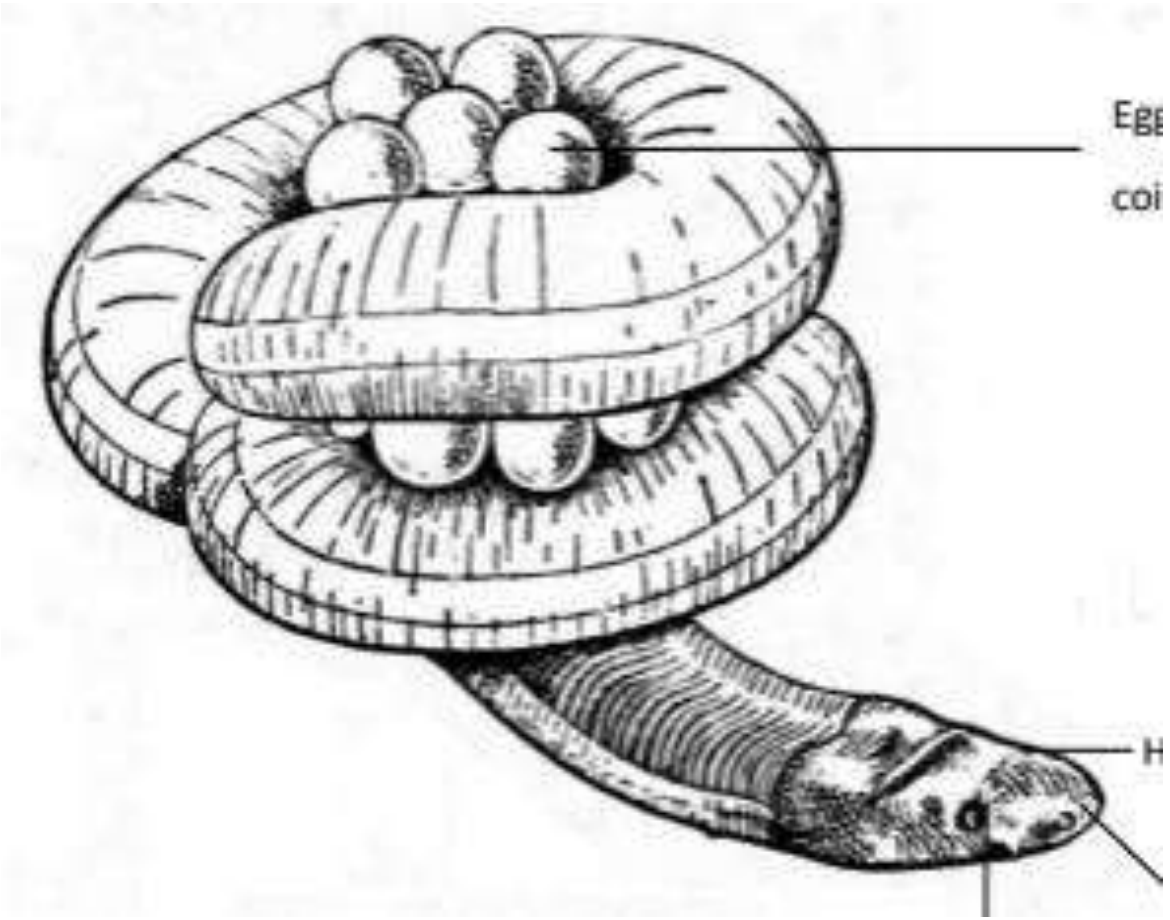
Comments

- 1. Bufo is terrestrial and nocturnal in habit.
- 2. Rough skin, dry, and warty on the dorsal surface.
- 3. Eyes are large and nostrils are very small.
- 4. Well-developed Tympanum.
- 5. Paired parotoid glands (which secretes irritating poisonous fluid) are present behind the tympanum.
- 6. Fore-limbs bear three webless fingers and a thumbpad that assists in copulation.
- 7. Hind limbs have three toes with a greatly reduced web (owing to the greater terrestrial habitat).8. Teeth are entirely absent.

