

CHAPTER 7

DIVERSITY IN LIVING ORAGNISM

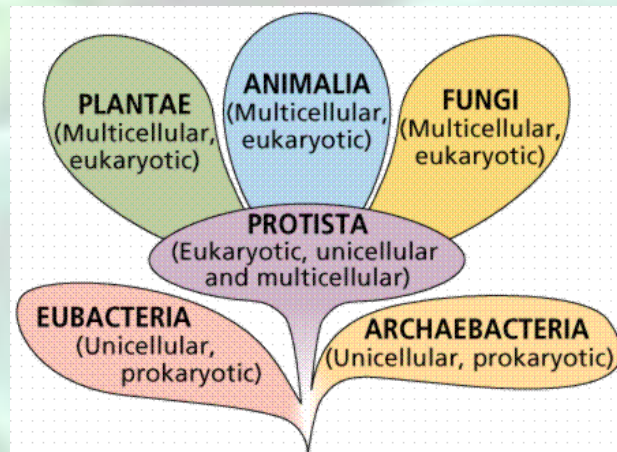


Chapter 7: “Diversity in Living Organisms”

KEY CONCEPTS : [*rating as per the significance of concept]

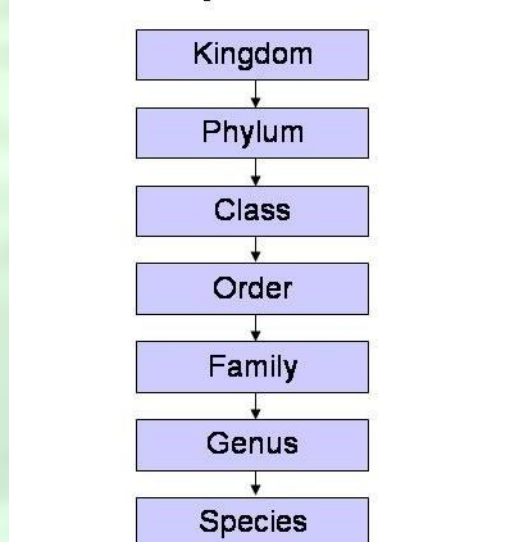
CONCEPTS	RATING
Basis of classification	***
Hierarchy of classification	****
Kingdom Plantae	*****
Kingdom Animalia	*****

1. Each **organism** is different from all other organisms.
2. In this activity, we decide which **characteristics** (we can run, but the Banyan tree can't run is a characteristic) are important in forming the desired **category**.
3. **Greek thinker Aristotle classified animals according to whether they lived on land, in water or in air.** This classification is a landmark in ideology, but has limitations. For example, animals that live in the sea include Corals, Whales, Octopus, Starfish, and Shark. In fact they are different from each other.
4. **Classification and Evolution:** organisms are classified based on body design, hierarchy in developing, relation to evolution. **Charles Darwin** first described the idea of evolution in 1859 in his book “ **The Origin of Species**”
5. The Biologists, such as Haeckel, Whittaker & Carl Woese tried to classify all living organisms into broad Kingdoms. **The Whittaker proposed five kingdoms: Monera, Protista, Fungi, Plantae and Animalia.** Carl Woese introduced by dividing Monera into **Archaeobacteria and Eubacteria.**



6. Hierarchy of Classification :

Linnaeus's System of Classification



- Monera:** They have **unicellular, Prokaryotic organisms** (do not have defined nucleus or organelles). The cell wall may or may not be present. The mode of nutrition is **autotrophic** (synthesizing food on their own) **(or) heterotrophic** (getting food from environment). **Ex. Bacteria, Anabaena.** (Please refer to Fig. 7.1 Monera NCERT Book Page-83)
- Protista:** They have **unicellular eukaryotic organisms** (do have well defined nucleus or organelles). The body is covered by **cilia, flagella for locomotion**. The mode of nutrition is **autotrophic or heterotrophic**. **Ex. Diatoms, protozoans.** (Please refer to Fig. 7.2 NCERT Book Page-84)

