

# BIOL 157: PRINCIPLES OF SYSTEMATICS

## LESSON 9

.DESCRIPTION OF ORGANISMS  
UNDER DIFFERENT KINGDOMS  
.DIVERSITY OF ORGANISMS

# THERE ARE 5 KINGDOMS

- **1. Kingdom Monera**
- These are the Eubacteria and Archeobacteria.
- Individuals are single-celled, may or may not move, have a cell wall, have no chloroplasts or other organelles, and have no nucleus.
- Monera are usually very tiny, although one type, namely the blue-green bacteria, look like algae.

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- They are filamentous and quite long, green, but have no visible structure inside the cells.
- No visible feeding mechanism.
- They absorb nutrients through the cell wall or produce their own by photosynthesis.

## 2. Kingdom Protista / Protoctista

- Protists are single-celled organisms.
- They usually move by cilia, flagella, or by amoeboid mechanisms.
- There is usually no cell wall, although some forms may have a cell wall.
- They have organelles including a nucleus and may have chloroplasts, so some will be green and others won't be.

- They are small, although many are big enough to be recognized in a dissecting microscope or even with a magnifying glass.
- Nutrients are acquired by photosynthesis, ingestion of other organisms, or both.

### 3. Kingdom Fungi

- Fungi are multicellular, with a cell wall, organelles including a nucleus, but no chloroplasts.
- They have no mechanisms for locomotion. Fungi range in size from microscopic to very large ( such as mushrooms).
- Nutrients are acquired by absorption. For the most part, fungi acquire nutrients from decaying material.

## 4. Kingdom Plantae

- Plants are multi-cellular
- Most don't move, although gametes of some plants move using cilia or flagella.
- Organelles including nucleus, chloroplasts are present,
- Cell walls are present.
- Nutrients are acquired by photosynthesis (they all require sunlight).

## 5. Animalia

- Animals are multi-cellular,
- They move with the aid of cilia, flagella, or muscular organs based on contractile proteins.
- They have organelles including a nucleus,
- but no chloroplasts or cell walls.
- Animals acquire nutrients by ingestion.

## **A. KINGDOM MONERA**

- These are prokaryotes.
- Monera has **3 Phyla**; Autotrophs, fermenting heterotrophs, and respiring heterotrophs.
- and **16 Classes**.
  1. **Fermenting heterotrophs**; has 5 classes .
    - i) Wall deficient bacteria, ii) Spirochaetes
    - iii) fermenting bacteria, iv) methanogenic bacteria, v) sulphate-reducing bacteria

## 2. Autotrophs

These are 4 in number (Classes)

-Prochlorophyta

-Cyanobacteria

-Anaerobic photosynthetic bacteria

-Chemoautotrophic bacteria

- **3. Respiring Heterotrophs;**
- These are 7 in number.
- - Nitrogen fixing bacteria
- -Micrococci
- -Pseudomonads
- -Aeroendospora
- -Omnibacteria
- -Actinobacteria
- -Myxobacteria

## **B. KINGDOM PROTISTA**

- These are eukaryotes. Single celled and require water medium /habitat for living.

They are also referred to as Protoctista.

They have 11 phyla.

- i) Phylum Chrysophyta,
- ii) Phylum Phaeophyta
- iii) Phylum Dinoflagellata, iv) Phylum Rhodophyta,
- v) Phylum Bacillariophyta (Diatom),

- vi) Phylum Euglenophyta,
  - vii) Phylum Chlorophyta,
  - viii) Phylum Sarcodina,
  - ix) Phylum Ciliophora,
  - x) Phylum Teleospora
- xi) Phylum Rhizopoda

## **C. PHYLUM PLANTAE**

- Plantae has **2 Divisions**; Vascular and non-vascular
- 1. **Non-vascular** has no /developed vascular bundles and stems; ie. **Bryophyta**. Eg. Mosses, liverworts and hornworts .
- 2. **Vascular**; these have developed vascular systems. ie. **Tracheophyta**
- Tracheophytes have 2 types (Sub-Division);
- **Sub Divisions**; Non spermatophytina and spermatophytina.

