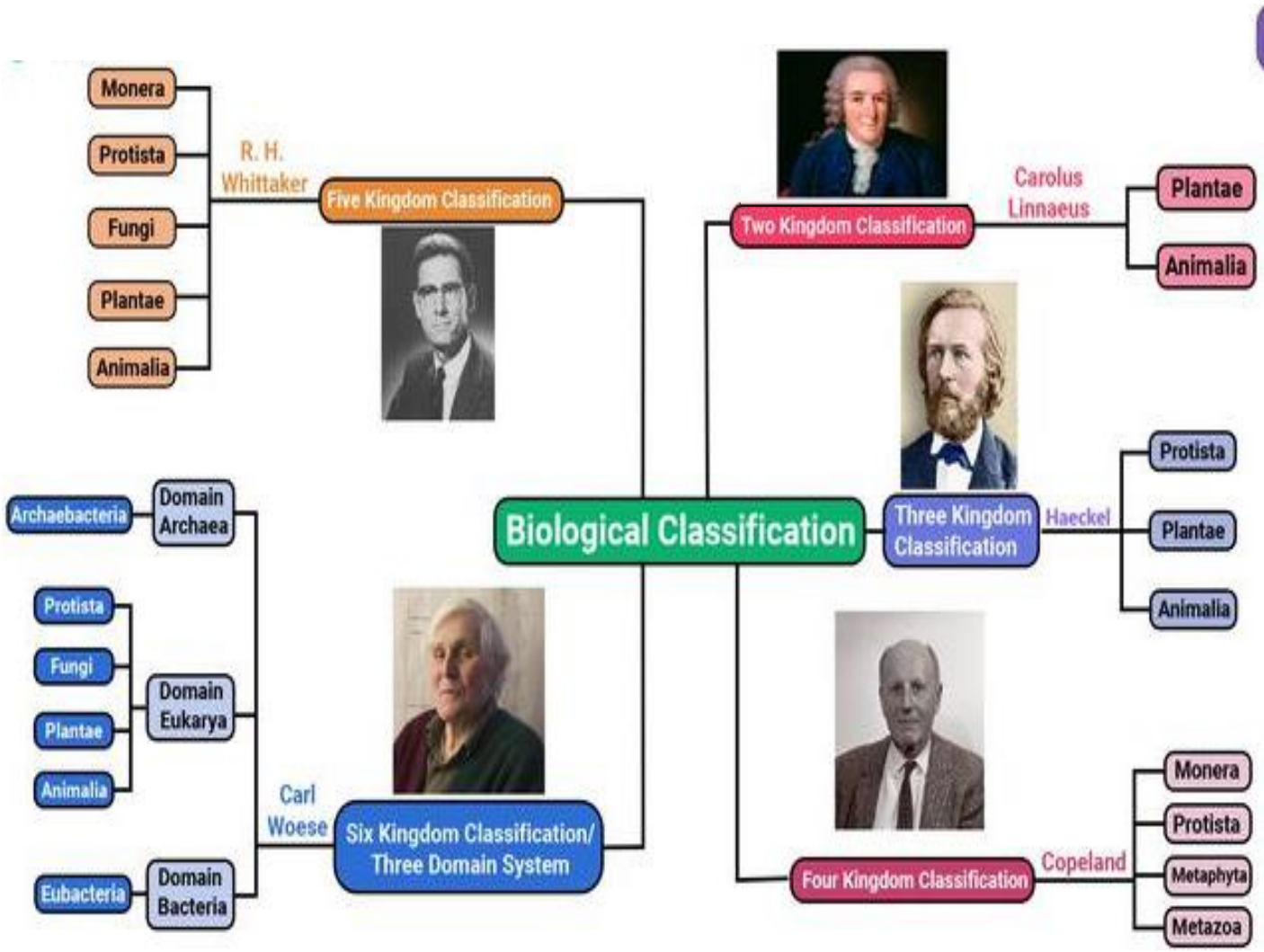
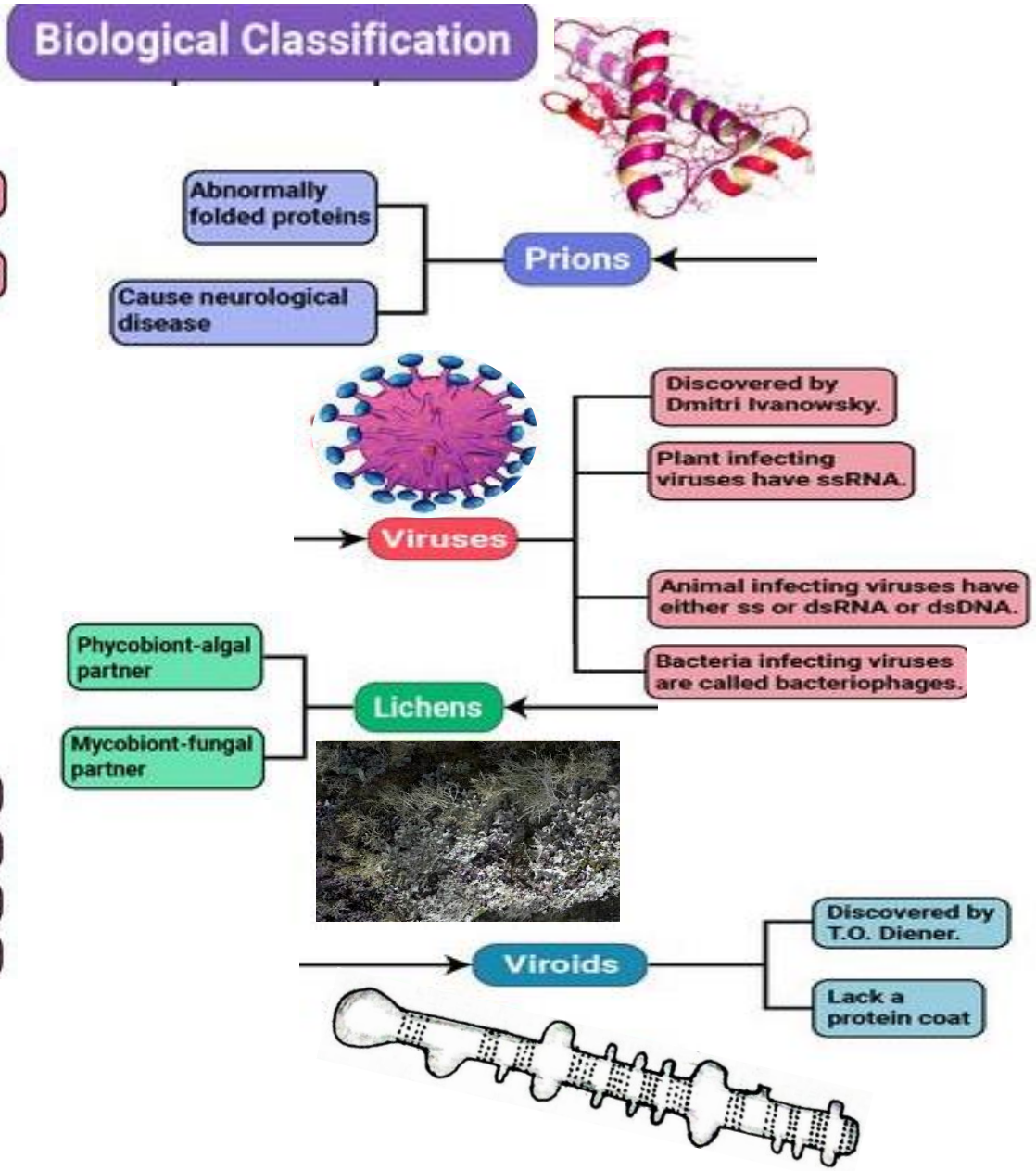
