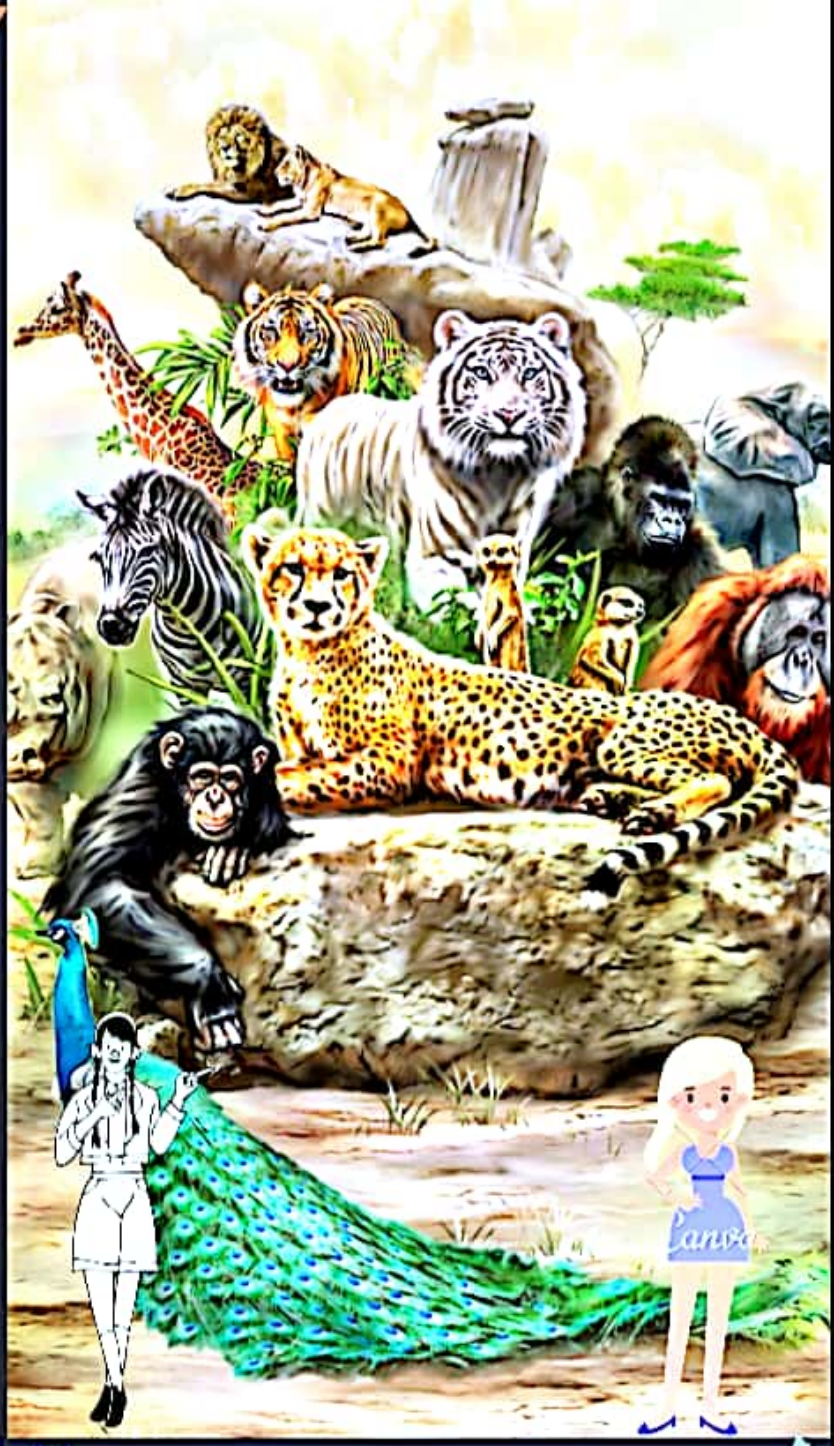
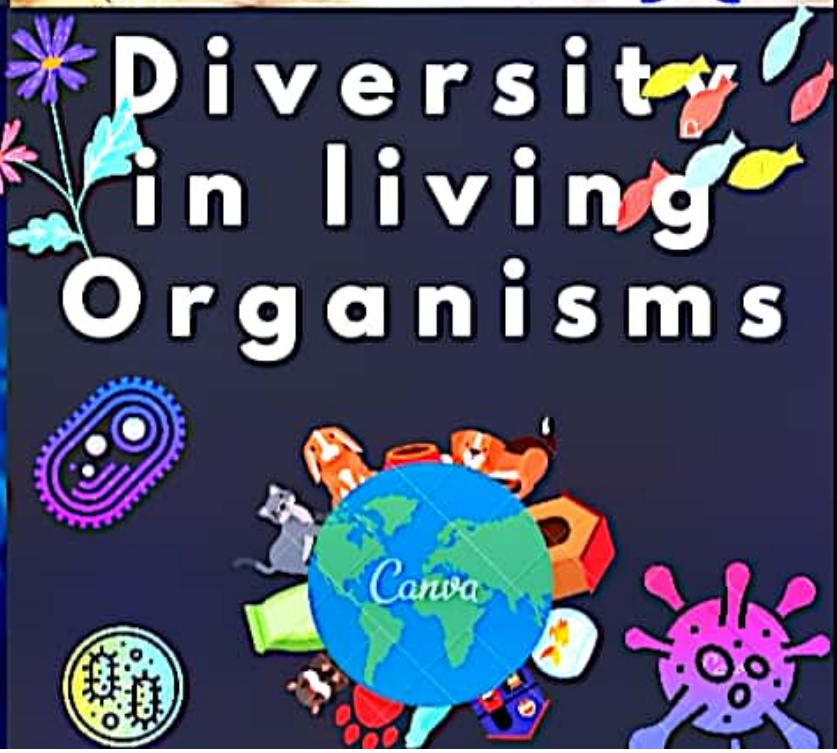
KRISHNAGAR ACADEMY

