# 6. ANIMAL KINGDOM

Animals are multicellular heterotrophs (depend on other plants' or, animals for food) Animal groups were several Nematodes infect, plant roots, where as sensory and nervous systems. others live on parasites in animals. Vast quan-tities of

Like plant life, early Animal life arose in the sea. Animals living in the sea are Marine Acquatic animals, They may live on the sea floor as BENTHIC forms Eg: Corals, PELAGIC forms (Swimming) Eg: Fishes and Plankto'nic forms (Floating)

Kingdom animalia shows enormous diversity. The two major groups of animals are non-chordates and the chordates. It is based on absence or presence of Notochord (Stiff flexible rod of tissue along the mid dorsal line of the body. It is changed to vertebral column in higher animals).

#### PORIFERA

Sponges are the most primitive group. Most of them are marine, attached to rocks. Adults are sessile with the cell-aggregate body plan. There are numerous pores on their body surface con-nected by way of canals to a central hollow chamber.

Sponge is a republic, of cells which identify one another, aggregate and grow together. Eg: SYCON

#### CPIIDAKIA (OLD NAME IS COELENTERATA)

These are mainly marine. Cnidariaris exhibit a blind sac body plan and are radially symmetrical. They are more advanced than sponges in having true tissues. The body wall consists of two cell layers (Diploblastic)-outer ectoderm inner endo- derm, separated by jelly like mesoglea.

Fentacles are present round the mouth inorder to capture the prey. Tentacles contain nematocysts. They are usually tfigerred by contact, and inject poision and paralyse the prey. They are unique to cnidarians.

Living corals are developed over dead coral below, giving rise to coral reefs. Coral reefs form .stable marine ecosystems. Eg:,Physalia (Portu-guese man of war), Hydra, Corals.

#### PLATYHELMIrtTHES (FLAT WORM)

The platyhelminthes are mostly parasites (Ani-mals living on other animals). Here the body wall consists of 3 layers (Triploblastic) outer ectoderm, inner endoderm and middle mesoderm.

These animals have specialised cells called TLAMf CELLS" for excretion and Osmoregula-tion. Parasitic tape worms contain no digestive sac of their own bbcauso they absorb nutrients through' their body wait.

**Eg:** Tape Worm (Taenia Solium) present in human intestine.

Fasciola Hepatlca. present in liver of sheep. NEMATHELMINTHES (Round Worm or Nematodes) others live on parasites in animals. Vast quan-tities of microscopic free-living nematodes thrive in soil rich in organic matter.

The hook worm, filarial'worm, guinea worm, are notorious nematode parasites in man which are spread through insanitary conditions.

### ANNELIDA

Annelidans are segmented animals with a trui coelome (upto nematodes there is false coelome or pseudo coelome) (coelome = Fluid filled body cavity between body wall and "the digestive tract)

Annelids have more complex digestive system than the Nematodes. It consists of muscular pharynx, a stomach, (where food is churned and digested) a long intestine'(to absorb digested food material) and anus (to expel out undigested waste material).

A closed circulatory system of blood vessels, a heart to move the blood is found forjhe first.time in Annelids in the evolution of animals.

Oxygenation of blood (Respiration) occurs through the moist skin. The excretory organs are paired Nephridia in each segment.'

**Eg:** Earth worm (Farmers friend). Blood Sucking Leech.

# ARTHROPODS

Arthropods constitute tHe largest group of animals. It includes scorpions, spiders, crabs,-prawns, and all insects. The success of Arthropods is to a large extent due to their unique chitinous cuticle, [cuticle covers body surface]

The cuticle originally developed .in marine arthro-pods as a protection against predators (one who depends on other ). Being impervious to water, it protects the body from drying.

Insects are able to fly because of chitinous wings. Arthropods have a segmented body covered by a jointed exoskeleton.

# SENSORY STRUCTURES IN ARTHROPODS ARE: CHORDATES

- (a) Antennae for perceiving odpur,
- (b) Eyes,
- (c) Statocysts for balancing,
- (d) Receptors for taste located in the feet of Insect.

insects communicate with chemicals, called 'PHEROMONES'. Some pheromones are sex attractants.

The Arthropodah eyes are simple or compound. The compound eyes are made of several identical units called OMMATEDIA, each with a lens. So, several separate



Add. 41-42A, Ashok Park Main, New Rohtak Road, New Delhi-110035 +91-9350679141 images are formed. This ena-bles the detection of even the slightest movement in the object being seen.'

Most of the Arthropods are egg laying animals (oviparous), some like scorpion, are viviparous (giving birth to young ones)

In most of the Arthropods, Trachea are respiratory organs and malpighian tubules are for excretion.

#### **MOLLUSCA** (Moluscus = soft bodied)

It is the 2nd largest animal phylum after arthro-pods. Most Molluscans have a protective hard shell. The body has. a soft muscular loot' on the ventral side. On the dorsal side of the foot is 'viseeral hump' which is covered, by MANTLE. This mantle secretes shell.

The inner calcareous surface of the several bivalve shells (two hinged shells) is iridescent and pearl like in appearance. Natural pearl formation is induced by factors like foreign substance, parasites or injuries. At the site of irritation shell secreting mantle cells begins secreting the shell material. The pearl grows in size as more layers are secreted over its surface. Eg: Snail, Oysters.