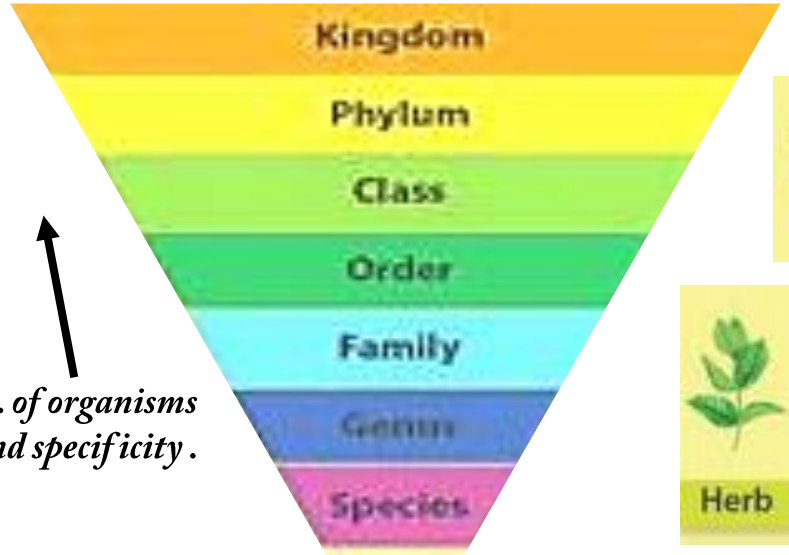
CHAPTER : 2 BIOLOGICAL WORLD