BIOLOGY

Class -9



Diversity in living Organisms



The arrangement of organisms into groups; on the basis of their morphological, anatomical, physiological, and other similar or different features exhibiting their relationships; is known as ***classification.***

Hierarchy of classification:

Kingdom

(All organisms that shares some common characters)

↑

Phylum

(All organisms belonging to various classes having a few common characters)

↑

Class

(Organisms of related order)

↑

Order

(A group of related families)

↑

Family

(A group of related genera with certain similar characters)

↑

Genus

(Group of species that are related and have less similar characters as found among a particular species)

↑

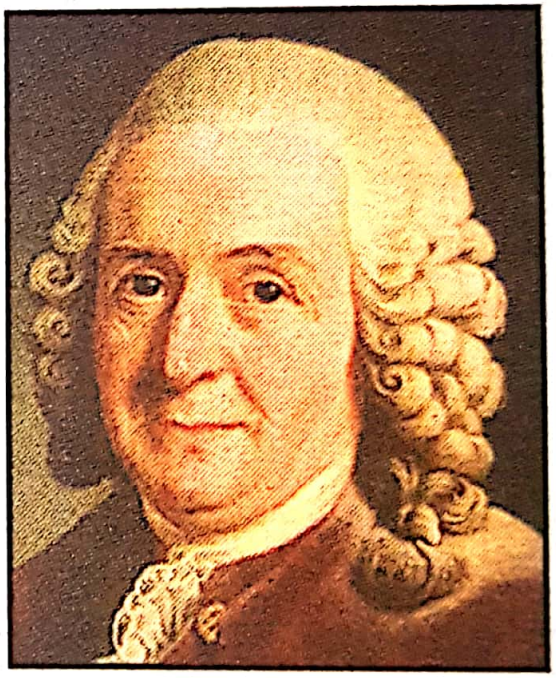
Species

(Group of organisms with similar characters, and also which can interbreed)

The science of classification of organisms is known as **taxonomy**. All categories together constitute the taxonomic **hierarchy**.

Carl Linnaeus

(1707–1778)



Carl Linnaeus was born in 1707 in Sweden and was a doctor by profession. He had great interest in nature and in the collection and classification of organisms. In 1735, he published his first book *Systema Naturae*, based on taxonomy. Later, he published 14 papers and two more books related to the classification of organisms. Linnaeus also introduced the **Binomial System** of Nomenclature. His system facilitated the identification and classification of organisms into groups, based upon their related external features rather than evolutionary features.