- Sub-Division Non spermatophytes are the ferns (**Pterydophyta**). Have no flowers. Possess spores on back of leaves.
- Pterydophytes have **4 Classes**;
- Class Lycophytina,
  - Class Psilophytina,
  - Class Sphenophytina and
  - Class Filocophytina

- Sub-Divison Spermatoptina (flowering plants).
- There are 2 types (**Classes**);  
Gymnospermopsida and Angiopermopsida.  
These are seed bearing plants.
- **Class Gymnospermopsida**; has seeds exposed in fruits. Eg. Cycads, Conifers, etc.
- This has **4 Sub-Classes**; Cycadopsida, Gnetopsida, Coniferopsida and Ginkopsida.

- 2. Class Angiospermopsida; These have their seeds enclosed in fruits.
- Has **2 major sub-classes**; Monocotyledonidae and Dicotyledonidae.
- 1. Sub-Class **Monocotyledonidae** has one seed leaf in the seed. Eg. Grasses, maize, etc.
- 2. Sub-Class **Dicotyledonidae** has 2 seed-leaves /cotyledons in each seed. Eg. All plants that are not grass-like.

# KINGDOM FUNGI

- Organisms possess no chlorophyll nor do they move. They undergo extracellular digestion.
- Have hyphae forming mycelium. Spores. Moulds, etc.
- Has **5 major Phyla**; Phylum Zygomycota, Phylum Ascomycota, Phylum Deuteromycota, Phylum Basidiomycota, and Phylum Micophycophyta.

- Only 2 of the phyla has classes.
- **Phylum Ascomycota** has **2 Classes**;
  - Class Hemiascomycetae and Class Euascomycetae.
- **Phylum Basidiomycota** has **2 classes**;
  - Class Homobasidiomycetae and Class Heterobasidiomycetae

# **KINGDOM ANIMALIA**

- Organisms without chlorophyll. No cell walls, heterotrophic, complex organ formations, etc.
- Has **3 sub Kingdoms**; Protozoa, Mesozoa and Metazoa.
- Protozoa is treated under Protista.
- Mesozoa are almost extinct
- Metazoa has **2 branches**; Parazoa and Eumetazoa.

- **1. Parazoa** contains the Porifers.
- Has **3 Phyla**; Asconoids, syconoids and Leuconoids.
- This describes the canals along which their cells are arranged.
- **2. Eumatozoa**; tissue organisms.
- Has **2 Superphyla**; Radiata and Bilateria

- **Super-phyla Radiata**; organisms have round shape.
- Has **1 phyla Coelenterata** which has **2 Sub-phyla** ;
- Subphyla : **Cnidaria and Ctenophora**
  1. **Cnidaria**- have the polyp and medusoid types. **Has 3 Classes** ; Hydrozoa, Scyphozoa, Anthozoa,
  - **2. Ctenophora has 2 subphyla**
  - Eg. *Pleurobranchia*

- Superphyla Bilateria has 3 Grades; Acoelomata, Pseudocoelomata and Coelomata
- **Grade Acoelomata;** Platyhelminthes Achelminthes (flatworms).
- **Grade Pseudocoelomata;** Nematoda and Rotifera
- **Grade Coelomata;** has 2 Super phyla; Invertebrata and Vertebrata.

- 1. **Superphylum Invertebrata**; These have no back bones.
- These are also known as **Protostomata**.
- They have **3 phyla**.
- These involve Phylum Annelida, Phylum Molluska and Phylum Arthropoda.

- 2. **Superphylum Vertebrata**; organisms have backbones . They are also referred to as **Deuterostoma**
- Have **2 phyla**; Echinodermata and Chordata
- **Phylum Chordata** involves the **5 classes** ;
- Pisces (fishes) Amphibia, Reptalia, Aves and Mammalia.
- Discuss differences between the classes !

# GOOD LUCK

- MERRY CHRISTMAS