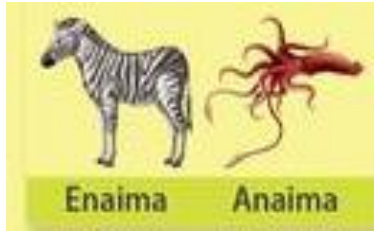


LEVELS OF CLASSIFICATION :

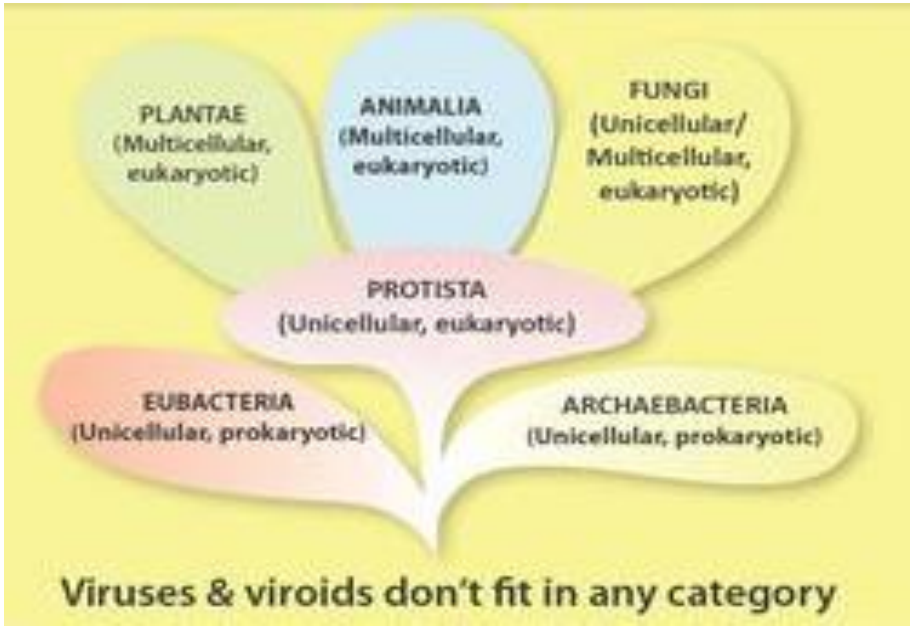


No. of organisms and specificity .