- IDENTIFICATION: Ichthyophis

CLASSIFICATION:

- Phylum : Chordata
- Class : Amphibia
- Order : Apoda
- Genus : Ichthyophis



Comments

- 1. Ichthyophis is a burrowing, elongated and eel-like.
- 2. Body colour is dark brown or bluish black with yellow band along the side.
- 3. Skin is provided with numerous transverse grooves or wrinkles.
- 4. Minute scales are embedded in the grooves of skin.
- 5. Limbs and limb girdles are entirely absent. Tail is short and vestigial.
- 6. Eyes are minute devoid of lids buried deep in the head.
- 7. A protrusible tentacle present between the nostril and eye. It is a sensory organ.
- 8. Tympanica membrane is absent.
- 9. Parental care is well developed. Female coils herself around the gelatinous egg mass to protect it from ground burrowing animals.

Characters of Reptilies

- These are creeping and burrowing terrestrial animals with scales on their body.
- They are cold-blooded animals found in most of the warmer regions of the world.
- Their skin is dry, and rough, without any glands.
- The body is divided into head, neck, trunk, and tail.
- Few of these shed the scales on their skin as skin cast.
- The respiration takes place with the help of the lungs.
- The skull is monocondylic.

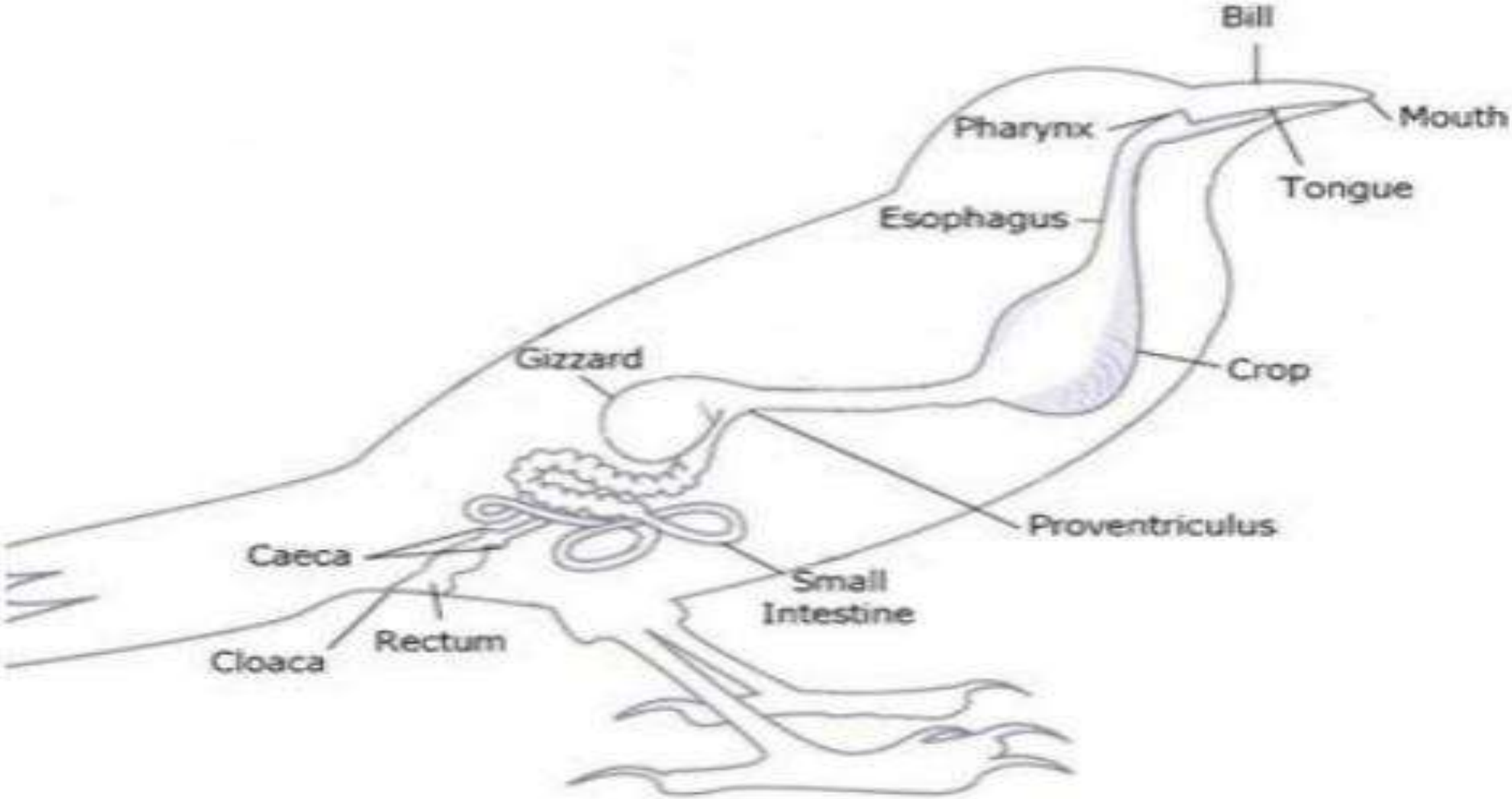
- They have two pairs of pentadactyl limbs, each bearing claws. Snakes are an exception.
- The heart is 3 chambered. However, crocodiles have a 4-chambered heart.
- The nervous system comprises of 12 pairs of cranial nerves.The lateral line system is absent in reptiles.
- Except for snakes, all the reptiles have well-developed ears.They possess a typical cloaca
- Reptiles are ureotelic, uricotelic, and ammonotelic.
- Fertilization is internal.
- They exhibit a meroblastic segmentation.
- They are oviparous and the eggs are very yolky. Eg., Snakes, Turtles, Lizards, Crocodiles

