FIVE KINGDOM CLASSIFICATION

Submitted to:
Hiranmayee Ma'am
(Biology teacher)

Prepared by:
Vivek Ranjan Sahoo
Std.: IX 'A' Roll no._60

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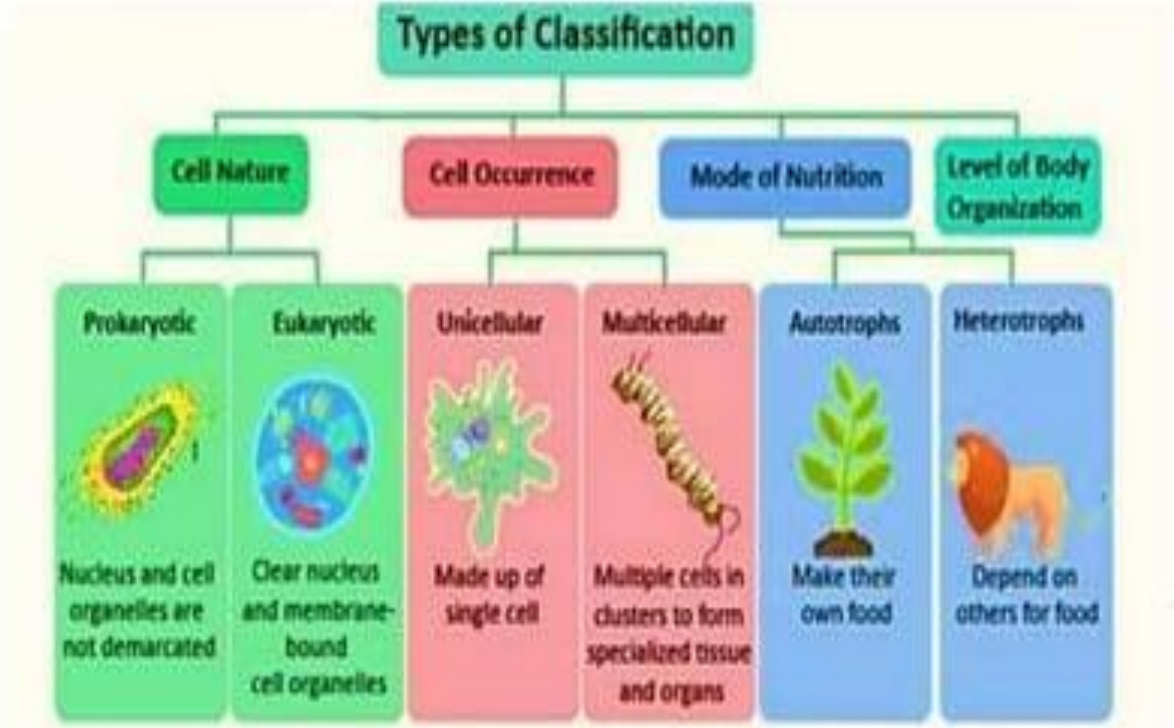
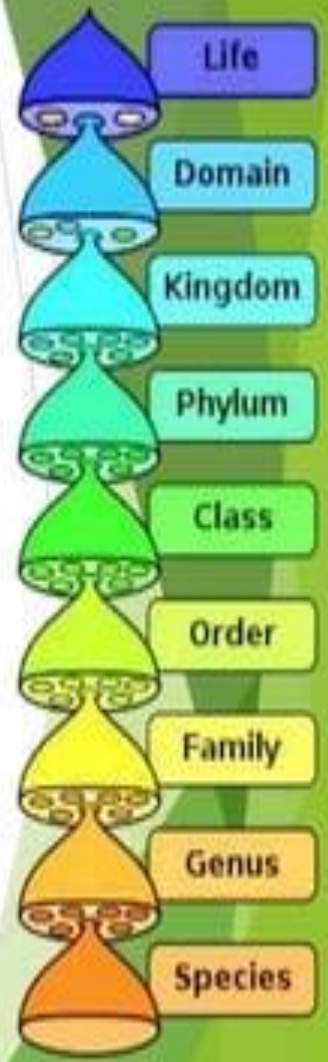
Why do we classify organisms?