First Attempt of Classification



BIOLOGICAL CLASSIFICATION :



KEY FEATURES AND TYPES OF CLASSIFICATION SYSTEM :

2 KINGDOM

Classified organisms into 2 kingdoms

Given by Linnaeus in 1758
- Plantae
- Animalia

3 KINGDOM

Added Protists: Lacked capability of tissue differentiation

Given by Ernst & Haeckel in 1866
- Protista
- Plantae
- Animalia

4 KINGDOM

Added Monera: EM studies showed prokaryotes possess different nuclear structure

Given by Copeland in 1956
- Monera
- Protista
- Plantae
- Animalia

5 KINGDOM

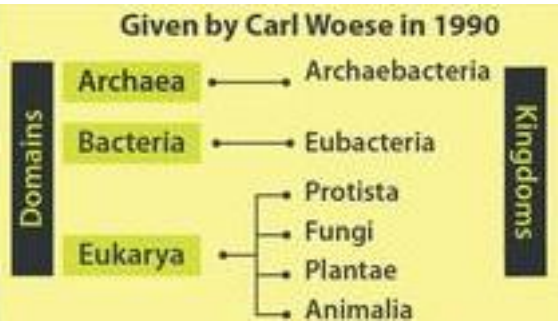
Separate group of Fungi. Classified on the basis of 5 criteria.

Given by R.H. Whittaker in 1969
- Monera
- Protista
- Fungi
- Plantae
- Animalia

6 KINGDOM

3 domains divided into 6 kingdoms

Given by Carl Woese in 1990

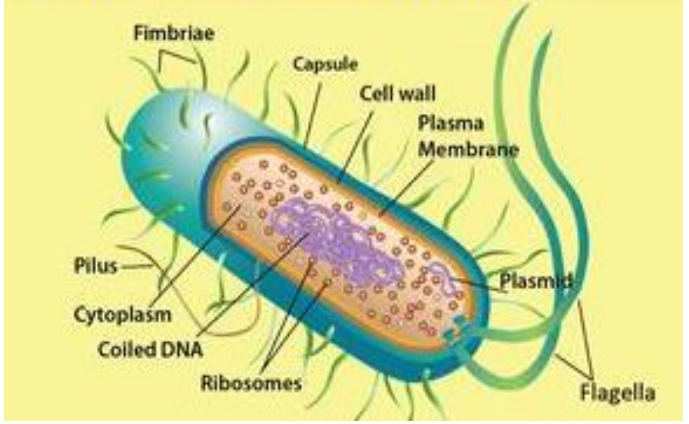


1. MONERA :

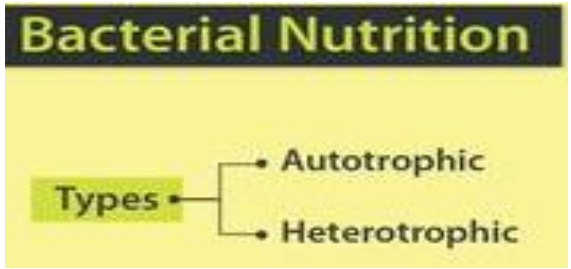
Features of Kingdom Monera

- Unicellular organisms (except 1 mycelial group)
- **Genetic material:** Naked coiled DNA
- Nucleus & cytoplasmic organelles absent
- Cytoplasmic organelles: Both types of ribosomes; free and polysomes, simple chromatophores
- Gas vacuole may be present instead of sap vacuole
- **Mode of nutrition:** Absorptive, photosynthetic & chemosynthetic
- **Motility:** Non-motile, simple flagellar or gliding

Structure of Bacterial Cell



Bacterial Nutrition



Shapes

2. PROTISTA :

Features of Kingdom Protista

- Unicellular organisms
- Primarily aquatic
- Link between plants, animals & fungi
- Well-defined nucleus & membrane-bound organelles
- Reproduction: Asexual & sexual
- Mode of nutrition: Photosynthetic, holotrophic & mixotrophic

Grouping of Protists

Photosynthetic	Consumer	Protozoan
• Dinoflagellates • Diatoms • Euglenoids	• Slime moulds • Myxomycetes	• Zooflagellates • Sarcodina • Sporozoa • Ciliata

