VIKRANT

For CDS-1 2023 Exam

Lecture – 04
Diversity in living organisms
(BIOLOGY)

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Topics To Be Covered

1. Diversity in living organisms

Classification

Kingdoms

Plantae Kingdom

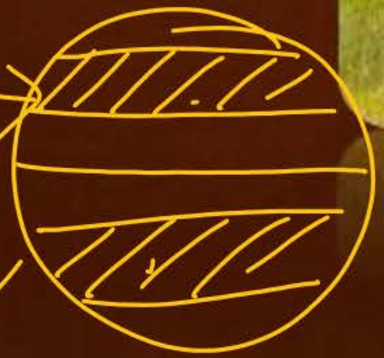
Biodiversity

Biodiversity is all the different kinds of life you'll find in one area

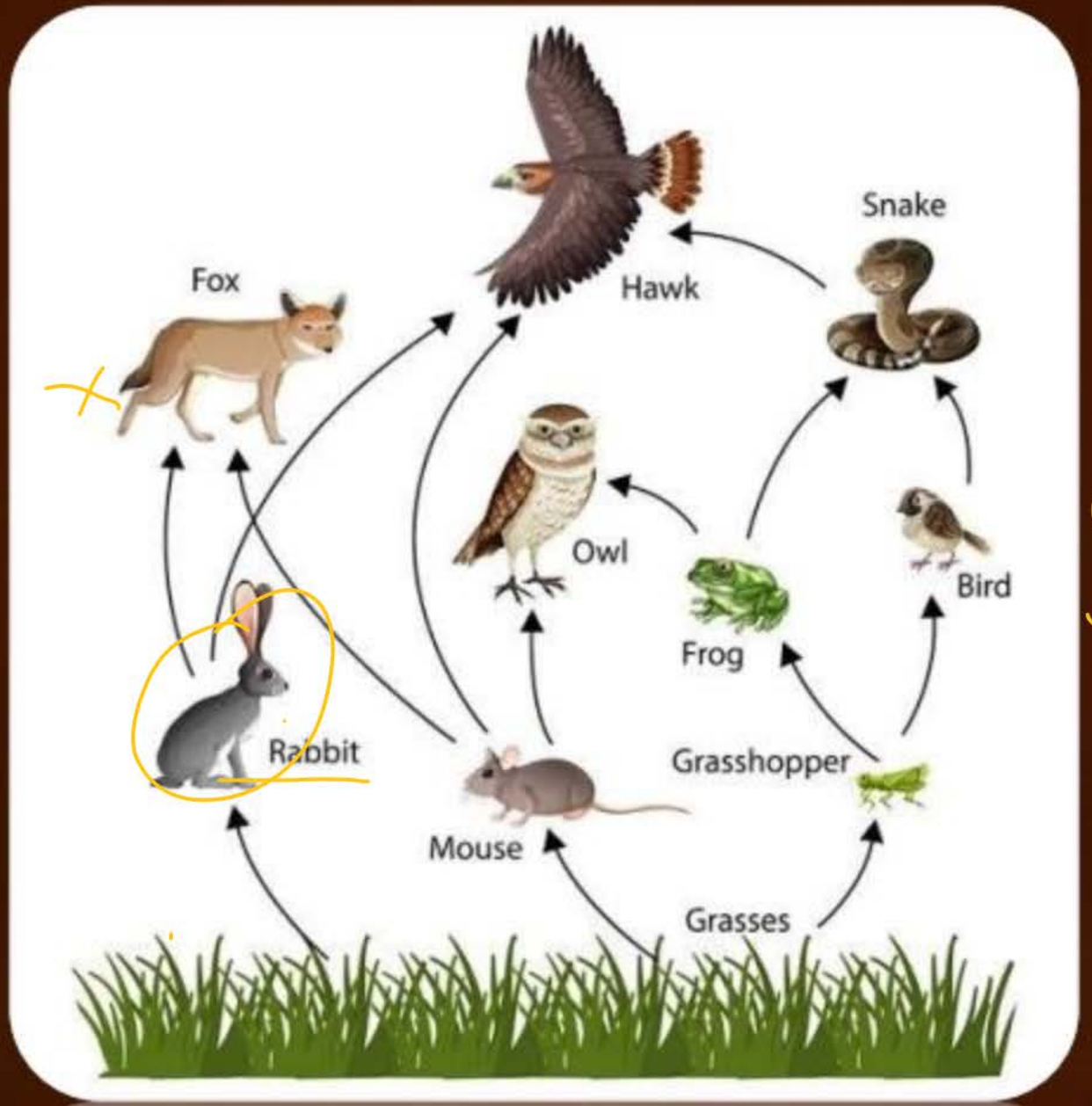
Each of these species and organisms work together in ecosystems, like an intricate web, to maintain balance and support life.

Megadiversity

About 10 million species



12 Countries


Snake
Fox
Hawk
Owl
Bird
Frog
Rabbit
Grasshopper
Mouse
Grasses

Food
kleb

Classification

Aristotle's system

Aristotle's System

Plants

Animals

Reject.

Soft stems (herbs)

one woody stem (trees)

several woody stems (shrubs)

Air dwellers

Water Dwellers

Land Dwellers

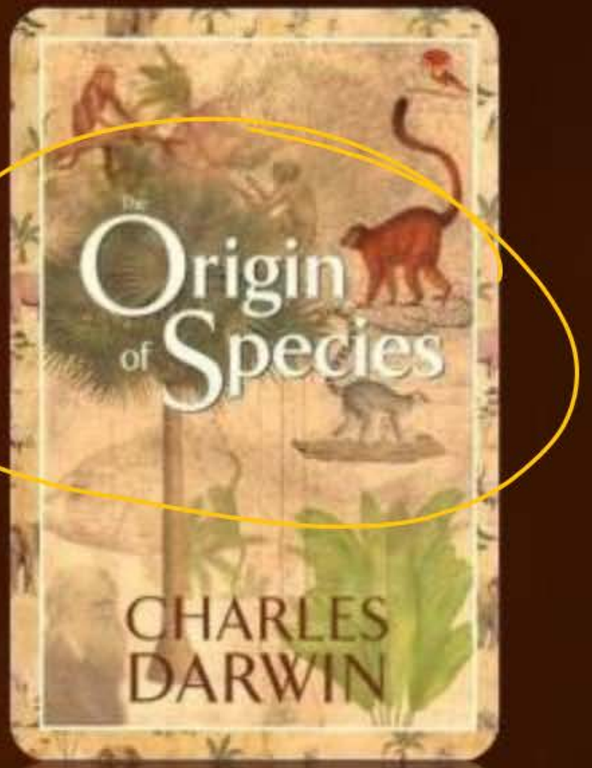
PLANTS:
Based on size of stem

ANIMALS:
Based on where they lived

Classification and evolution

Charles Darwin

- Evolution is change in the heritable characteristics of biological populations over successive generations
- Charles Darwin first described this idea of evolution in 1859 in his book , The origin of species.
- Natural selection
- Survival of the fittest



