# THE LIVING WORLD

**Dr. SUNITA PANCHWAT**
Assistant Professor
Department of Pharmaceutical Sciences
MLSU, Udaipur

# Introduction

- World is full of living and non-living things. Various forms of living organisms are found in different types of habitats in the world like ocean, air, fresh water, forests, cold mountains, deserts, hot water, springs etc.
- Characteristics of living organisms are;

a. Living things have cellular organization
b. They undertake metabolism of food
c. Living organisms can grow
d. Living organisms response to stimuli (Irritability)
e. Living organisms give rise to next progeny (Generation).

## Characteristics of living organism

- Growth
- Reproduction
- Metabolism
- Cellular Organization
- Consciousness

# Diversity in the Living World

- It is known that more than 5 million living species exists on earth out of these approximately 1.5 million species are known.
- They are coming from all corners of all sources and to study all of them is nearly impossible.
- For convenience, depending upon their occurance and physical forms they are classified.
- Their diversified sources like deserts, oceans, forests and cold zones make their study very difficult.

# Binomial Nomenclature

- It is universally accepted that plants and animals around use are known various local names for convenience, it is also agreed that they should be known by titles uniform through out so that there is no confusion about their identity. Scientists have finalize the procedure to assign their names ICBN (International code for Botanical Nomenclature) and ICZN (International code for Zoological Nomenclature) were entrusted to name the plants and animals respectively.

- **Rules of Nomenclature:**

1. Each scientific name has two parts. The first word represents genus and the second represents the specific epithet.
2. The words of the name should be separately underlined when handwritten and should be in italics when printed.
3. The generic name should start with a capital letter and specific epithet should start with a small letter.
4. The names should be either Latin or Latinized.
5. Name of the author appears at the end of the scientific name and in an abbreviated form e.g. Saraca indica Linn. It indicates that this species is first described by **Linnaeus**.

# Classification

It is the arrangement of organisms in specific group or categories based on certain characters. These categories are called **taxa.**

**Taxonomy-** It is the science of identification, nomenclature and classification of organisms based on external and internal structure with cell structure, development process and ecological information.

**Systematics**- It is the study of organisms with reference to identification, nomenclature.

The descending order of taxa used in classification are- Kingdom, Phylum or Division, Class, Order, Family, Genus and Species.

This system was finalized by *Carolus Linnaeus* and is known as *Binomila* nomenclature. It is followed by all biologists of the world.

## species

- Group of individuals having fundamental similarities and successful reproduction takes place among themselves
- Distinct morphological difference is there between two closely related species
- **Eg: *Panthera tigris*, *Panthera leo*, *Solanum tuberosum*, *Solanum nigrum*.**
- *tigris*, *leo*, *tuberosam*, *nigrum*- Specific epithet/ species name
- *Panthera* & *Solanum*- generic name, next higher level taxon
- Genus may have more than one specific epithet- represent different organism



## genus

- **Genera are aggregates of closely related species.**
- Group of related species with more characters in common than species of other genera
- ***E.g: Panthera leo ,P. pardus (leopard) ,P tigris***
- Animals which comes under genus *Panthera* shares several common features & differs from genus *Felis*
- Potato (*Solanum tuberosam*) & Brinjal (*S. melongena*)

## family

- It has a group of related genera with less number of similarities
- Characterized on the basis of vegetative & reproductive feature
- E.g:family Solanaceae includes genera *Solanum*, *Petunia* & *Datura*.
- Family Felidae includes genera *Panthera* (lion, tiger ,leopard) & *Felis* (cat)

## Order

- Assemblage of families which exhibit few similar characters
- Similar characters will be less in number
- Plants family Convolvulaceae, Solanaceae- order **Polymoniales**
- Animals family Felidae & Canidae- order **Carnivora**

## class

- It includes all related orders having few similar characters. .
- E.g: class **Mammalia** includes order Primata (monkey, gorilla, gibbon) & Carnivora.
- Class Dicotyledonae includes order polymoniales & sapindales(mango)

## Phylum/ division

- It include classes with very few similarities
- Phylum **Chordata** includes classes fish, amphibia, reptilia, aves & mammalia due to common feature- presence of notochord & dorsal hollow neural system
- Division **Angiospermae** includes class dicotyledonae & monocotyledonae.

## kingdom

- Highest category of taxonomy
- Animals- Kingdom Animalia
- Plants- Kingdom Plantae