9. **Fungi:** These are multi-cellular **eukaryotic organisms with cell wall, made up of Chitin**. They do not perform Photosynthesis (**heterotrophic**), **Saprophytic** (derive nutrition from decaying material). Ex. Aspergillus, Penicillium, Mushroom, Rhizopus. The fungi living with algae forms **Lichen (Symbiotic Association)** .(Please refer to Fig. 7.3 NCERT Book Page-84).
10. **Plantae:** These are multi-cellular eukaryotic organisms with cell wall, made up of Cellulose. Able to perform photosynthesis (**autotrophic**). Ex. Rice, wheat.
11. **Animalia:** These are multi-cellular eukaryotic organisms without cell wall. They are not able to perform photosynthesis (**heterotrophic**). Ex Human beings, Peacock.
- (Please refer to Fig. 7.4 NCERT Book Page-85).

DETAILS OF KINGDOM PLANTAE

1. The kingdom Plantae is further classified as Thallophyta, Bryophyta, Pteridophyta, Gymnosperms, Angiosperms .

2. **Thallophyta:** The plants do not have well defined body design, commonly called as "Algae", mostly aquatic. Ex. Spirogyra, Ulothrix. (Please refer to Fig. 7.5 NCERT Book Page-86).

3. **Bryophyta:** These are commonly called as the "Amphibians of Kingdom". The plant body is differentiated into **roots like, stem like and leaf like structures**. No specialized tissues for the conduction of water and food. Ex. Marchantia, Funaria. (Please refer to Fig. 7.6 NCERT Book Page-86).

4. **Pteridophyta:** These are commonly called as the "First vascular land plants ". The plant body is differentiated into root, stem and leaf. Specialized tissues for the conduction of water and food are developed in these plants. The reproductive organs are inconspicuous. Ex. Marsilea, Fern. (Please refer to Fig. 7.7 NCERT Book Page-87).

Special Note: The reproductive organs are inconspicuous in Thallophyta, Bryophyta, Pteridophyta are can't develop seeds. They are together called as " **Cryptogamae (Non-Flowering Plants)**". The plants with well differentiated reproductive organs and that

ultimately **make seeds** are called "**Phanerogams (Flowering Plants)**". This group is further classified **Gymnosperms (Bear naked Seeds) & Angiosperms (Bears seeds inside Fruit)**.

5. Gymnosperms: These are commonly called as "**Naked seed bearing plants**". They are usually perennial, evergreen and woody. Ex. Pinus, Cycas (Please refer to Fig. 7.8 NCERT Book Page-87).

6. Angiosperms: These are commonly called as "**Enclosed seed bearing plants**". Plants with seeds having a single cotyledon are called as "**Monocotyledons or Monocots**". Plants with seeds having two cotyledons are called as "**Dicots**". Ex. Ipomoea, Paphiopedium. (Please refer to Fig 7.9 & 7.10 NCERT Book Page-87 ; Fig. 7.11 Page-88).

DETAILS OF KINGDOM ANIMALIA

These are Eukaryote, multicellular and hetero-trophic.

They are further classified as **Non- Chordates** (Porifera, Coelenterata, Platyhelminthes , Nematoda, Annelida, Arthropoda, Mollusca, Echinodermata) and **Chordates** { Protochordata, Vertebrata (Pisces, Amphibians, Reptilia, Aves, Mammalia) }.

I. Non- Chordates

1. Porifera: The word Porifera " means organisms with holes". The **canal system** helps in circulating water, food, oxygen. They are non-motile with cellular level of organization and mainly **marine** organisms with hard outer coat called as **Skeleton**. They are commonly called as **Sponges**. Ex. Spongilla, Sycon (Please refer Fig. 7.12, NCERT Text Book Page- 89)

2. Coelenterata: The word Coelenterata " means organisms with body cavity called Coelenteron" . They are radially symmetrical, **Diploblastic** (two layers of cells), commonly called as **Cnidarians** (Stinging cells for protection are present in the body). Ex. Hydra, Sea Anemone (Please refer Fig. 7.13, NCERT Text Book Page- 89).