- Classification makes the study of organisms much easier, as there are millions of lifeforms and we cannot study them one by one. We can study the different classes or groups much easier after classifying them.





Basis of classification of living organisms

Characteristics considered for classification of living organisms into different groups are :-

- Whether they are made of prokaryotic or eukaryotic cells.
- Whether the cells occur singly or they are grouped together and live as an invisible group.
- Whether they produce their own food by photosynthesis or get their own food from outside.
- Of the organisms which produce their own food (plants) what is the level of organization of their body?
- Of the animals what is the level of organization of their body and what are their special organs and their functions?

Animals
Organisms able to move on their own.

Chordates
Animals with a backbone.

Mammals
Chordates with fur or hair and milk glands.

Primates
Mammals with collar bones and grasping fingers.

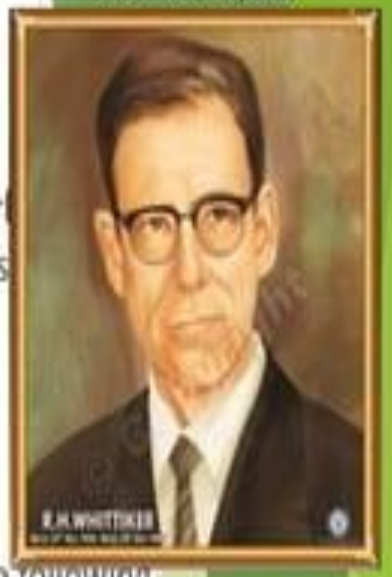
Hominids
Primates with relatively flat faces and three-dimensional vision.

Homo
Hominids with upright posture and large brains.

Homo sapiens
Members of the genus Homo with a high forehead and thin skull bones.

The Hierarchy Of Classification - Groups

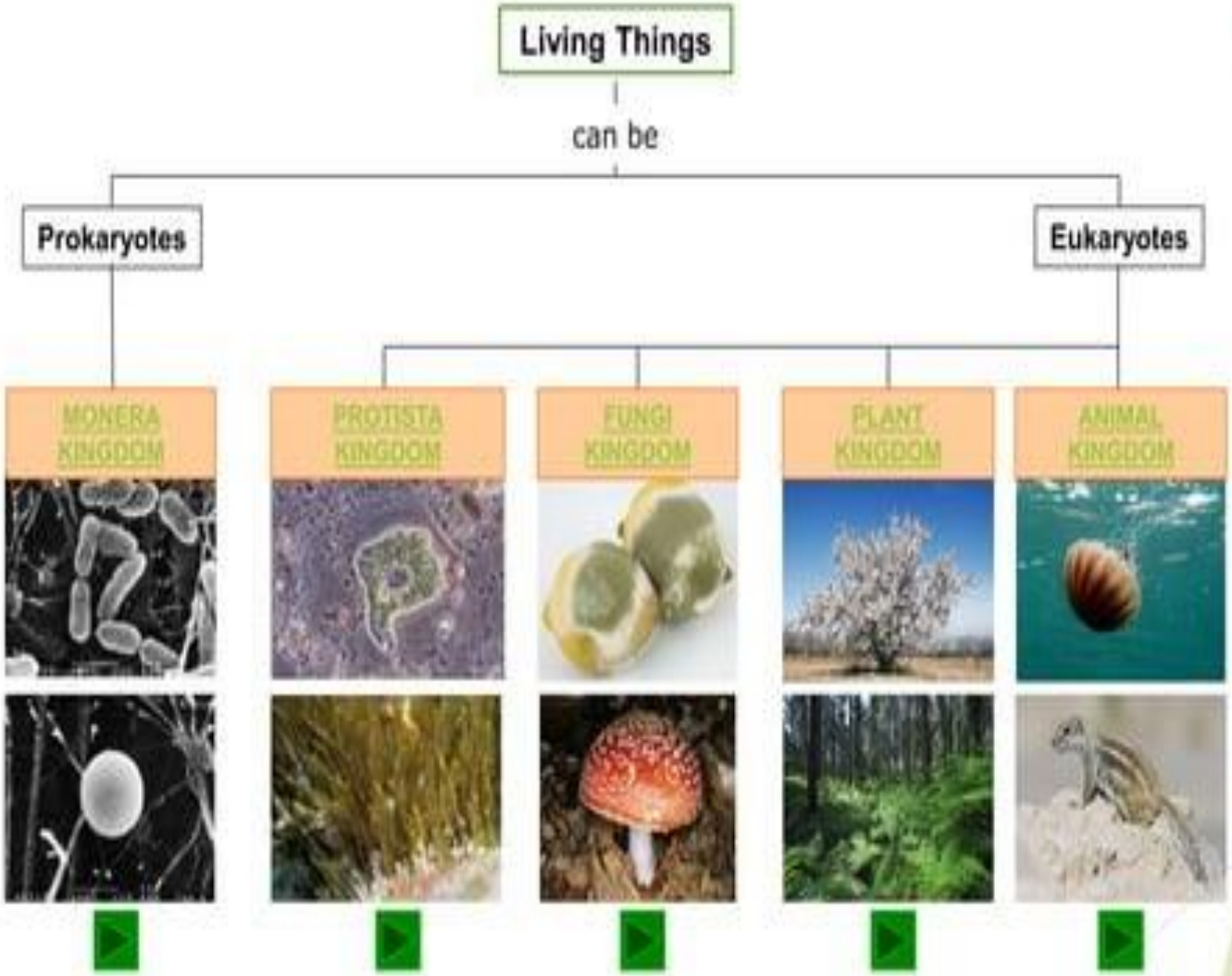
Click on the photo to know more about him. (Wikipedia)