- Primitive or lower organisms

- Advanced or higher organisms

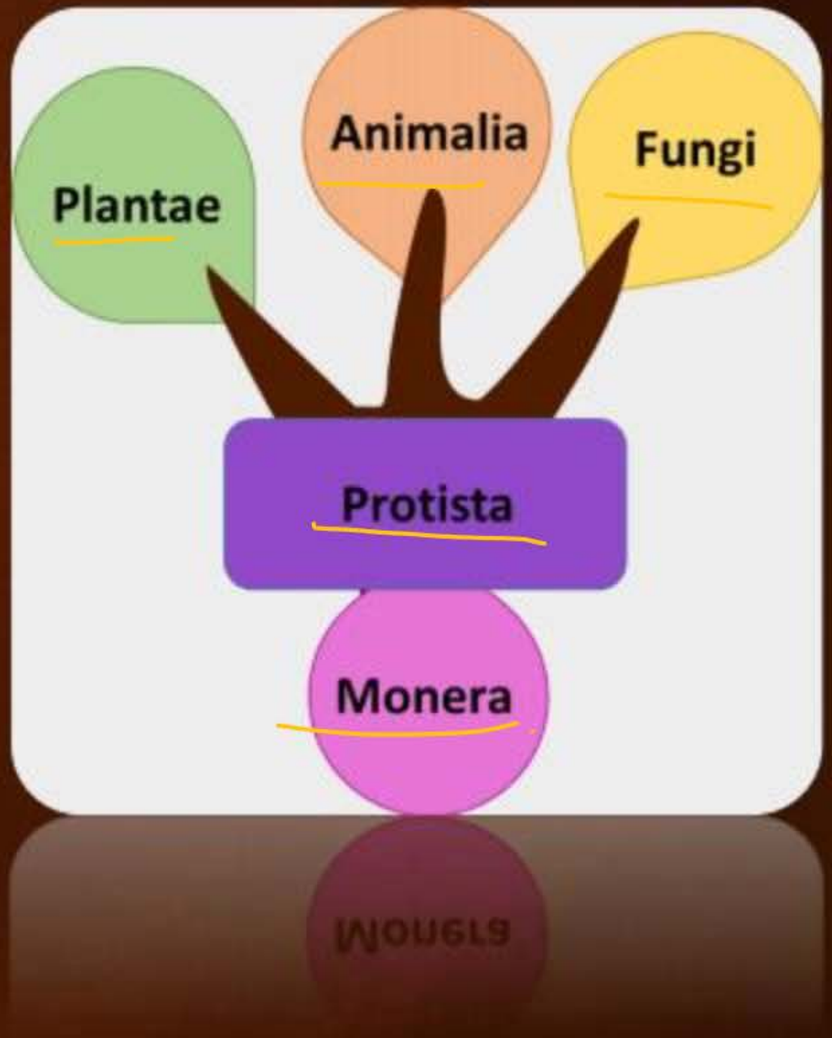
Hierarchy of Classification

- Ernst Haeckel (1894)
- Robert Whittaker (1959)
- Carl Worse (1977)

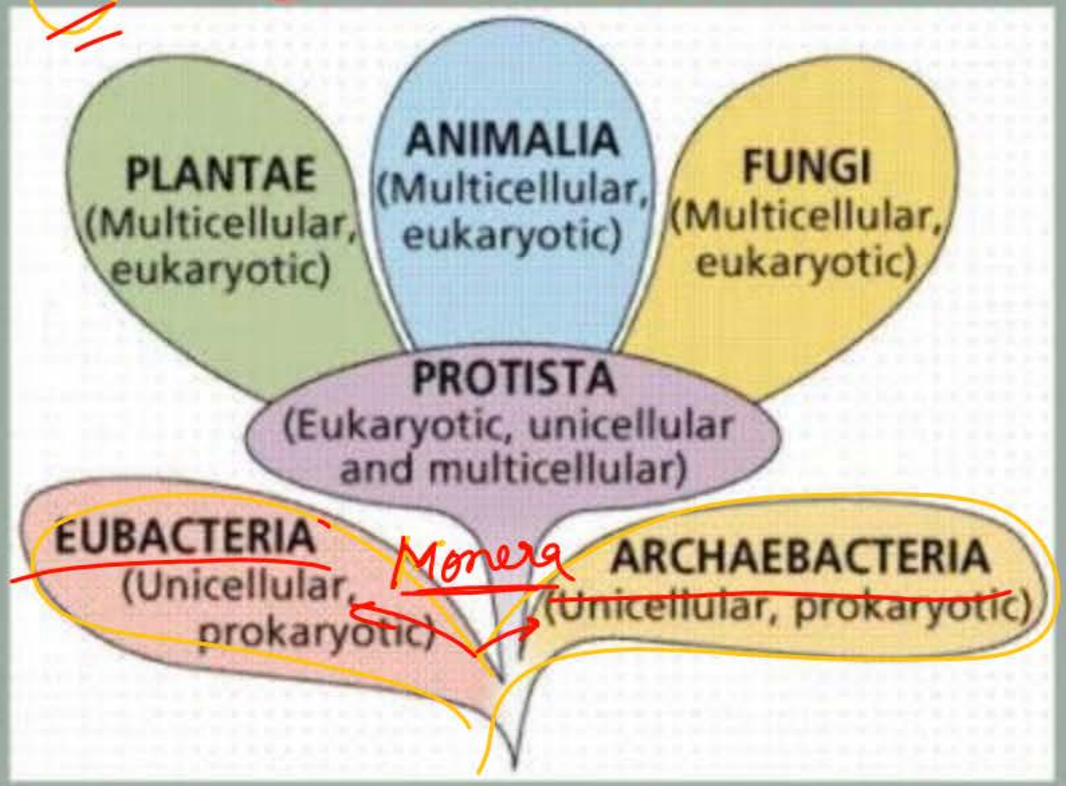
5 kingdom classification by Whittaker

- On the basis of –
- Cell structure
- Mode and source of nutrition
- Body organisation

