

# Chapter 7: Five Kingdom Classification

## Introduction:

The Five Kingdom Classification system, proposed by **R.H. Whittaker** in 1969, classifies all living organisms into five kingdoms based on their cell structure, mode of nutrition, body organization, and reproduction.

---

## 1. Kingdom Monera:

- **Characteristics:**
    - Unicellular, prokaryotic organisms.
    - Lack a true nucleus and membrane-bound organelles.
    - Cell wall present (peptidoglycan in bacteria).
    - Autotrophic (photosynthetic/chemosynthetic) or heterotrophic.
  - **Examples:** Bacteria, Cyanobacteria (Blue-green algae).
- 

## 2. Kingdom Protista:

- **Characteristics:**
    - Unicellular, eukaryotic organisms.
    - Possess a well-defined nucleus and organelles.
    - Can be autotrophic (algae) or heterotrophic (protozoa).
    - Movement through cilia, flagella, or pseudopodia.
  - **Examples:** Amoeba, Paramecium, Euglena.
- 

## 3. Kingdom Fungi:

- **Characteristics:**
    - Multicellular (except yeast), eukaryotic.
    - Cell wall made of chitin.
    - Heterotrophic (saprophytic or parasitic).
    - Reproduce via spores.
  - **Examples:** Mushroom (Agaricus), Yeast (Saccharomyces), Molds (Rhizopus).
-

## 4. Kingdom Plantae:

- **Characteristics:**
  - Multicellular, eukaryotic.
  - Cell wall made of cellulose.
  - Autotrophic (photosynthetic).
  - Exhibit alternation of generations.

### Major Divisions of Plantae:

1. **Thallophyta (Algae):**
  - Simple, aquatic plants without true roots, stems, or leaves.
  - Example: Spirogyra, Chlamydomonas.
2. **Bryophyta (Mosses and Liverworts):**
  - Non-vascular, simple root-like structures (rhizoids).
  - Moist, shady habitats.
  - Example: Funaria (Moss), Marchantia (Liverwort).
3. **Pteridophyta (Ferns):**
  - Vascular, with roots, stems, and leaves.
  - Reproduce via spores.
  - Example: Fern (Pteris), Selaginella.
4. **Spermatophyta (Seed Plants):**
  - Seed-bearing, vascular plants.
  - Subdivided into:
    - **Gymnosperms:** Naked seeds (e.g., Pine, Cycas).
    - **Angiosperms:** Seeds enclosed within fruits (e.g., Mango, Rose).

---

## 5. Kingdom Animalia:

- **Characteristics:**
  - Multicellular, eukaryotic.
  - No cell wall, heterotrophic.
  - Capable of movement (at some life stage).

### Non-Chordates (Invertebrates):

1. **Porifera (Sponges):**
  - Pore-bearing, aquatic.
  - Example: Sycon, Spongilla.
2. **Coelenterata (Cnidaria):**
  - Aquatic, radial symmetry.
  - Stinging cells (cnidocytes).
  - Example: Hydra, Jellyfish.

3. **Platyhelminthes (Flatworms):**
  - Bilateral symmetry, flattened body.
  - Parasitic or free-living.
  - Example: Planaria, Tapeworm.
4. **Nematoda (Roundworms):**
  - Cylindrical, unsegmented body.
  - Parasitic or free-living.
  - Example: Ascaris, Wuchereria.
5. **Annelida (Segmented Worms):**
  - Segmented body, bilateral symmetry.
  - Example: Earthworm, Leech.
6. **Arthropoda (Jointed Legs):**
  - Exoskeleton made of chitin.
  - Largest phylum.
  - Example: Insects (Butterfly), Crustaceans (Crab).
7. **Mollusca:**
  - Soft-bodied, usually with a shell.
  - Example: Snail, Octopus.
8. **Echinodermata:**
  - Spiny-skinned, marine.
  - Radial symmetry (adult), bilateral (larva).
  - Example: Starfish, Sea Urchin.

---

## **Chordates (Vertebrates):**

- **Characteristics:**
  - Presence of notochord, dorsal nerve cord, and pharyngeal slits at some life stage.

### **Classes of Chordates:**

1. **Pisces (Fishes):**
  - Aquatic, gills for respiration.
  - Example: Rohu, Shark.
2. **Amphibia:**
  - Dual life (water and land), moist skin.
  - Example: Frog, Salamander.
3. **Reptilia:**
  - Scaly skin, cold-blooded.
  - Example: Snake, Lizard.
4. **Aves (Birds):**
  - Feathers, beak, warm-blooded.
  - Example: Sparrow, Eagle.
5. **Mammalia:**

- Mammary glands, warm-blooded, hair/fur.
  - Example: Human, Tiger.
- 

### **Conclusion:**

The five kingdom classification provides a systematic way to categorize the diversity of life. Each kingdom has distinct characteristics that help in identifying and studying various organisms. Understanding these classifications aids in comprehending the evolutionary relationships among different life forms.