- Biologists, such as Ernst Haeckel (1894), Robert Whittaker (1969) and Carl have tried to classify all living organisms into broad categories, called kingdoms. classification Whittaker proposed has five kingdoms:
- Monera, Protista, Fungi, Plantae and Animalia, and is widely used.

- Further classification is done by naming the sub-groups at various levels as shown in the following scheme:
- Kingdom > Phylum (for plants)/ Division (for animals) > Class > Order > Family > Genus > Species
- Thus, by separating organisms on the basis of a hierarchy of characteristics into smaller and smaller groups, we arrive at the basic unit of classification, which is a 'species'. Broadly, a species includes all organisms that are similar enough to breed and perpetuate.
- The important characteristics of the five kingdoms of Whittaker are as follows :

THE FIVE KINGDOMS

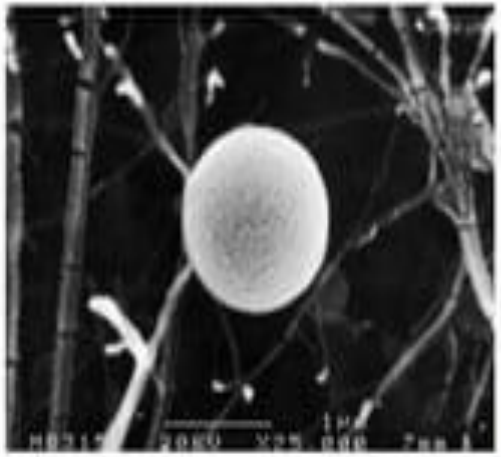


Click on the green buttons to find out more about each kingdom

KINGDOM MONERA

- Unicellular and Prokaryotic.
- True nucleus and membrane bound organelles are absent.
- Monerans are mainly Bacterias.
- Some of them have cell wall (bacteria and BGA) and some of them don't have cell wall (mycoplasma).
- The mode of nutrition is either Autotropic(make their own food) or Hetetopic(depending on other organisms for food)
- Have two Major groups-
  1. Eubacteria(true bacteria).It includes bacteria and cynobacteia
  2. Archaebacteria (ancient bacteria)
- Examples- *E.coli , Bacteria, Anabaena, etc.*