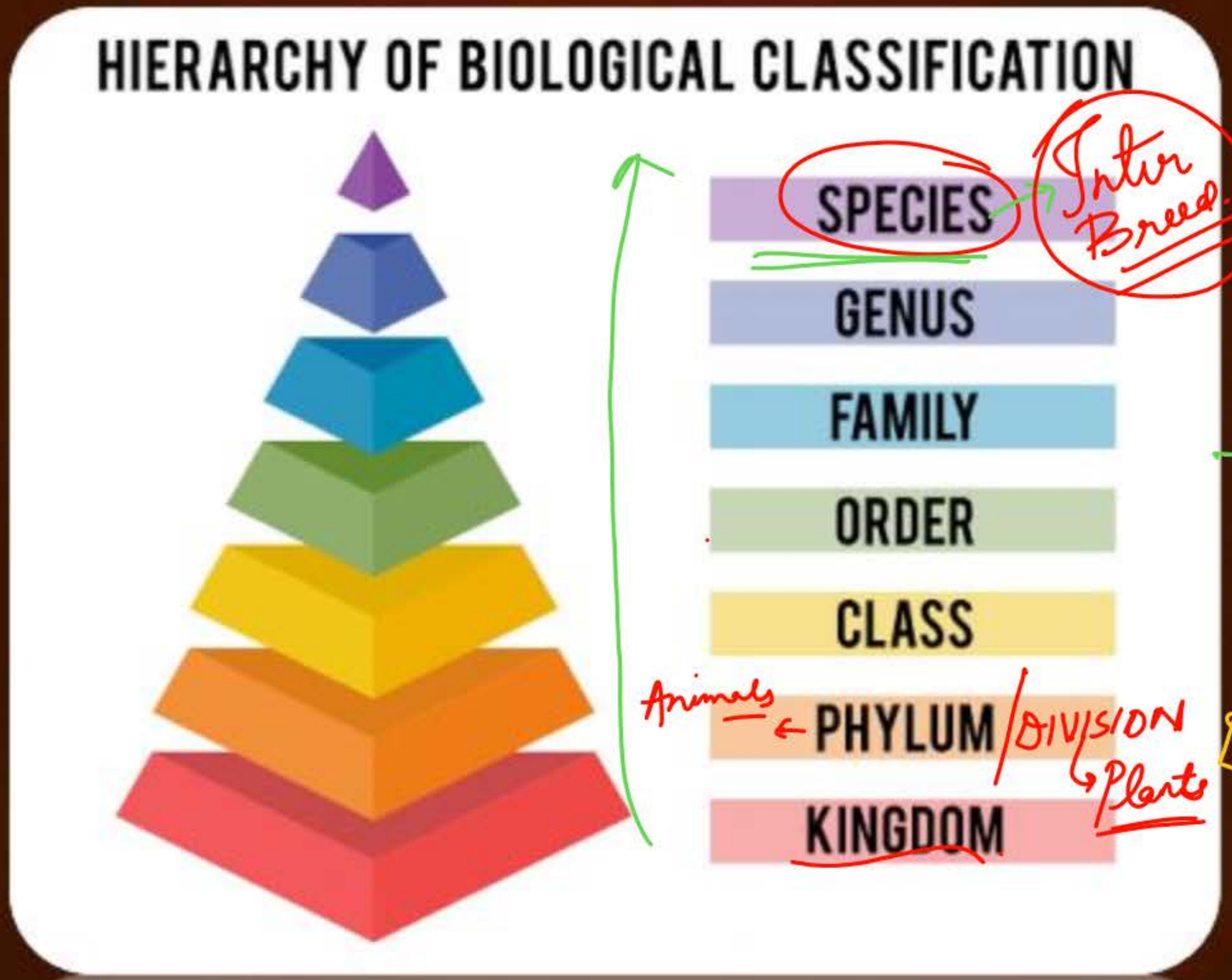
Heterotrophic
Autotrophic



6 kingdom classification



Heirarchy


HIERARCHY OF BIOLOGICAL CLASSIFICATION
SPECIES
GENUS
FAMILY
ORDER
CLASS
PHYLUM/DIVISION
KINGDOM
Inter Breed
Animals
Plants
PCO FinGuS
DP

Taxonomy

- A beach of science that deals with:
- Identification
- Nomenclature
- Classification of organisms

- Father of taxonomy – Carolus Linnaeus
- Gave the binomial System of nomenclature

Binomial Nomenclature

Genus Species

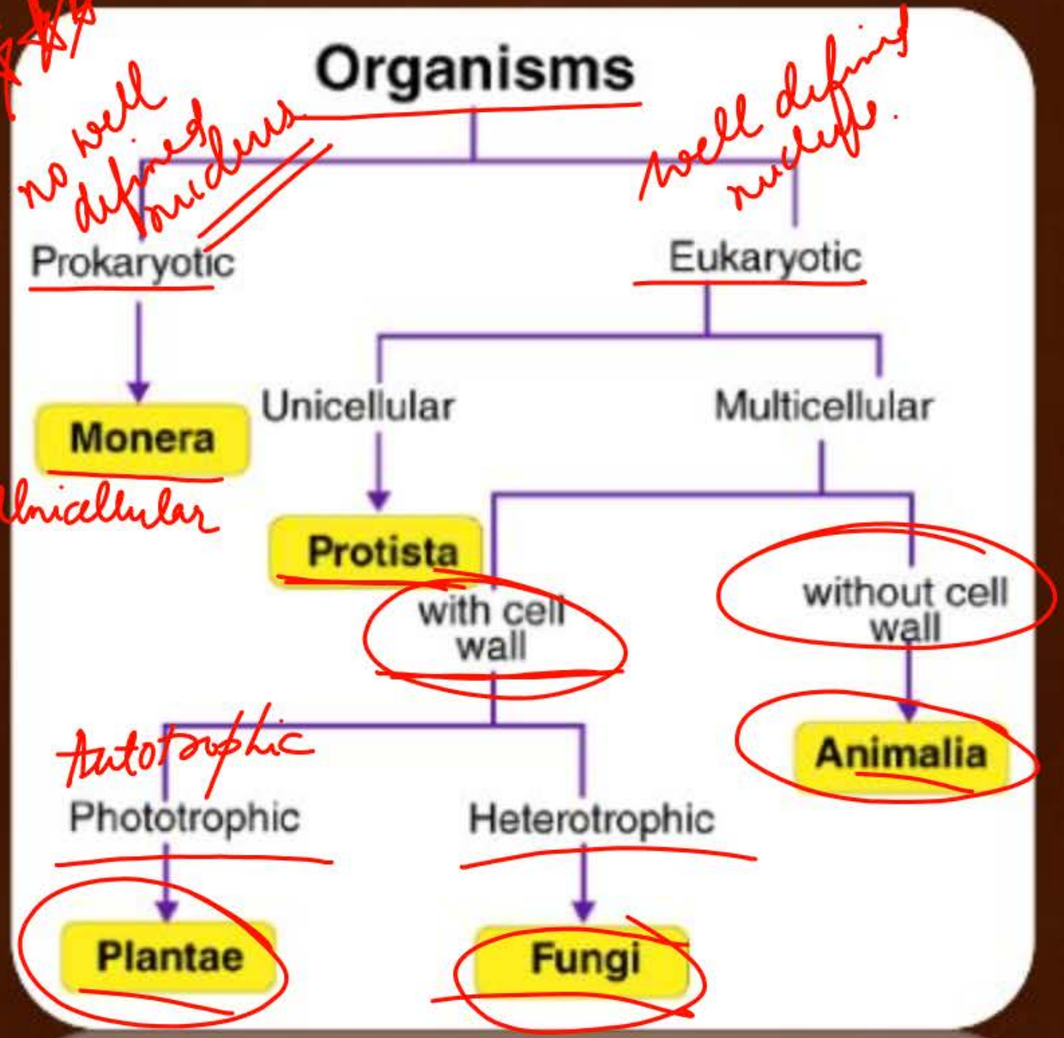
Mangifera Indica

Gupta Soumya

Homo sapiens

Genus Species

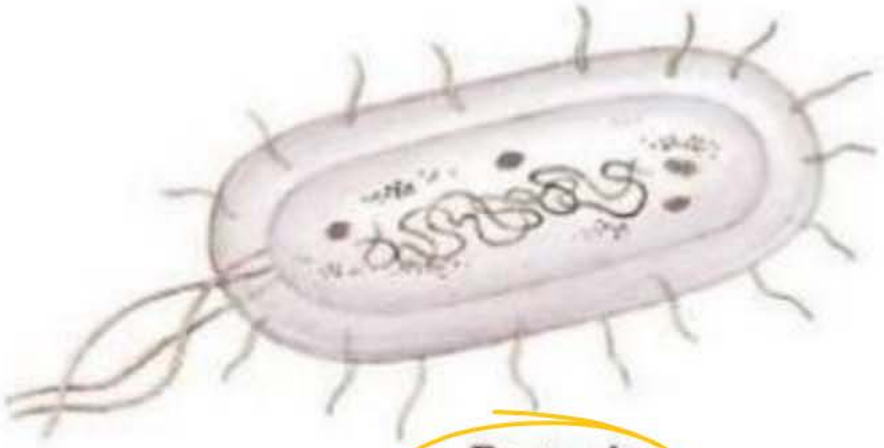
The 5 kingdom Classification – Concept Map