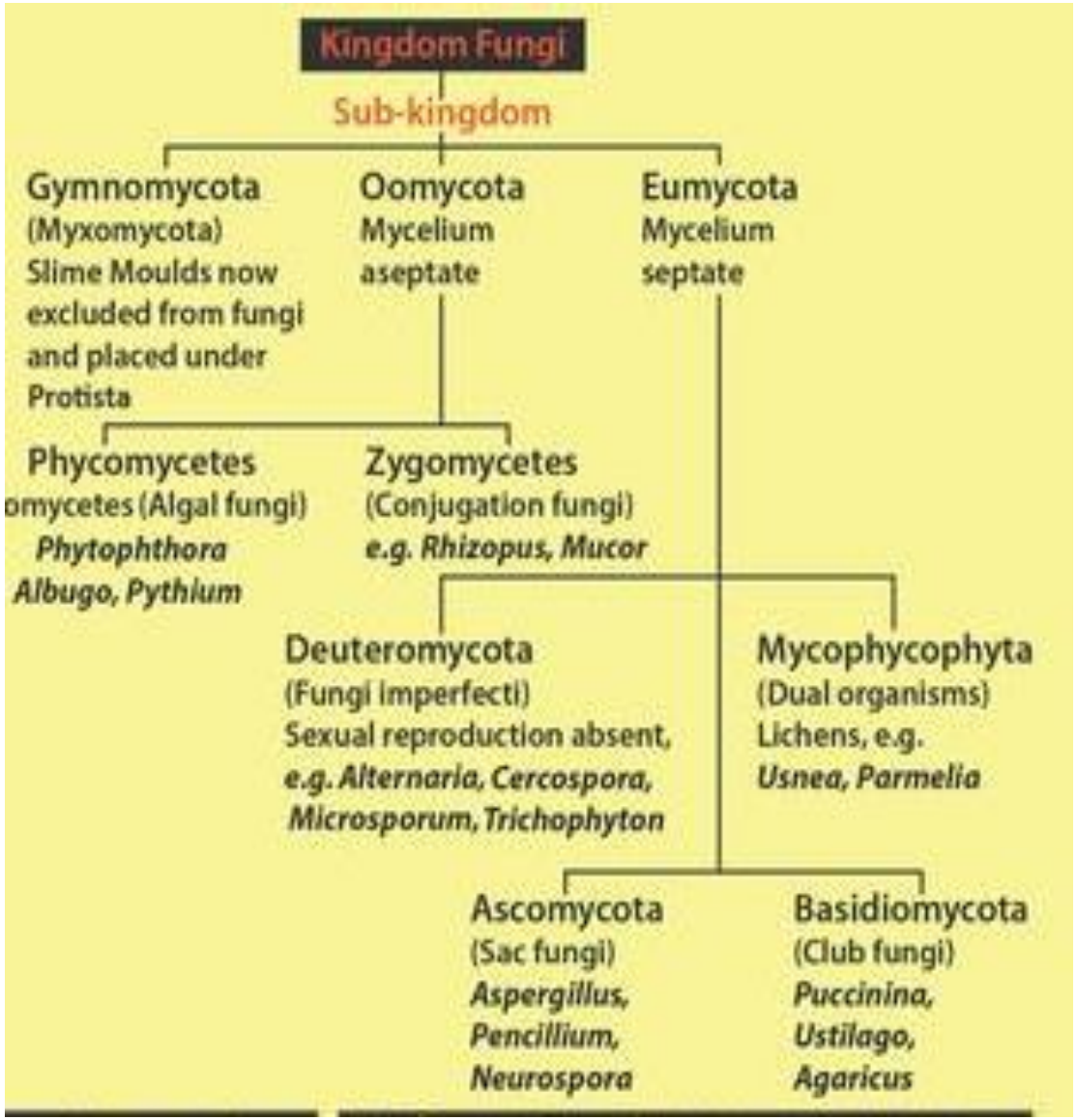
Major Protist Groups

- Chrysophytes
- Dinoflagellates
- Protozoans
- Euglenoids
- Slime moulds

3. FUNGI :

Features of Kingdom Fungi

- **Thallus organisation:** Mycelial, non-mycelial
- **Cell organisation:** Made of chitin & cellulose
- **Cell-wall:** Cellulose-glycogen, cellulose-chitin or polygalactosamine-galactan
- **Nutrition:** Parasitic, saprophytic, symbiotic
- **Reproduction:**
  - **Vegetative:** fragmentation, budding & fission
  - **Asexual:** Sporangiospores, zoospores & conidia
  - **Sexual:** In all fungi (except Deuteromycotina)
- **Classification:** Phycomycetes *(Rhizopus/Mucor, Albugo)*, Ascomycetes (Yeast), Basidiomycetes, Deuteromycetes