3. Platyhelminthes: The word **Platyhelminthes** means organisms with flatworms (**dorsocentrally flattened**)". They are bilaterally symmetrical **Triploblastic** (three layers of

cells), **either free-living or parasitic. No true Coelom is present - Acoelomates.** Ex. Planaria(Free living) , Tape worm(Parasitic)(**Please refer Fig. 7.14, NCERT Text Book Page- 90).**

4. Nematoda: The word **Nematoda** “means **organisms with roundworms**”. They are bilaterally symmetrical **Triploblastic** (three layers of cells), **familiar with parasitic worms.** The **false Coelom is called as Pseudocoelome.** Ex. **Ascaris, Wuchereria (Filarial worm causes elephantiasis).**(**Please refer Fig. 7.15, NCERT Text Book Page- 90).**

5. Annelida: The word **Annelida** “ means **organisms with metameric-segmented**”. They are bilaterally symmetrical Triploblastic(three layers of cells) with closed circulatory system, **familiar with earth worms.** The **Coelom is called as true Coelom.** Ex. **Neris, Earth worm, Leech (Please refer Fig. 7.16, NCERT Text Book Page- 90).**

6. Arthropoda: The word **Arthropoda** “means **organisms with jointed legs**” They are bilaterally symmetrical Triploblastic(three layers of cells), **familiar with cockroaches.** The **Coelom is blood filled called as Haemo Coelom.** Ex. **Prawn, Scorpion, Housefly (Please refer Fig. 7.17, NCERT Text Book Page- 91).**

7. Mollusca: The word **Mollusca** “means **organisms with soft body**” They are bilaterally symmetrical, Triploblastic(three layers of cells), **familiar with Octopus, Pila.** Foot is for moving, kidney like organ for excretion, with open circulatory system. Ex. **Unio, chiton(Please refer Fig. 7.18, NCERT Text Book Page- 91).**

8. Echinodermata: The word **Echinodermata** “means **organisms with spiny skinned**”. **Exoskeleton is with calcium carbonate.** They are radially symmetrical **Triploblastic** (three layers of cells) with coelomic cavity, **familiar with Star fish.** They are **exclusively free-living marine animals.** Ex. **Sea Cucumber, Feather Star (Please refer Fig. 7.19, NCERT Text Book Page- 91).**

II. Chordates: They are further classified as two major groups such as **Protochordata & Vertebrata**

(A). Protochordata: **Notochord present in at least larval forms, but very rudimentary.** It is a rod like supporting structure, runs along with nervous tissue from the gut of animal. They

are bilaterally symmetrical, triploblastic (three layers of cells) with a Coelom, **familiar with Amphioxus**. Ex. **Balanoglossus** (Please refer Fig. 7.20, NCERT Text Book Page- 92).

(B).Vertebrata: Notochord is replaced by vertebral column and internal skeleton. They are bilaterally symmetrical, triploblastic, coelomic and segmented having paired gill pouches. Vertebrates are grouped into five classes.

1. Pisces: These are commonly called as “fishes”, exclusively aquatic. Body is streamlined and a tail for locomotion. Gills for respiration, heart is two chambered, cold blooded, skin is covered with scales, plates. They are cold-blooded animals. Skeleton of bone (Rohu) / cartilage(Shark). They lay eggs. Ex. Lion Fish, Dog Fish (Please refer Fig. 7.21, NCERT Text Book Page- 92).

2. Amphibians: These are commonly called as “Amphibians” because they can live on land and in water”. Body is streamlined and a webbed foot/ foot for locomotion. Gills or lungs or skin for respiration, heart is three chambered, cold blooded, skin is lack of scales, plates. They are cold-blooded animals. They lay eggs. Ex. Rana, Hyla (Please refer Fig. 7.22, NCERT Text Book Page- 93).