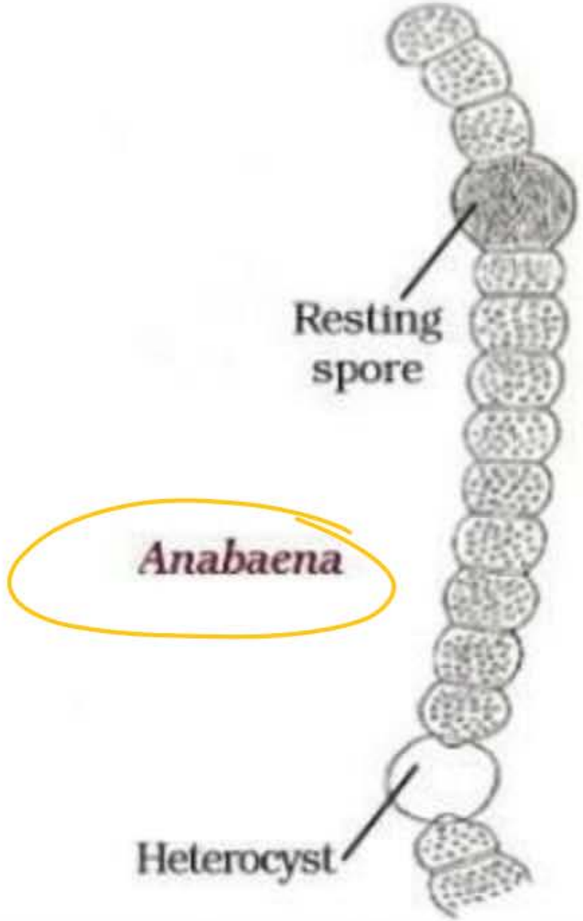
Monera

- No well defined nucleus or organelles
- Unicellular
- Might have cell wall and some might not
- Might be heterotrophic or autotrophic
- Cyanobacteria, mycoplasma, bacteria , anabaena

Blue green Algae.



Bacteria



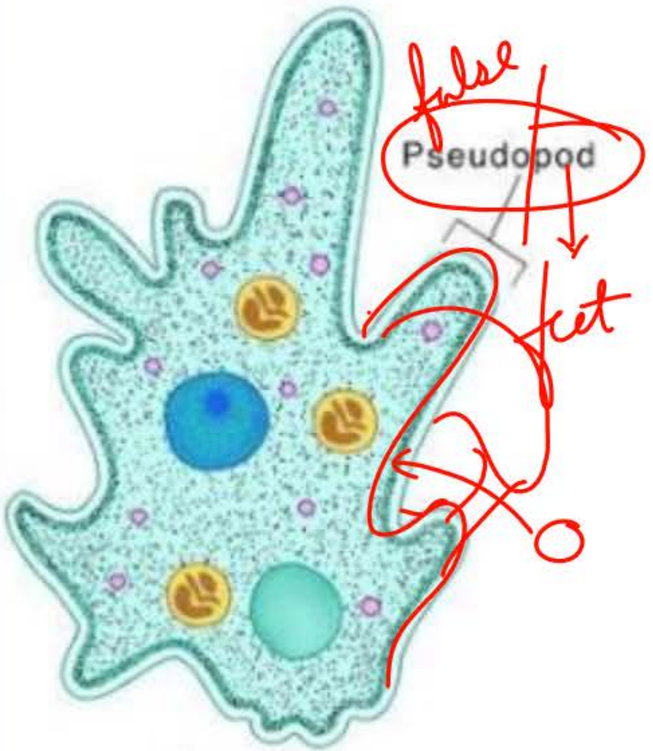
Anabaena

Monera Kingdom

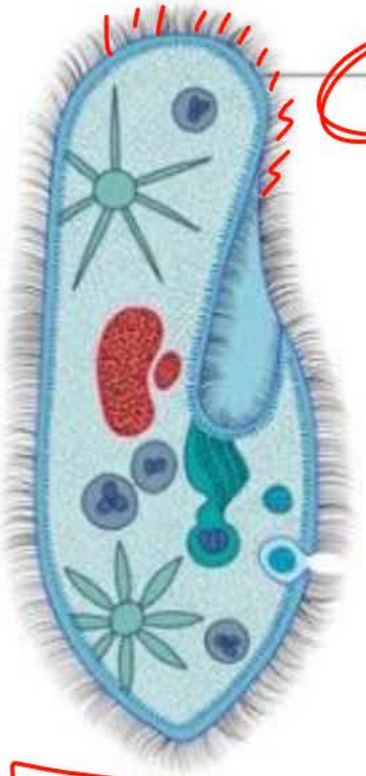
Protista

- Unicellular eukaryotic
- Autotrophic or Heterotrophic

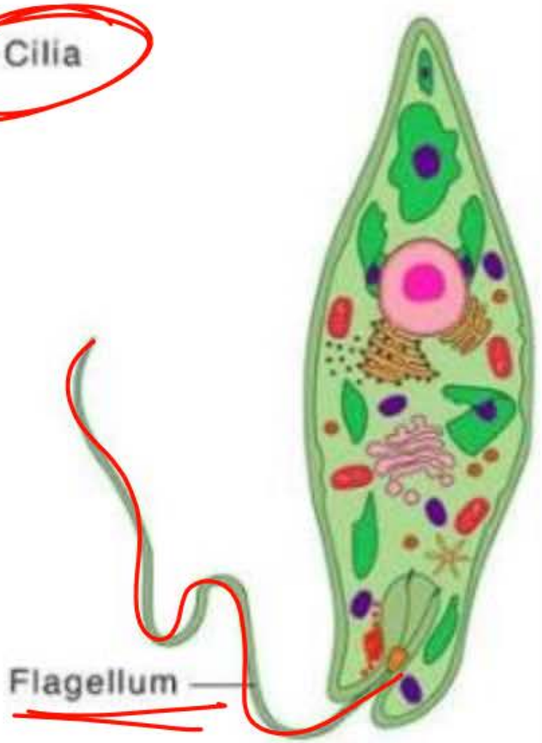
Locomotion in Protists



1 Amoeba



2 Paramecium



3 Euglena

Fungi

- Eukaryotic
- Multicellular
- With cell wall – Chitin
- Heterotrophic
- Saprophytes
- Lichens – Symbiotic relationship with blue green algae
- Aspergillus, penicillin, agaricus

Plants → cellulose

Bacteria → Peptidoglycans

* feeding of dead & decaying organic matter.