Rod-shaped (bacillus) bacteria

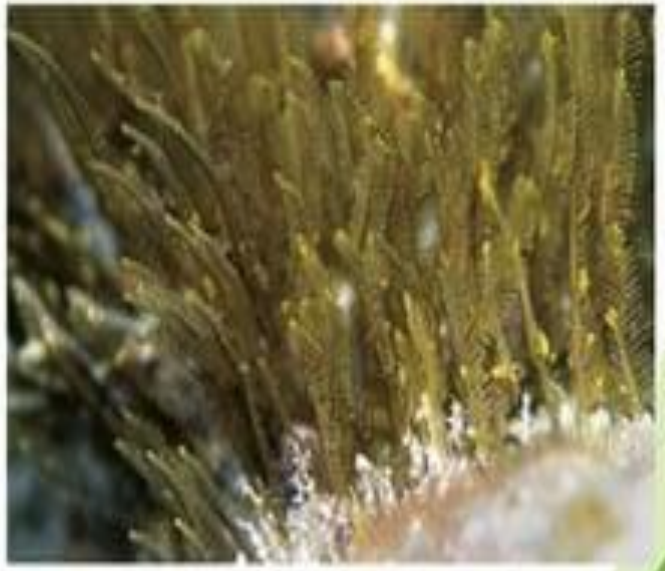


Coccus-shaped bacteria

KINGDOM PROTISTA

- Unicellular and Eukaryotic.
- True nucleus is Present.
- Protista are mainly Protozoans.
- Microscopic organisms.
- The structures like cilia, flagella and pseudopodia are presented in these organisms which help in locomotion and food capturing.
- Examples – *Diatoms, amoeba, paramecium, algae, euglena, etc.*

Amoebae



Algae

KINGDOM FUNGI

- Heterotrophic and Eukaryotic.
- Mainly have Multicellular body with the exception of yeast which is unicellular fungi.
- True nucleus is Present.
- Their cell wall is made up of chitin (a tough complex sugar).
- They have saprophytic nutrition i.e. live on the dead and decaying matter. Hence they are also called Saprophytes.
- Examples- *Yeast , Penicillium, aspergillus, penicillium, etc.*

Moulds

Mushrooms

KINGDOM PLANTAE

- They are Eukaryotic, Multicellular and Autotrophs.
- They have an additional covering on plasma membrane called Cell membrane.
- They have cell wall, made up of cellulose and chlorophyll pigments which help in photosynthesis.
- Presence of vascular tissues (xylem, phloem).
- They are non-motaile or static.
- The plant kingdom is classified into 5 phylum.