3. Reptilia: These are commonly called as “Reptilians”. A lung for respiration, heart is three chambered (Crocodile heart is four chambered), skin have scales. They are cold-blooded animals. They lay eggs. Ex. Snakes, Turtles (Please refer Fig. 7.23, NCERT Text Book Page- 93).

4. Aves :These are commonly called as “Birds”. A lung for respiration, heart is four chambered, fore limbs are modified for flight, skin has feathers. They are warm-blooded animals. They lay eggs. Ex. Ostrich (Flightless Bird), Pigeon, Sparrow (Please refer Fig. 7.24, NCERT Text Book Page- 94).

5. Mammalia: These are commonly called as “animals with mammary glands for producing milk to nourish their young ones”. A lung for respiration, heart is four chambered, skin has hairs, sweat or oil glands. They are warm-blooded animals. They lay eggs (Platypus, Echidna), give birth to young ones poorly developed (Kangaroo) & give birth to developed

young ones (Human beings). Ex. Lion, Whale, Bat (*Please refer Fig. 7.25, NCERT Text Book Page- 94& Fig.7.26, classification of Animals, Page- 95*).

DETAILS OF NOMENCLATURE

NOMENCLATURE: The system of **scientific naming or nomenclature** was **introduced by Carolus Linnaeus**. It is **unique to identify in the world**. We limit ourselves to writing the **names of the Genus and Species** of that particular organism. The world over, it has been agreed that both these names will be used in **Latin forms**. When **printed** is given in **italics** and when **written by hand**, the Genus and Species name have to be **underlined separately**.
Ex. Ostrich (Common name): ***Struthiocamelus***(scientific name with two parts namely the Genus and Species).

QUESTION BANK

1. What is the book written by Charles Darwin? (The Origin of Species)
2. Who proposed the five kingdoms such as, Monera, Protista, Fungi, Plantae and Animalia? (Whittaker)
3. Monera members are unicellular, Prokaryotic organisms, mention TRUE/ FALSE (TRUE)
4. The Diatoms belongs to the kingdom (Protista)
5. The Anabaena belongs to the kingdom..... (Monera)
- 6.....are commonly called as the“Amphibians of Plant Kingdom”.(Bryophyta)
7. The warm-blooded animals with fore limbs modified for flight, skin has feathers are called as... (Aves/Birds)
8. Write the four salient features of Reptiles.
9. Compare the Pisces and Amphibians.

10..Write the five salient features of Mammalia, give two examples.

QUESTION PAPER:FORMATIVE ASSESSMENT – I (For Practice)

Marks- 40

Time: 90 minutes

* General Instructions

1. Questions 1-5 (1 Mark each)
2. Questions 6-10 (2 Mark each)
3. Questions 11-15 (3Mark each)
4. . Questions 16-17 (5Mark each)

Q.1 Anabaena is member of the Phylum.....

Q.2 Aspergillum is a member of the Phylum.....

Q.3 Define the term Autotrophic mode of nutrition.....

Q.4 The fungus living with algae is called as

Q.5 Name the scientist who has divided the Monera into two sub-groups.....

Q.6 Draw and label Paramecium.

Q.7 Distinguish the meaning of terms Gymnosperms and Angiosperms.

Q.8 What is Pseudocoelome? Give one example of it.

Q.9 What is Haemocoelome? Give one example of it.

Q.10 Write two salient features of mammalian group.

Q.11 What is the basis of nomenclature of organisms, give the scientific name of Ostrich.

Q.12 Give three salient features of Amphibia.

Q.13 Mention three features of Chordates.

Q.14. Draw and label Balanoglossus.

Q.15 Give two salient features of Aves and mention one example of a flightless bird.

Q.16 Write about the Hierarchy of Classification- Groups and mention basic unit of classification.

Q.17 Give the salient features of Bryophytes and draw the diagram of Funaria.

.....X.....