**

Pollution indicators LICHENS

Plantae

- Eukaryotic
- Multicellular
- Cell wall – Cellulose
- Autotrophic
- Chlorophyll for photosynthesis

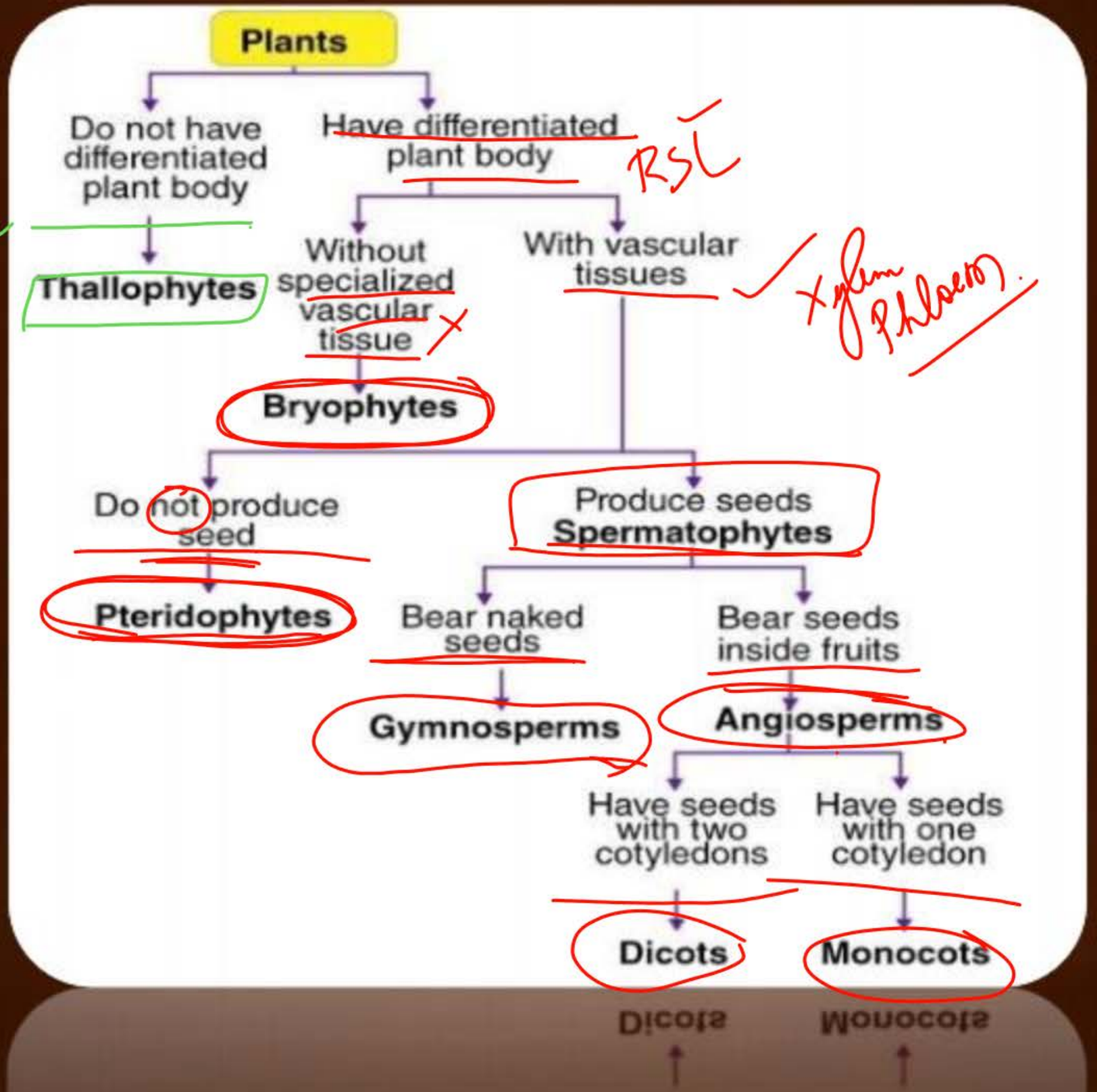
Animalia

- Multicellular
- Eukaryotes
- Without cell wall
- Heterotrophic

Thallus

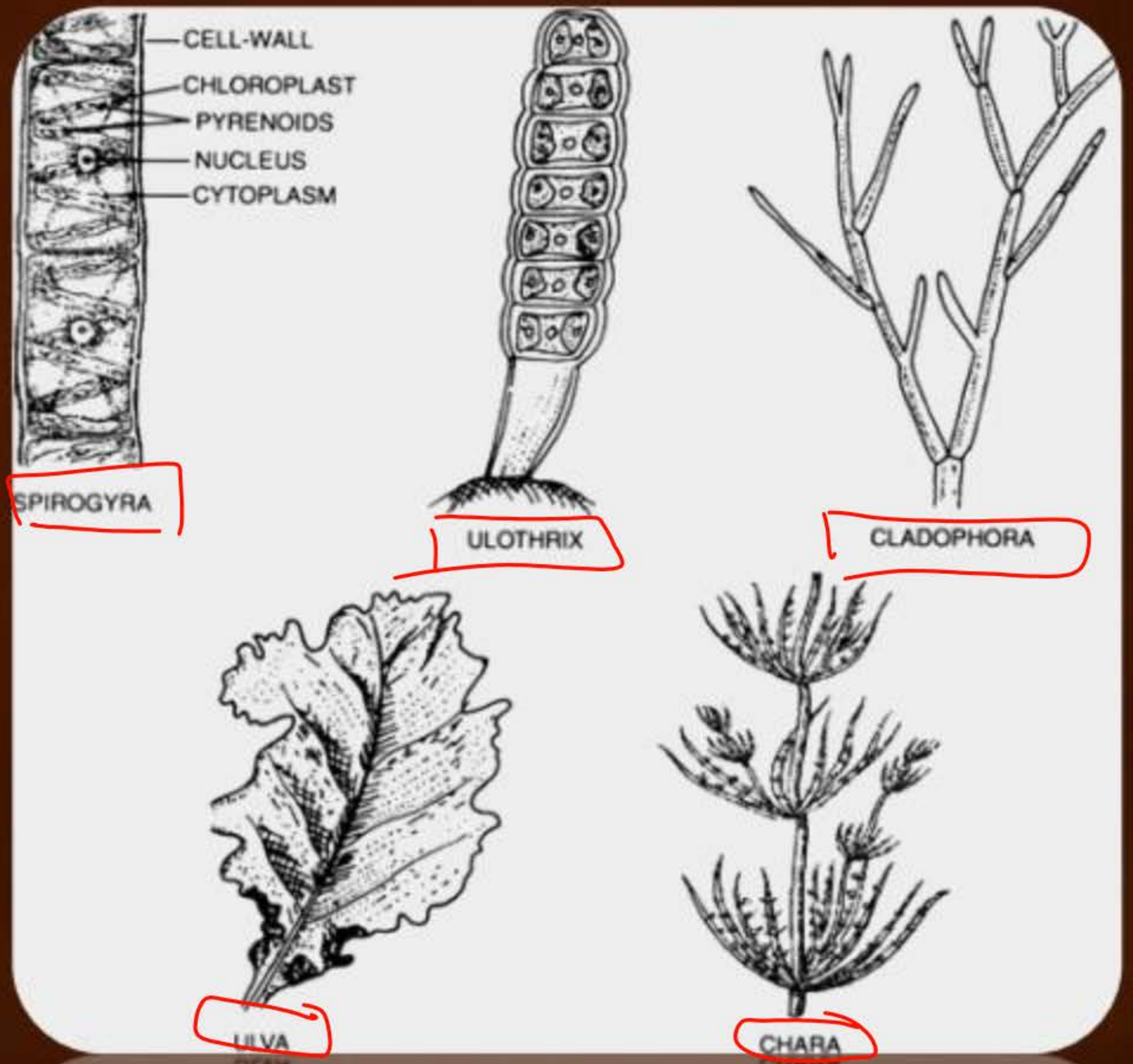
RSL

Concept Map



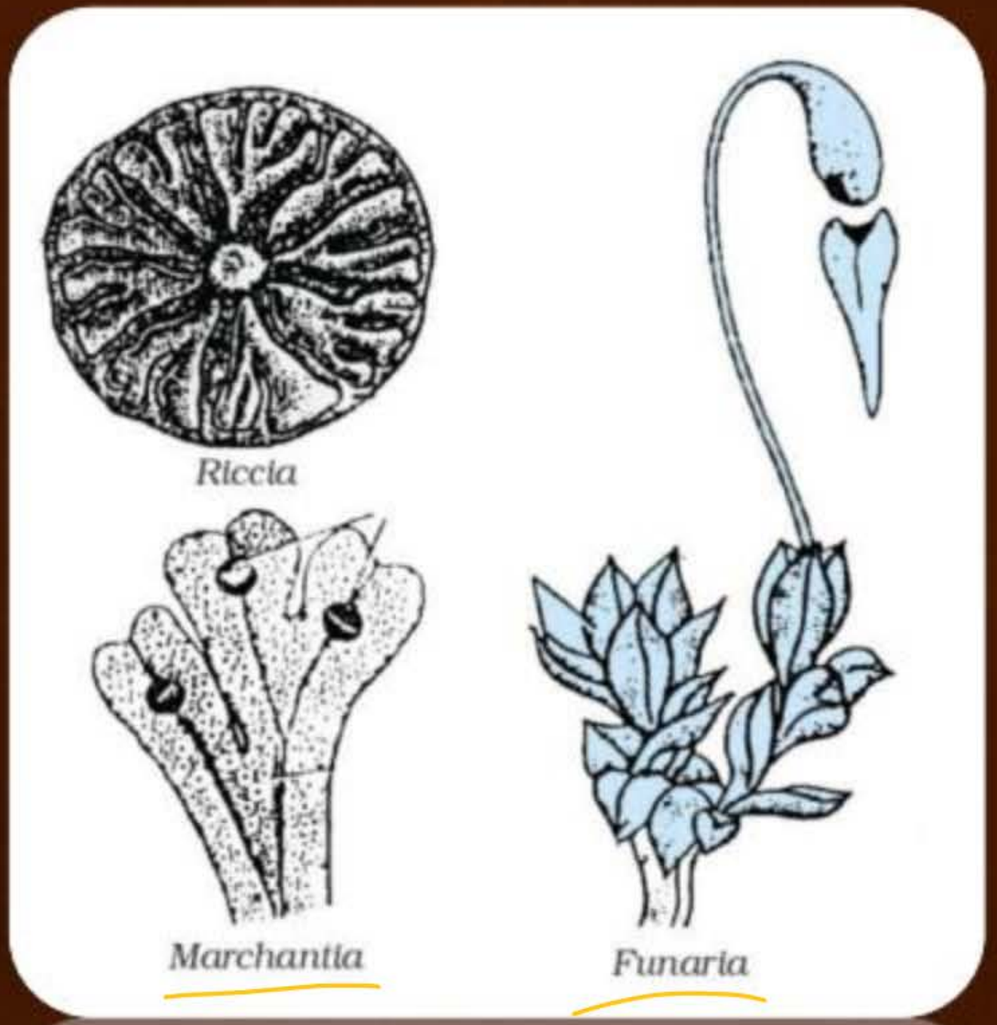
Thallophytes

- No well differentiated body RSL