Ferns

Almond tree

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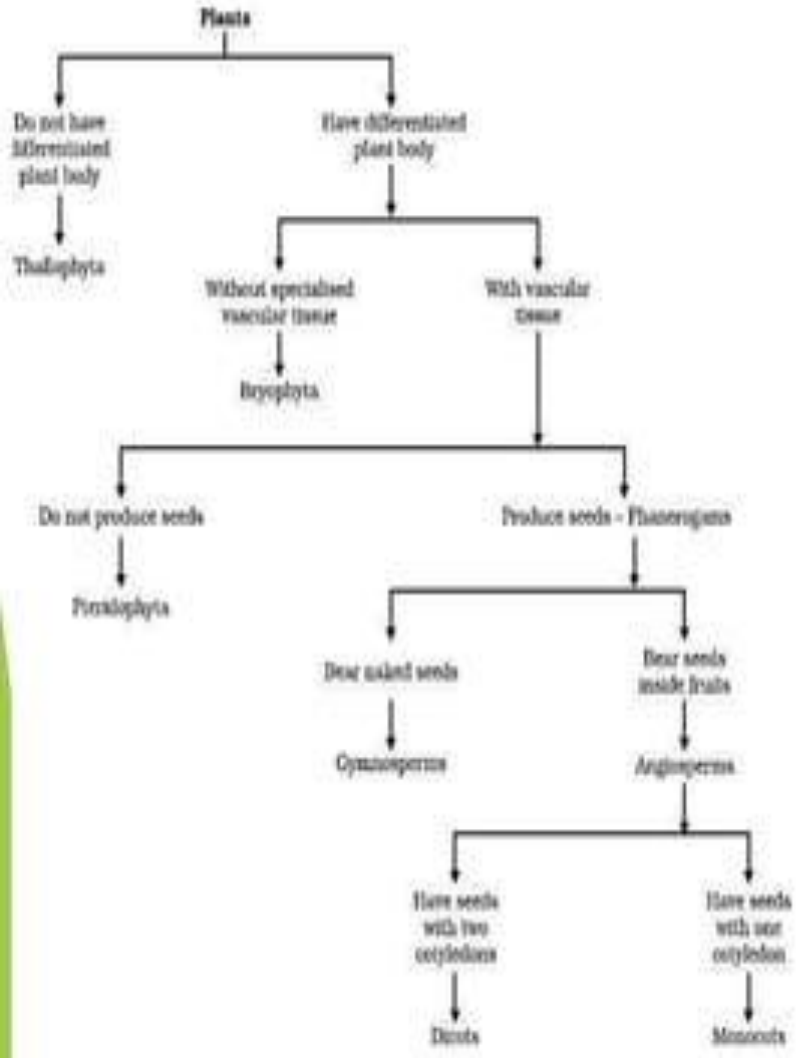

Fig. 7.11: Classification of plants

The Plant Kingdom is divided in 5 phylum.

- The first level of classification among plants depends on whether the plant has well-differentiated, distinct parts.

The next level of classification is based on whether the differentiated plant body has special tissues for the transport of water and other substances.

- Further classification looks at the ability to bear seeds and whether the seeds are enclosed within fruits.

- Thallophyta
- Bryophyta
- Pteridophyta
- Gymnosperms
- Angiosperms

KINGDOM ANIMALIA

- They are Eukaryotic and Multicellular.
- They are Heterotrophs (means having heterotopic nutrition).
- They do not have cell wall and chlorophyll pigments.
- Generally have locomotory organs and are motaile.
- They have a well developed sensory and neuromuscular system.
- This group contains all invertebrates and vertebrates.
- The animal kingdom is classified into 10 divisions.