Importance of Classification

Classification is an important part of Biological Science.

- It helps us to study the wide variety of organisms easily.
- It projects a picture of all life forms at a glance.
- It makes us understand the inter-relationships among different groups of organisms.
- It serves as a base for the development of other biological species.
- It makes possible the progress in the ecological and behavioural sciences.
- It forms the basis to understand the various fields of applied biology.

Two kingdom classification: It was given by Linnaeus (1758). He classified all the organisms in the world into two kingdoms, namely Kingdom Plantae and Kingdom Animalia.

Kingdom Plantae: Included all plants and Kingdom Animalia included all animals. But this system had certain drawbacks.

For example:

(*i*) Unicellular organisms like ***Euglena*** possess some characteristics of plants (possess chloroplast) as well as some characteristics of animals (have mouth for feeding and contractile vacuole for excretion).

(*ii*) **Fungi** were placed under Kingdom Plantae but they lack chlorophyll and derive nutrition from dead remains of plants and animals.

Five kingdom classification: Robert H.Whittaker in 1959 classified the organisms into the following five kingdoms based on the following criteria:

(*i*) structure of cell (whether prokaryotic or eukaryotic).

(*ii*) mode of nutrition (whether autotrophic or heterotrophic).

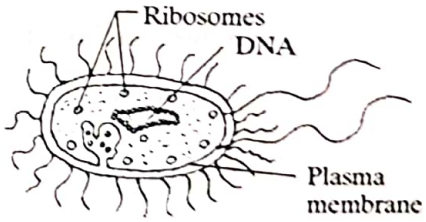
(*iii*) body organisation (whether unicellular or multicellular).

The five kingdoms are as follows:

(*i*) **Kingdom Monera:**

The organisms are prokaryotic (well-defined nucleus absent) and single-celled. Cell wall may or may not be present.

They may be autotrophic or heterotrophic, e.g. bacteria, cyanobacteria and mycoplasma.

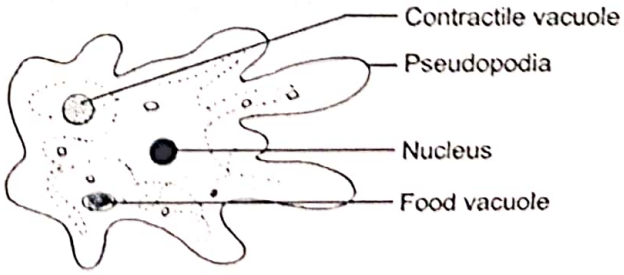


Bacteria

(*ii*) **Kingdom Protista:**

The organisms are unicellular eukaryotes. Some are animal-like and some are plant-like. Nutrition–autotrophic or heterotrophic. They move with cillia, flagella, pseudopodia, etc.

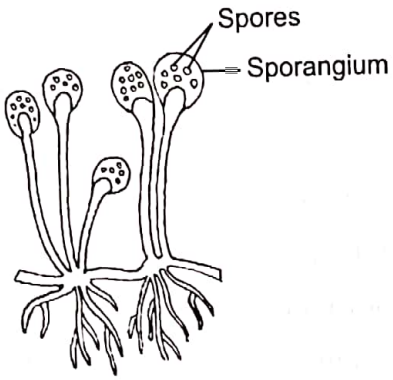
e.g. Algae, protozoans, diatoms, etc.



Protozoan (*Amoeba*)

(*iii*) **Kingdom Fungi:**

They are multicellular, eukaryotic and heterotrophic. Cell wall is made up of chitin, e.g. *Rhizopus*, *Agaricus*, etc.