Characters of Aves

- Aves are Homeotherms (warm-blooded)
- • Bipedal feathered animals.
- • The fore-limbs developed into wings to fly
- •Hind limbs are adapted according to habit and habitat for walking, perching, grasping, wading and swimming.
- • Epidermal scales present on legs.

- The endoskeleton is bony with long hollow bones filled with air cavities. Known as pneumatic bones.
- Feathers help to prevent heat loss and provide passage for air.
- • There is no skin gland ,the uropygium gland or oil gland. This gland is present near the tail.
- The jaws are modified into a beak. They have no teeth. Beaks are delveloped according to feeding habit.
- Birds have highly developed sight, They have pecten in eyes and visible ear openings.
- • Their ears are divided into three parts –internal, middle, and external.

- Lungs are primary respiratory organ in birds spongy. Lungs have air sacs to supplement respiration
- Alimentary canal is complete. The crops help in softening food, and the gizzard helps in crushing the food.
- Metanephric that help to filter the nitrogenous fluid waste via the ureters, into the cloaca and renal system lacks a urinary bladder.•
- Birds have a single ovary and oviduct on the left side
- Oviparous : The eggs have four embryonic membranes- amnion, chorion, allantois, and yolk sac.


Bill
Mouth
Pharynx
Tongue
Esophagus
Crop
Gizzard
Proventriculus
Caeca
Small
Intestine
Rectum
Cloaca

Character of Mammals

Warm-blooded: Mammals can generate and maintain their own body temperature.

. Hair or fur: Mammals have hair or fur made of keratin that insulates their bodies.

Milk production: Mammals produce milk to feed their young.

Three middle ear bones: Mammals have three bones in their middle ear: the malleus, incus, and stapes.

Four-chambered heart: Mammals have a four-chambered heart with a left and right auricle and ventricle.

Diaphragm: Mammals have a diaphragm that separates their lungs and heart from their abdomen.

External ear opening: Mammals have an external ear opening and pinna.
Movable eyelids: Mammals have movable eyelids.
Body parts: Mammals have a head, neck, trunk, and tail.
Limbs: Mammals have four limbs with five digits each.
Examples of mammals include humans, cats, dogs, rats, deer, monkeys, apes, bats, whales, and dolphins.