- Plants in this group are commonly called algae
- Predominantly aquatic


CELL-WALL
CHLOROPLAST
PYRENOIDS
NUCLEUS
CYTOPLASM
SPIROGYRA
ULOTHRIX
CLADOPHORA
ULVA
CHARA

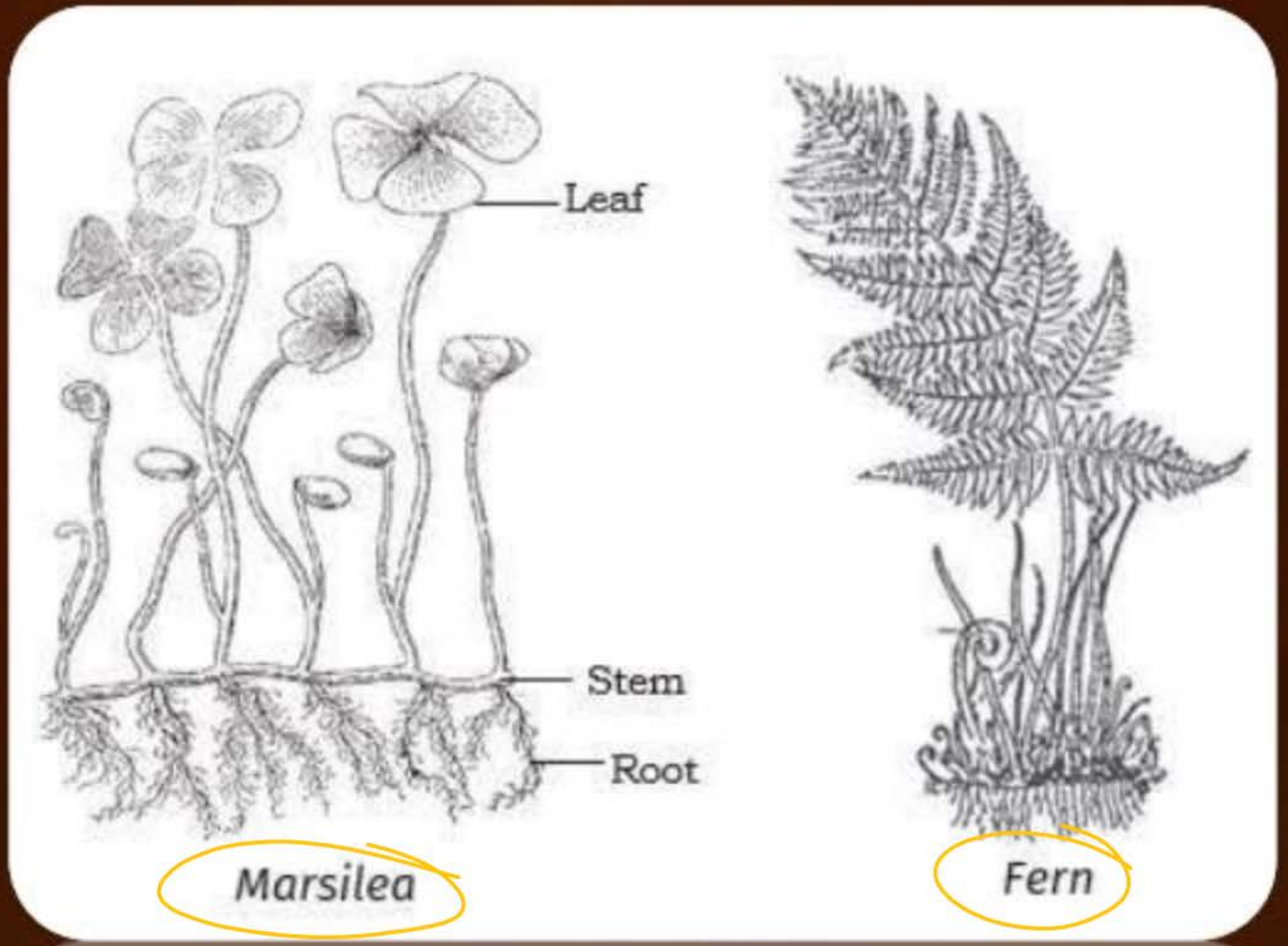
Bryophyta

- These are known as the amphibians of the plant kingdom
- Plant body is commonly differentiated to form stem and leaf like structure.
- No specialised tissue for conduction of water and other substances.