#### **ECHINODEKMS**

This phylum consists of only marine animals such as Starfishes, Brittle Stars, Sea Urchins, Sea Cucumbers, Sand dollars and Sea lilies.

The spiny skin of the echinoderm contains cal-careous plates. The starfish has 5 arms radiating from the centre. They have mouth on the lower side and anus on the upper side. Their most distinctive feature is the water vascular system. It consists of radiating canals and tube feet. Tubefeet main {unction is locomotion and capture of food.

The main features of Cfiordates are:

- (a) presence, of Notochord
- (b) presence of dorsal hollow nerve cord <
- (c) presence of paired gill slits.

In the Vertebrates the Notochod is present in ombryonic stage and it is transformed into vetebraf column or backbone.; The; gill slits remain'func-tional only in fishes, in higher animals, the embryonic gill slits disappear due to the development of 'lungs'.

Besides these 3 characteristics vertebrates pos-sess. ventral heart and 2 pairs of lateral appendages, either fins or limbs.

Living vertebrates are grouped into 5 classes. **PISCES (Fishes)** 

All living members of jaw-less vertebrates are parasites<sup>1</sup> on some fishes.v. These fishes attach themselves to some fishes and suck blood from them. Eg: Lamprays

Ail Cartilaginous fishes are marine. They have no bones but only cartilage, these fishes have 5 pairs of gilt slits which are not covered by gill cover. Eg: Sharks, Sting rays, Electric rays..

The bony fishes have a spindle shaped-body with Head, Trunk and Tail, gills are covered by gill covers.

Gills are the respiratory organs. Heart is two chambered with one auricle and one ventricle.

Tail fin helps to propel the fish, lateral fins are the balancers. The swim bladder (present above the alimentary canal) acts as buoyancy regulator. The "lateral line" sense organs on each, Side of the body are useful to detect the vibrations. There is no sound perception in fish.

**Note :** Sharks are viviparous (giving birth to young, ones)

#### AMPHIBIANS (Dual Life)

Most amphibians have two phases in their lives. In the larval stages they are fish like; adults live on land with their 4 limbs.

- (a) Adult amphibians are tetrapods with 4 limbs:
- (b) Their hind limbs are long and powerful and are used for jumping and swimming.
- (c) Skin is kept moist.
- (d) tongue is attached in front of the mouth.
- (e) Frogs and toads are noisy during the breeding season, each species communicating with its distinctive vocal signals.
- (f) Heart is 3 chambered.

#### REPTILES

(Reptile = Creeping animal) Eg: Lizards, Snakes, Turtles, tortoises, crocodiles, etc.,

200 million years ago, gigantic reptiles (Dino-saurs) roamed the earth. But they became extinct due to climatical variations. Present day reptiles are readily distinguished by their dry, horny, scale covered skin.. Respiration is only through lungs. The heart is 3 chambered, but single ventricle is improved by a septum which partially separates the ventricle. The only exception is crocodile which possesses chambered heart as. in birds and mammals.

#### Reptiles are truly land animals. This can be made sure by the following features:

- (a) Development of internal fertilisation.
- (b) Presence of a special membrane in the yolk filled egg called "AMNION". The Amnion encloses the embryo and provides it with a watery environment during development.

#### AVES (Birds)

Birds characteristic feature is presence of feathers and power of flight. The entire body is streamlined and covered by feathers. The forelimbs were modified into wings. They are powered by flight muscles.

The bones of the skeleton are hollow and con-nected by air passages. This reduces the, weight of the body. The lungs also have air sacs inorder to have double respiration or continuous respira-tion.

Heart is four chambered. - two auricles & two ventricles. This allows complete separation of the oxygenated blood from the de-oxygenated blood. Birds



Add. 41-42A, Ashok Park Main, New Rohtak Road, New Delhi-110035 +91-9350679141 have a keen sense of sight. Eyes posses 'PECTEN' in order to have a better view.

# MAMMALIA (milk -sucking mammals)

The unique characteristic feature in mammals is milk producing "Mammary Glands" by which the young are nourished.

Other features are, pesence of hair, and sweat glands. - They have constant body temperature (birds also), and high rate of metabolism.

Heart is 4 chambered/lungs are well developed and Breathing is enhanced by the 'diaphram'

Eg: Kangaroo (common in Australia), man,. bat, mole.

The mammals, are classified into 3 groups

- a) Egg-laying mammals
- b) Pouched mammals like Kangaroo

c) True placental mammals which nourish their young in the wombs through the placenta:

**PLACENTA :** It is a special structure connecting foetus in the womb and the uterus of the mother.

Whales and dolphins are acquatic mammals with forelimbs modified as flippers. They lack hind limbs.

The distinctive feature of man is the grasping limb with opposable thumb.

# NOTE:

Pisces, amphibians and reptiles are Poikilothermous or cold blooded animals (body temperature according to the environmental temperature) but Birds and Mammals are warm-blooded animals or Homiotherms (body temperature is kept con-stant). **NOTE:** 

Reptiles, aves and mammals are called Arimiotes because they possess Amnion Rest of the chor- dates are called Anamniotes (lack Amnion).



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