Jellyfish

Squirrel

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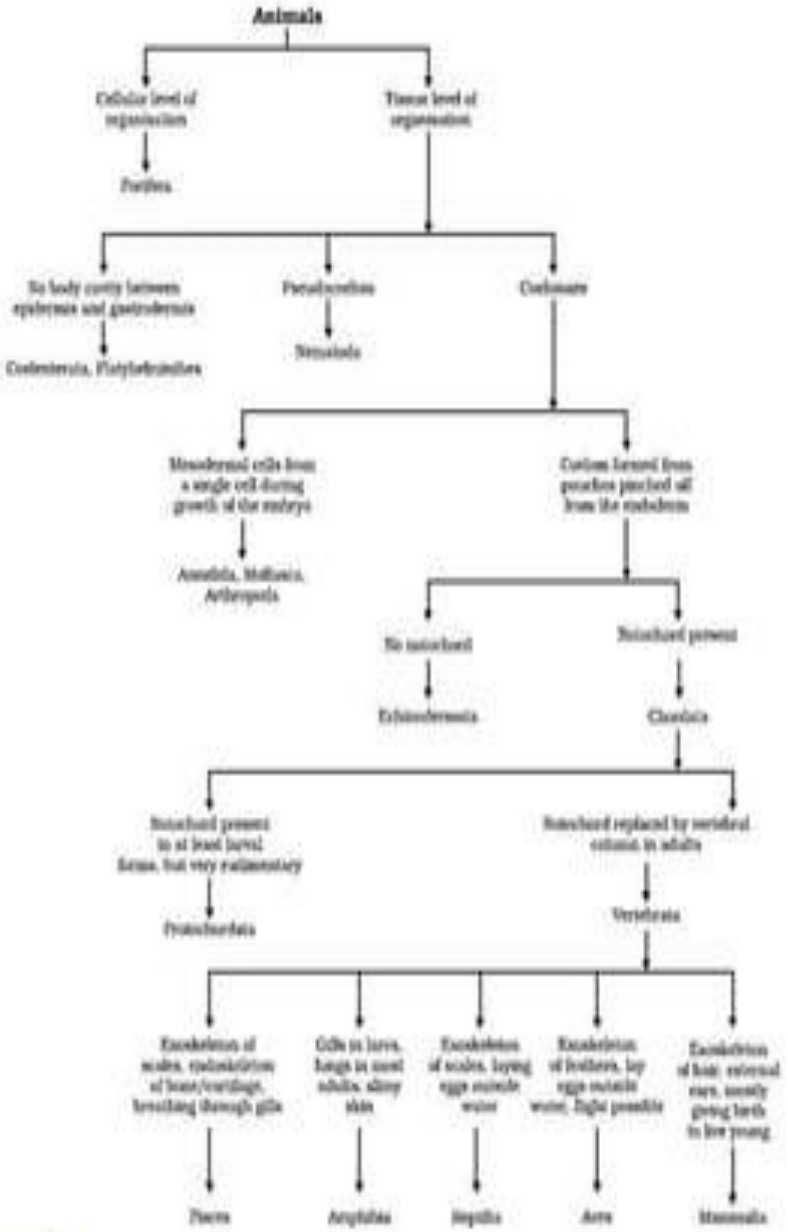
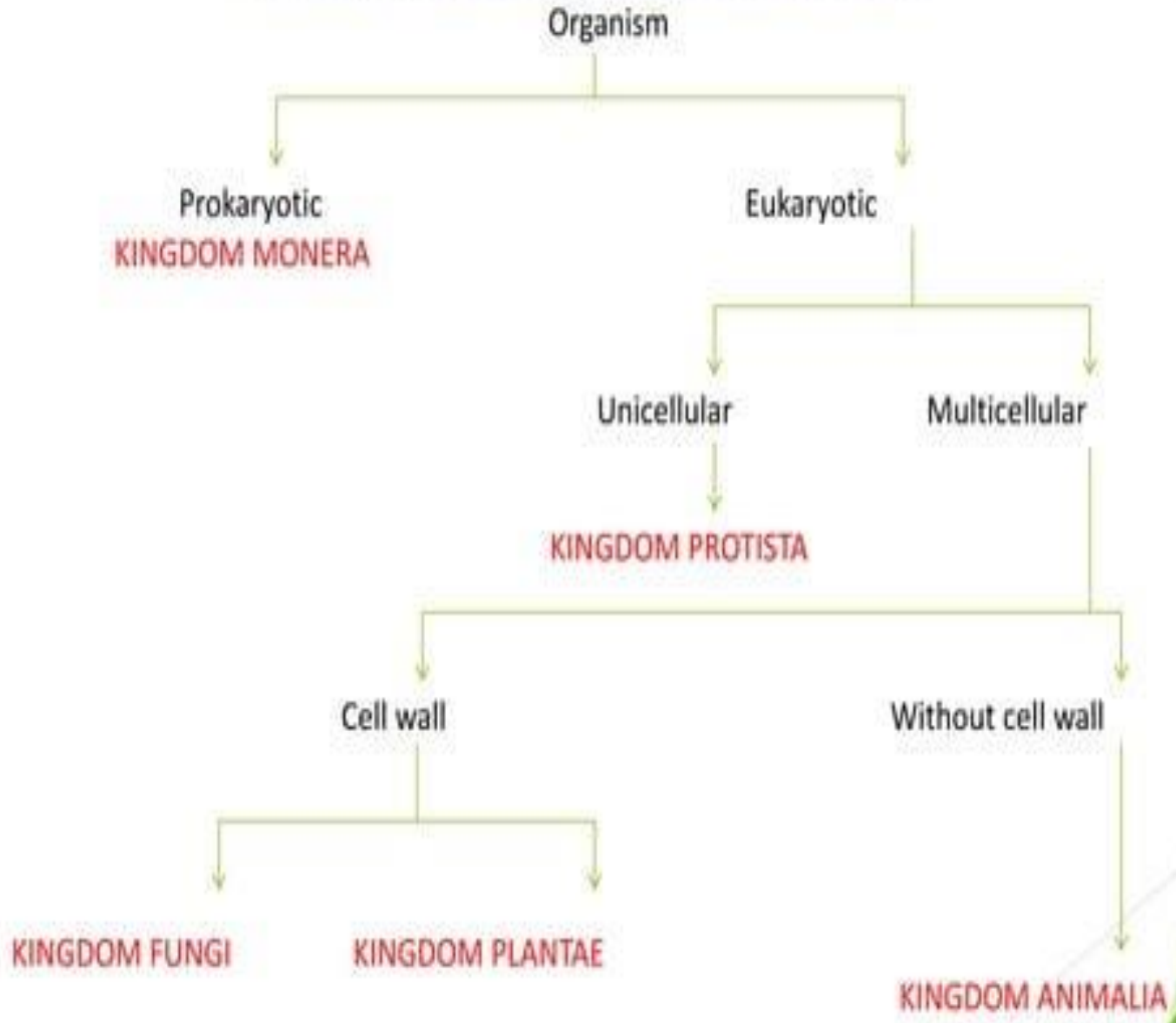