Virus: Not truly living species

- **Genetic material:** DNA or RNA
- Nucleoprotein & genetic material
- Capsid protects nucleic acid

Viroids: Lack protein coat

- Smaller than virus
- RNA has low molecular weight

Lichens: Symbiotic associations

- Symbiosis between algae & fungi
- Algal component: Phycobiont
- Fungal component: Mycobiont

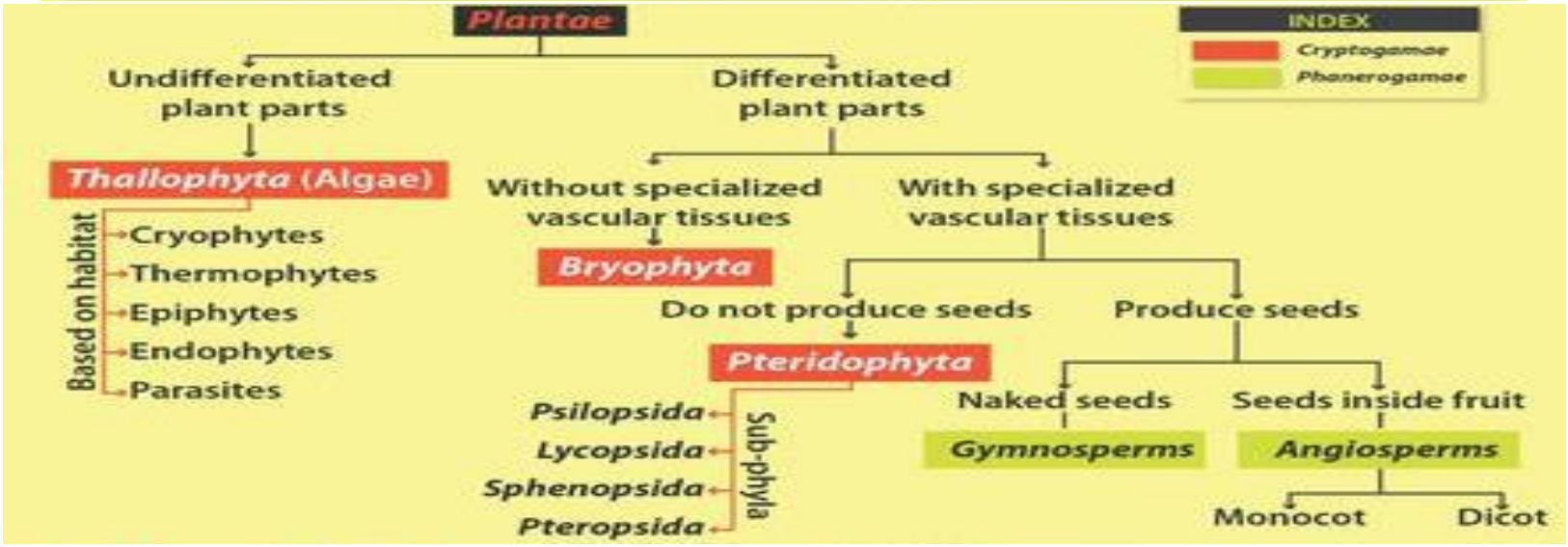
4. PLANTAE :

Features of Kingdom Plantae

- Presence of cell wall, multicellular & frequently vacuolated
- Plastids containing photosynthetic pigments present
- **Motility:** Non-motile & live, anchored to a substrate
- **Reproduction:**
  - Asexual & sexual
  - Form multicellular embryo
  - Algae lack embryo stage
- **Life cycle:** Show alternation of generation