Rhizopus

Agaricus

(*iv*) **Kingdom Plantae:**

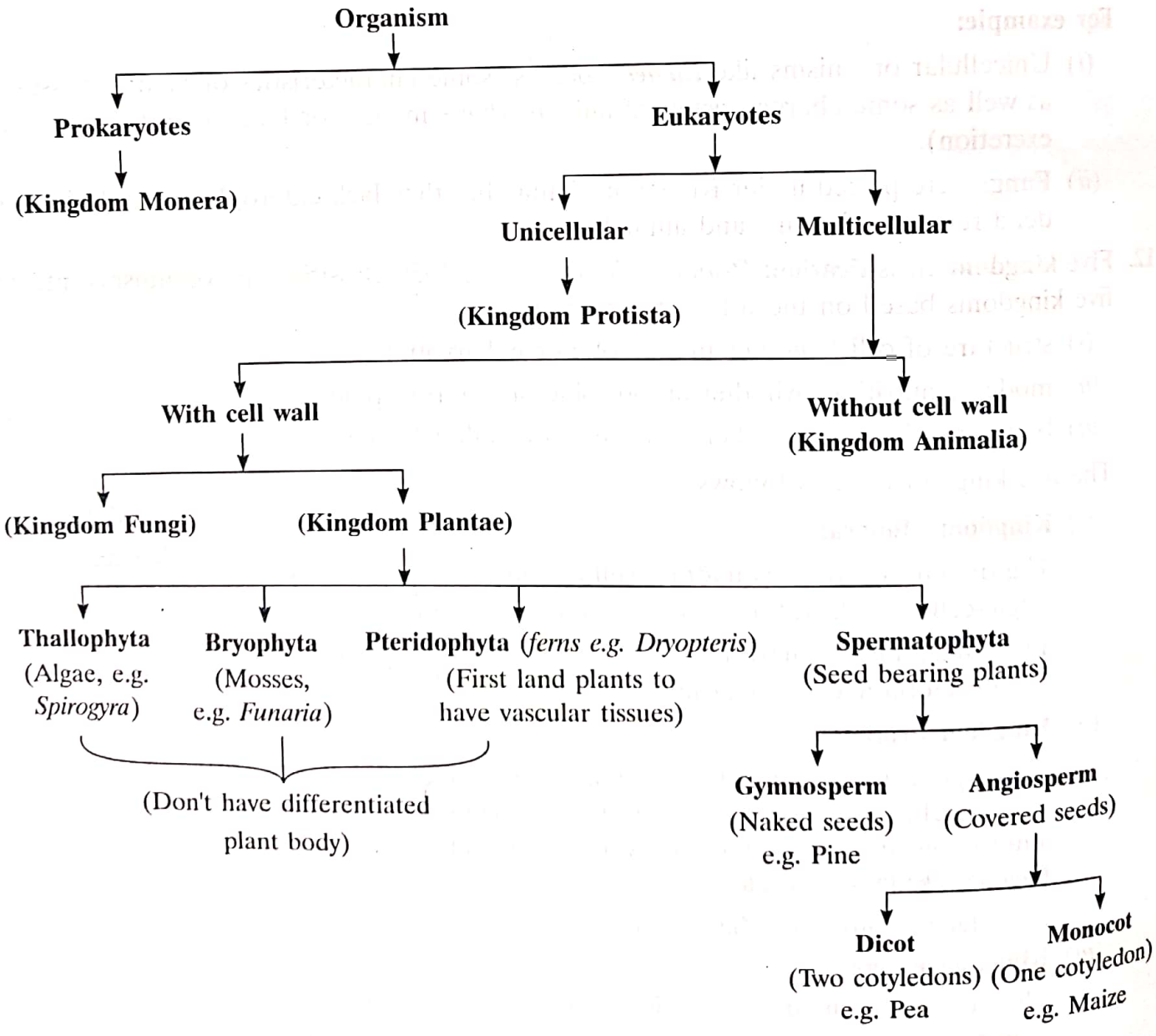
Multicellular, eukaryotic with cell wall (made up of cellulose). They are autotrophs.

This Kingdom has the following groups:

Thallophyta, bryophyta, pteridophyta, gymnosperm and angiosperm.

(*v*) **Kingdom Animalia:**

Multicellular, eukaryotic without cell wall and are heterotrophs.