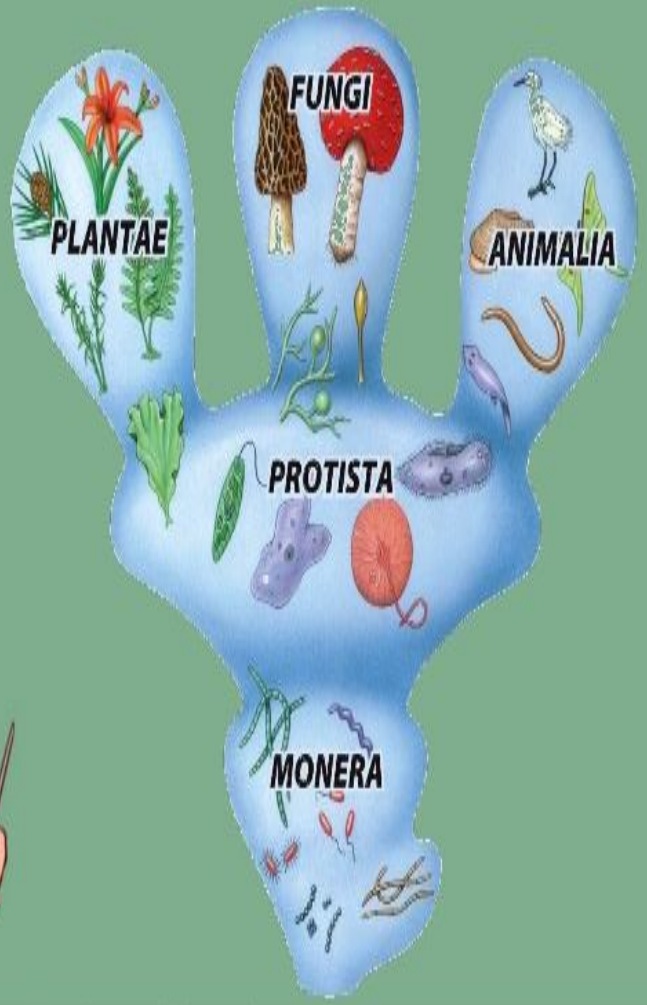
# Five Kingdom of Life

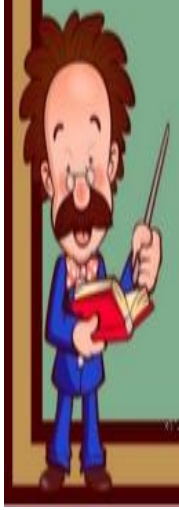
- 1967, Robert Whittaker introduced the five-kingdom classification system.



- In 1988, Margulis and Schwartz modified the five-kingdom classification of Whittaker.
- They considered genetics along with cellular organization and mode of nutrition in classification.

# Five Kingdoms



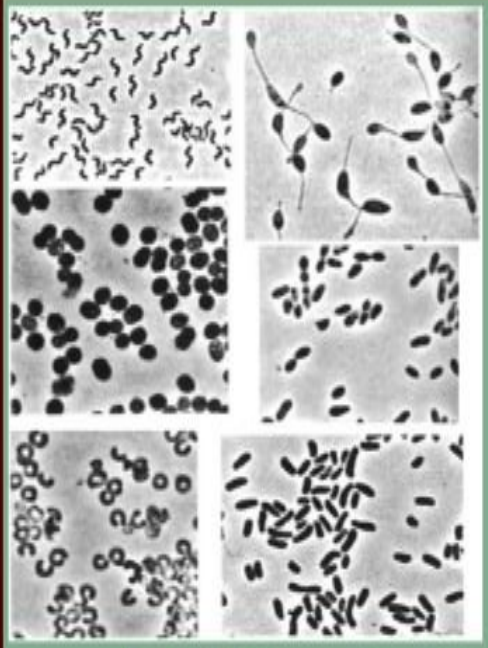


# Basis of Five Kindom System

- The levels of cellular organization:
  - > prokaryotic
  - > unicellular eukaryotic
  - > multicellular eukaryotic
- The principal modes of nutrition
  - > photosynthesis
  - > absorption
  - >ingestion

1. **Monera-** The monerans are the simplest form of the entire living organisms. They are extremely small. These organisms are prokaryotic. The organisms are simple unicellular and microscopic. The cell wall is present in some organisms and absent in others. Their cell wall is not made up of cellulose. They do not possess definite nucleus and lack cell organelles. Examples are Bacteria, mycoplasma, blue green algae etc.

2. **Protista-** A kingdom or large grouping that comprises mostly single celled organisms such as the protozoa, simple algae and fungi, slime moulds and bacteria. This group consists of many types of unicellular eukaryotic organisms. They have defined nucleus and membrane bound organelles.



# Kingdom Monera



# Kingdom protista

3. **Fungi-** Fungi are simple eukaryotic, lacking chlorophyll. Cell wall is present, made up of tough complex sugar called chitin. They are non-photosynthetic. Their mode of nutrition is heterotrophic. Most of them are saprophytes. Fungi are multicellular called mycelium composed of several thread like structures called **hyphae** (exceptionally yeast is unicellular fungus).

4. **Animalia-** This group consists of all multicellular eukaryotes which do not posses cell wall. These are heterotrophic they do not prepare their own food. They are multicellular eukaryotes. Cell wall is absent. They show very limited growth which stops after maturity. Kingdom animalia is further classified into Vertebrates and Invertebrates.

# KINGDOM ANIMALIA



# KINGDOM FUNGI

**5. Plantae-** This group consists of multicellular Eukaryotic organisms. They are autotrophic. They posses cell wall made up of cellulose.


THANK YOU