Reproduction system

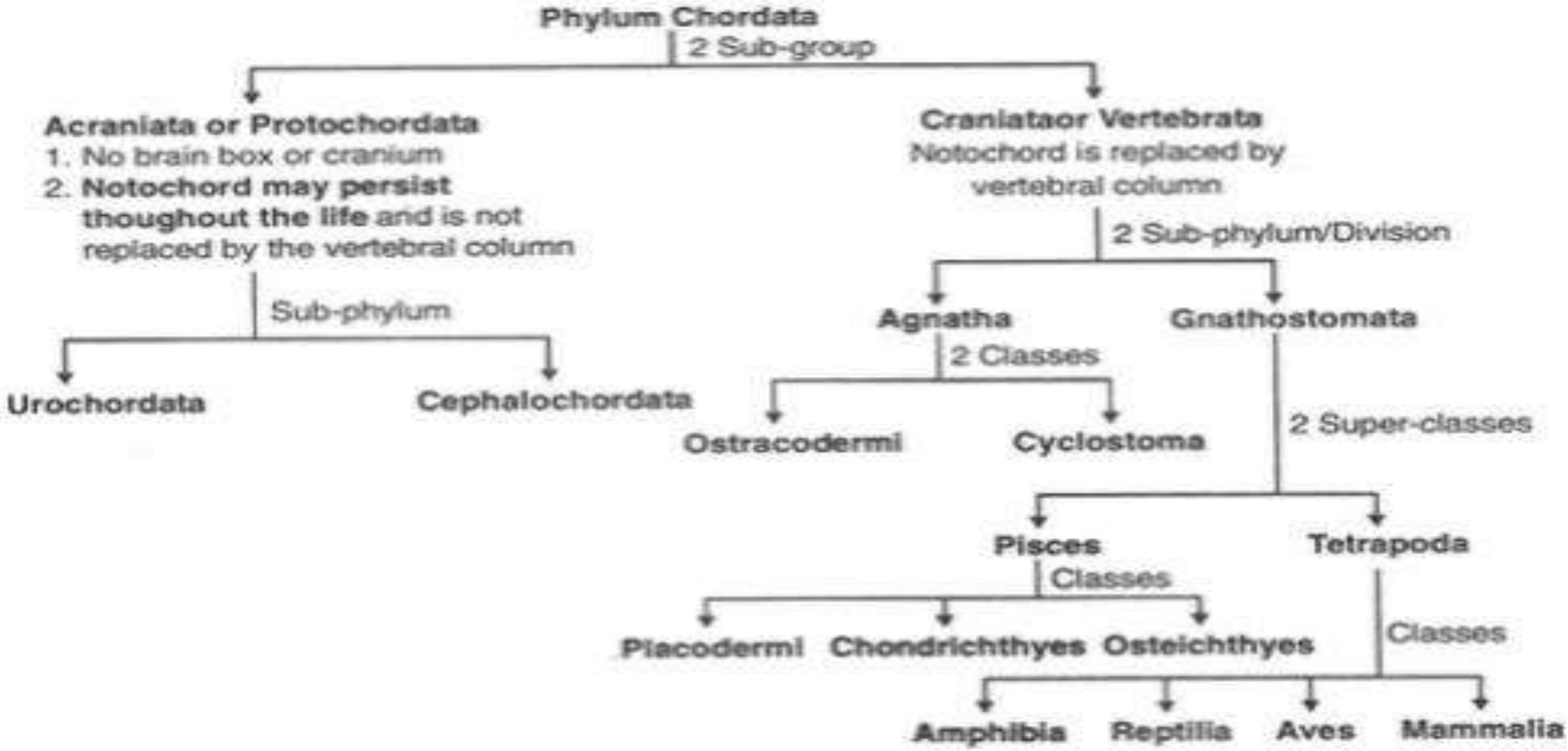
- There are three ways mammals reproduce. These are the placental mammals, marsupials and monotremes. The placental mammals give birth to live young. Placental mammals use the mother’s blood supply to feed the infants during the long gestation.

Economic importance of vertebrates

- Vertebrates are economically important because they are used for food, clothing, transportation, and more. They are also important for recreational activities like hunting.
- Food:
- Meat: Vertebrates like mammals and fish are a source of meat
- Milk: Mammals are a source of milk.
- Clothing:
- Wool: Mammals are a source of wool.

- Transportation :
- Farm work: Vertebrates can be used to help with farm work
- Transportation: Mammals can be used for transportation
- Recreational activities :
- Hunting: Vertebrates are often hunted as game animals.
- Fisheries :
- Commercial fishing: Vertebrates are important for commercial fishing

Classification of Chordata



Characters of chordates

- 1. PRESENCE OF NOTOCHORD: It is an elastic, longitudinal stiff rod present between the nerve cord and alimentary canal. It is covered by an outer chodal sheath and inner elastic sheath or elastic-internal. Below it vacuolated, nonnucleated cells are present. Notochord is present in the embryos of the vertebrates, but is replaced by vertebral column. In less-developed vertebrates the notochord is present throughout the life.
- 2.PRESENCE OF DORSAL TUBULAR NERVE CORD: The nerve cord in chordates is a hollow tube, situated dorsal to the alimentary canal and the notochord. It develops from the ectoderm. The cavity of nerve cord is called neurocoel.