Riccia
Marchantia
Funaria

Pteridophyta

- In this group the plant body is differentiated into roots stems and leaves and has a specialised tissue for conduction of water and other substances from one part of the plant body to other


Leaf
Stem
Root
Marsilea
Fern

- Thallophytes bryophytes and pteridophytes have naked embryos that are called Spores
- the reproductive organs of plants in all these three groups are very inconspicuous and therefore called CRYPTOGAMAE or those with hidden reproductive organs .
- Plants with well differentiated reproductive tissues that ultimately make seeds are called phanerogams.
- Further classified on the basis of whether the seeds are naked or includes in fruits

T
B
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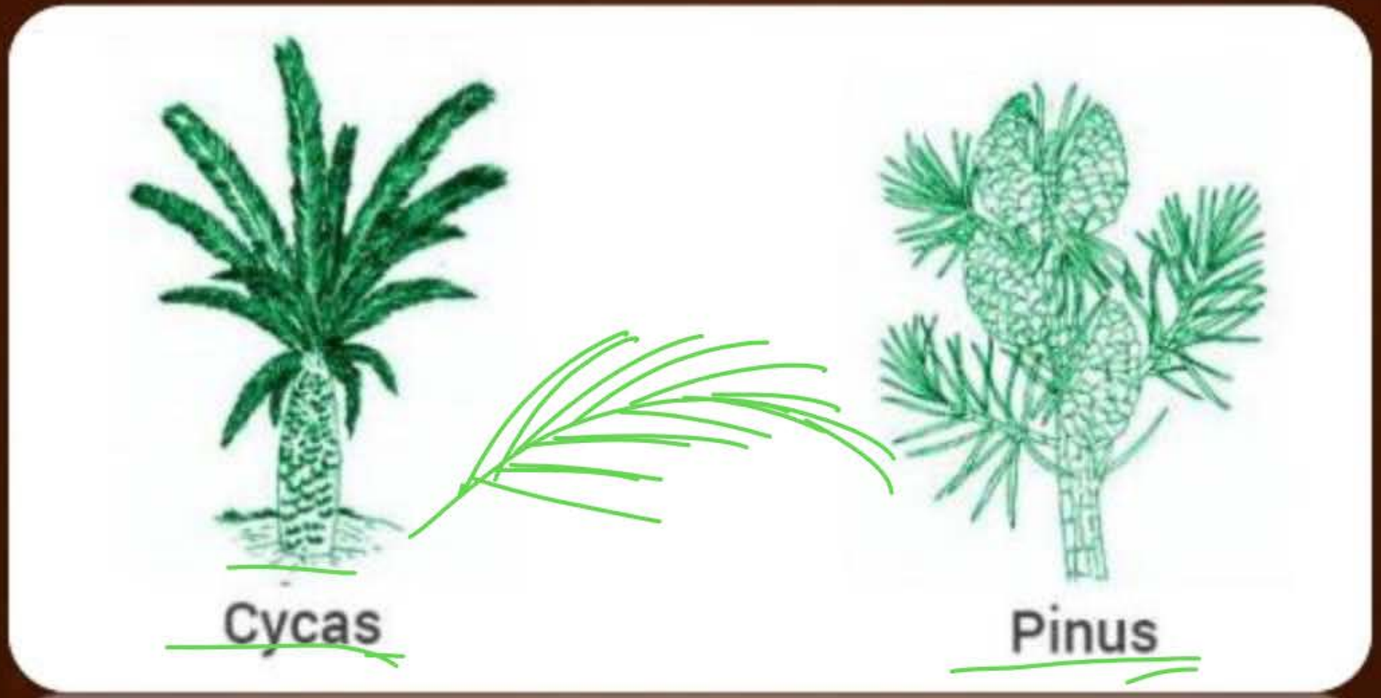
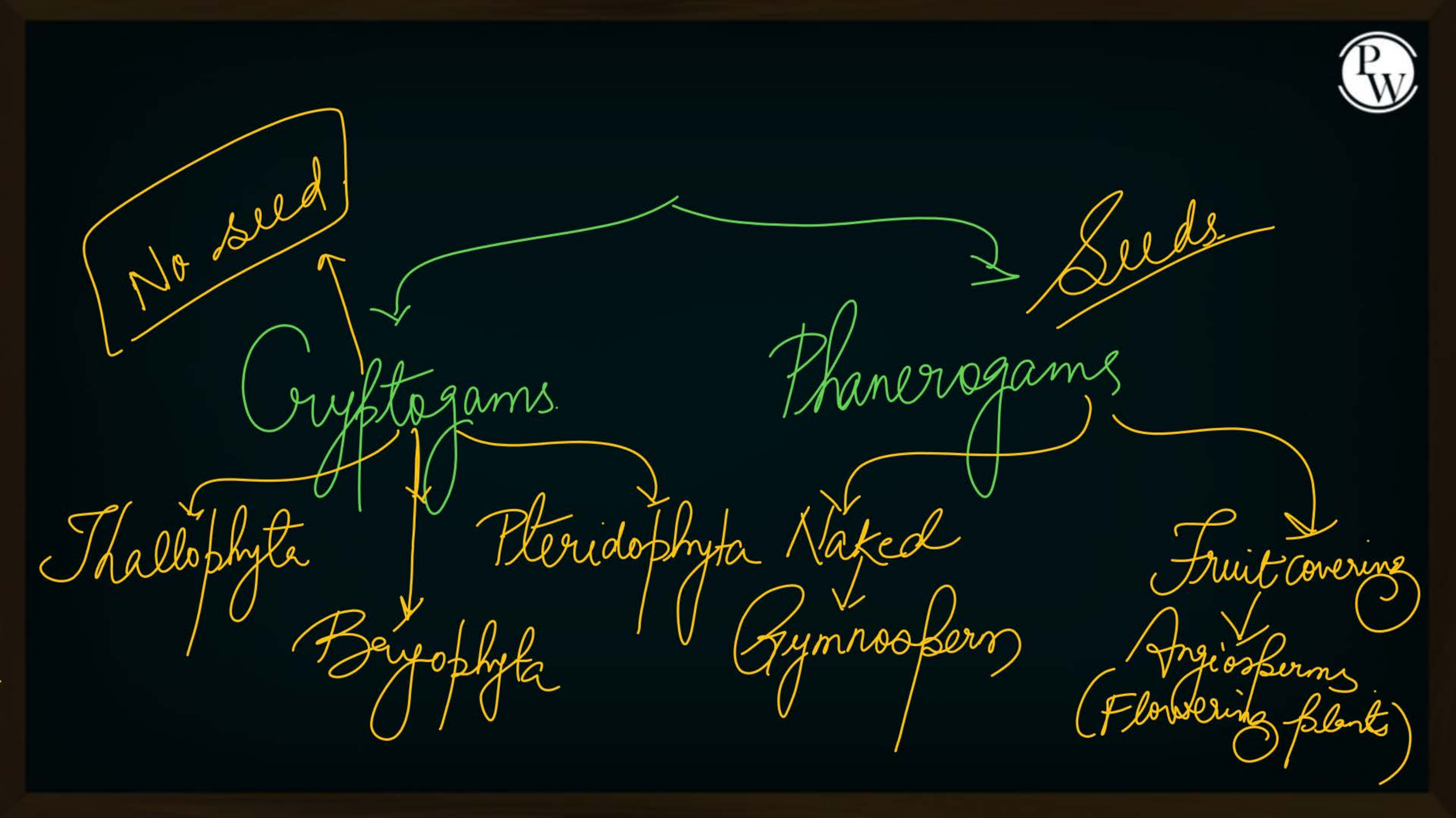
CRYPTOGAMS

Phanerogams.