The animal kingdom is classified into 10 divisions

They are further classified based on the extent and type of the body design differentiation found.

- Porifera (pores having animals)
- Coelenterata (Cnidaria)
- Platyhelminthes (flat worms)
- Nematoda (Aschelminthes)
- Annelida (segmented worms)
- Arthropoda (animals with joined legs)
- Mollusca (soft)
- Echinodermata (spiny skinned animals)
- Protochordata
- Vertebrata
  - i. Cyclostomata
  - ii. Pisces
  - iii. Amphibia
  - iv. Reptilia
  - v. Aves
  - vi. Mammalia

FIVE KINGDOM CLASSIFICATION



Nomenclature

- Assigning two names to a particular species is known as Binomial Nomenclature. It was first proposed by Carolus Linnoeus. He popularly known as Father of Taxonomy.
- The scientific name of every species has two parts-
- Genus or generic name and Species or specific epithet.
- Example- *Homo sapiens*

  Genus Species
- Binomial Nomenclature is guided by a set of rules stated by ICBN and ICZN. The following conventions are to be followed while writing the scientific names:
  - ✓ The name of the genus begins with the capital letter.
  - ✓ The name of the species begins with the small letter.
  - ✓ When written by hand, the genus and the species are underlined separately.
  - ✓ When printed the scientific names are written in Italics.

Recapitulation

- Classification helps us in exploring the diversity of life forms.
- The major characteristics considered for classifying all organisms into five kingdoms are:
  a) Whether they are made of prokaryotic or eukaryotic cell.
  b) Whether the cells are living singly or organised into multicellular and thus complex organisms
  c) Whether the cells have a cell-wall and whether they prepare their own food.
- All living organisms are divided on the above bases into five kingdoms, namely Monera, Protista, Fungi, Plantae and Animalia.
- The classification of life forms is related to their evolution.
- Plantae and Animalia are further divided into subdivisions on the basis of increasing complexity of body organisation.
- Plants are divided into five groups.
- Animals are divide into ten groups.
- The binomial nomenclature makes for a uniform way of identification of the vast diversity of life around us.
- The binomial nomenclature is made up of two words- a generic name and a specific name.

THANK YOU

Hope you enjoyed and understood the concept. Thank You !