Varieties in Kingdom Plantae

Classification in Kingdom Plantae



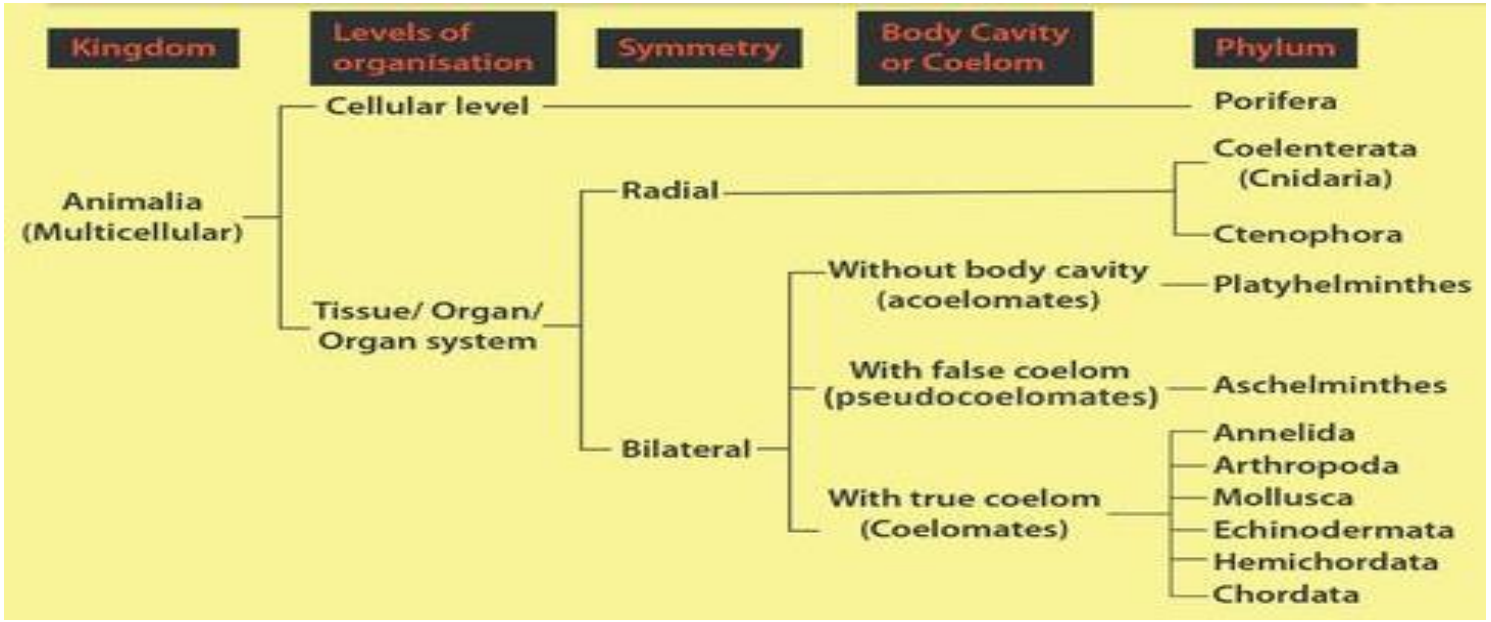
Classification System

5. ANIMALIA :

Basis of Classification in Kingdom Animalia

- **Body symmetry:** Asymmetrical, radial symmetry, bilateral symmetry
- **Nature of coelom:** Coelomate, acoelomate
- **Arrangement of cells of embryonic layers:** Diploblastic & triploblastic
- **Notochord:** Chordate, non-chordate
- **Patterns of organ systems:** Digestive system (incomplete & complete framework), circulatory system (open & closed type), reproductive system framework
- **Segmentation:** External & internal segments with serial repetition of some organs
- **Levels of organization:** Cellular level, tissue level, organ level & organ system level

Attributes & Hierarchy Patterns of Kingdom Animalia



ANIMALIA :