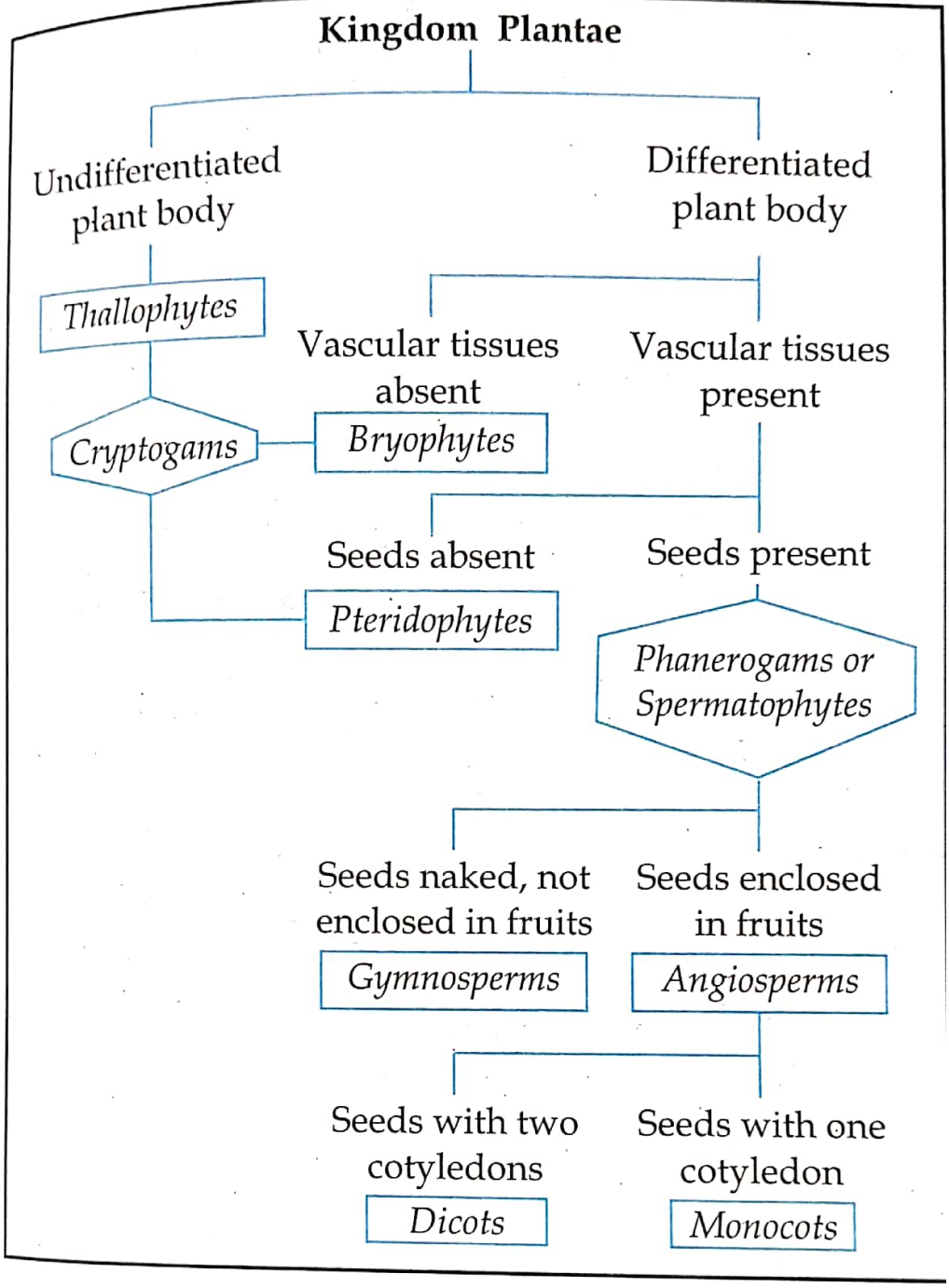


Fig. 8.11: Classification of plants

At A Glance

- Thallophytes, Bryophytes and Pteridophytes have hidden reproductive organs, naked embryos, and lack seeds, flowers and fruits. They are collectively called **cryptogams**.
- The gymnosperms and angiosperms have well-developed reproductive tissues, form seeds containing embryos and food, and may bear fruits and flowers. These collectively form **spermatophytes** or **phanerogams**.

HOME TASK

1. Define : Classification, Taxonomy, Species, rhizoid, lichens.

2. Differentiate : a) Prokaryotic & eukaryotic.
   b) Autotroph & heterotroph.
   c) Fungi & Plantae.
   d) Cryptogams & phanerogams
   e) Monocot & dicot.

3. Mention the importance of classification.

4. Why are bryophytes called amphibians of the plant kingdom?

5. Classify plant kingdom.