Gymnosperms

- Naked seeds
- Usually perennial, evergreen and woody.
- Pines, deodar


Cycas
Pinus

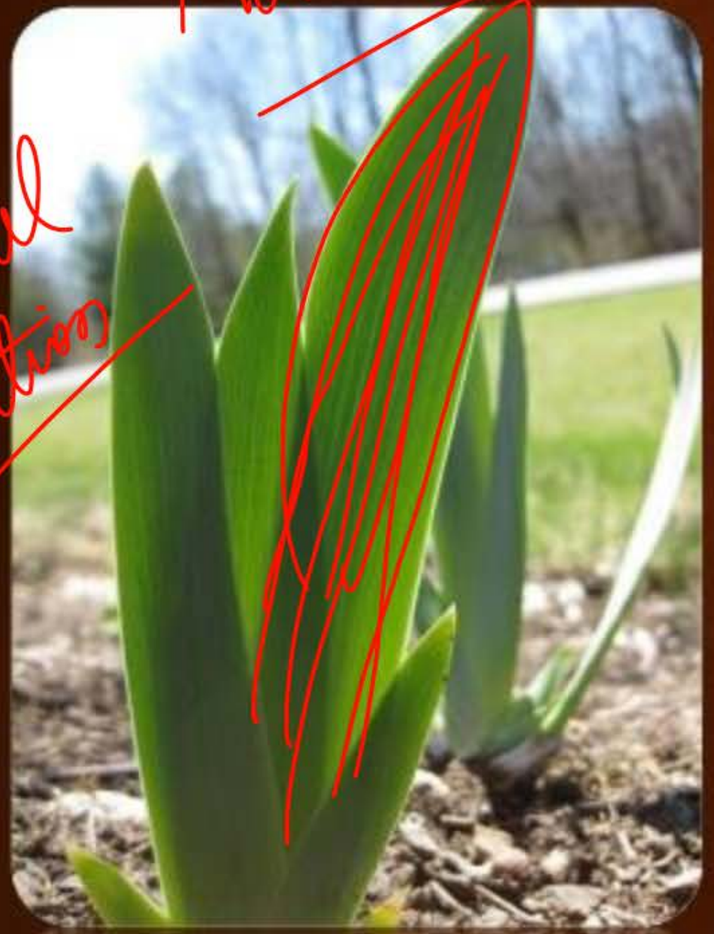

No seed
Seeds
Cryptogams
Phanerogams
Thallophyta
Bryophyta
Pteridophyta
Naked
Gymnosperm
Fruit covering
Angiosperms
(Flowering plants)

Angiosperms

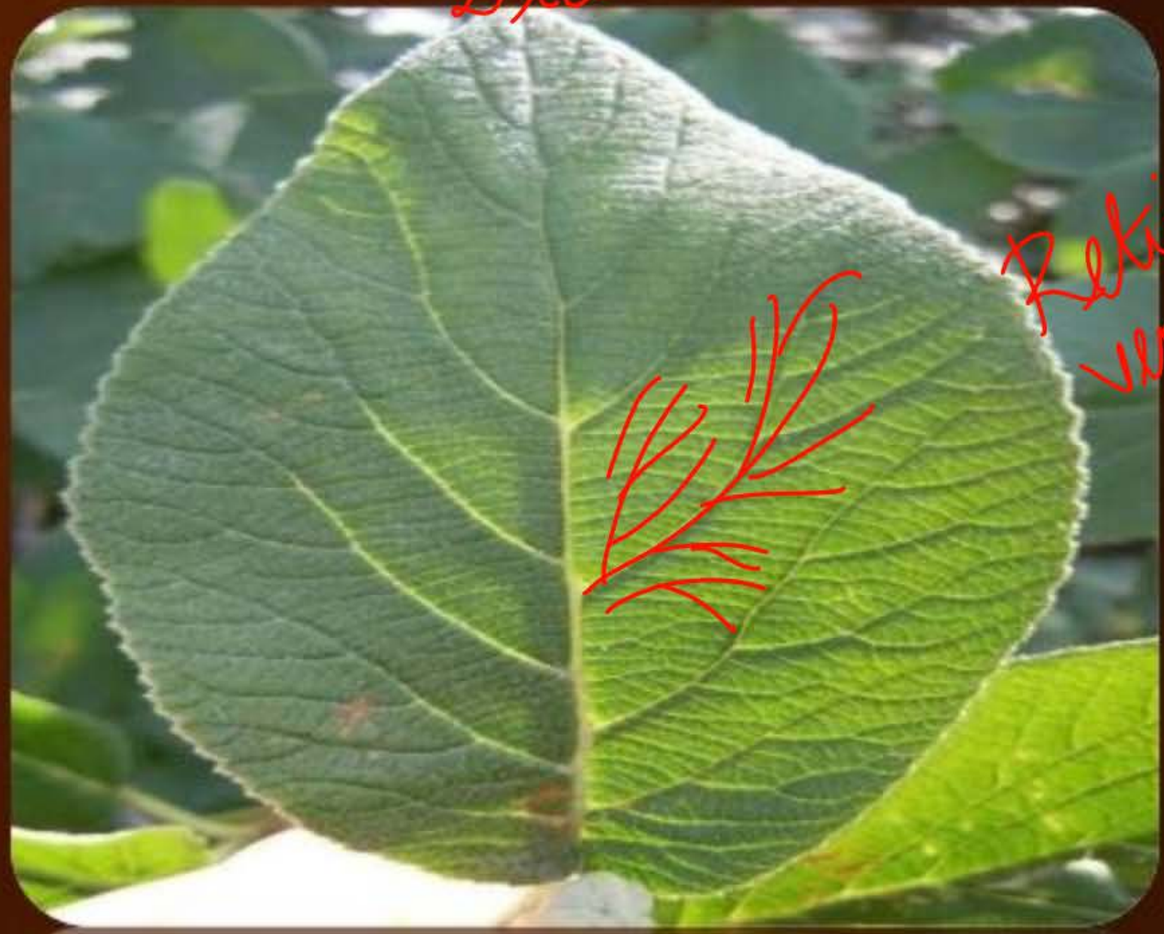
- Covered seeds
- Seeds develop inside an organ which is modified to become a fruit
- Also known as flowering plants
- Plant embryos in seeds have structures known as cotyledons.
- Monocots and dicots
- Parallel and reticulate venation

MONOCOTS

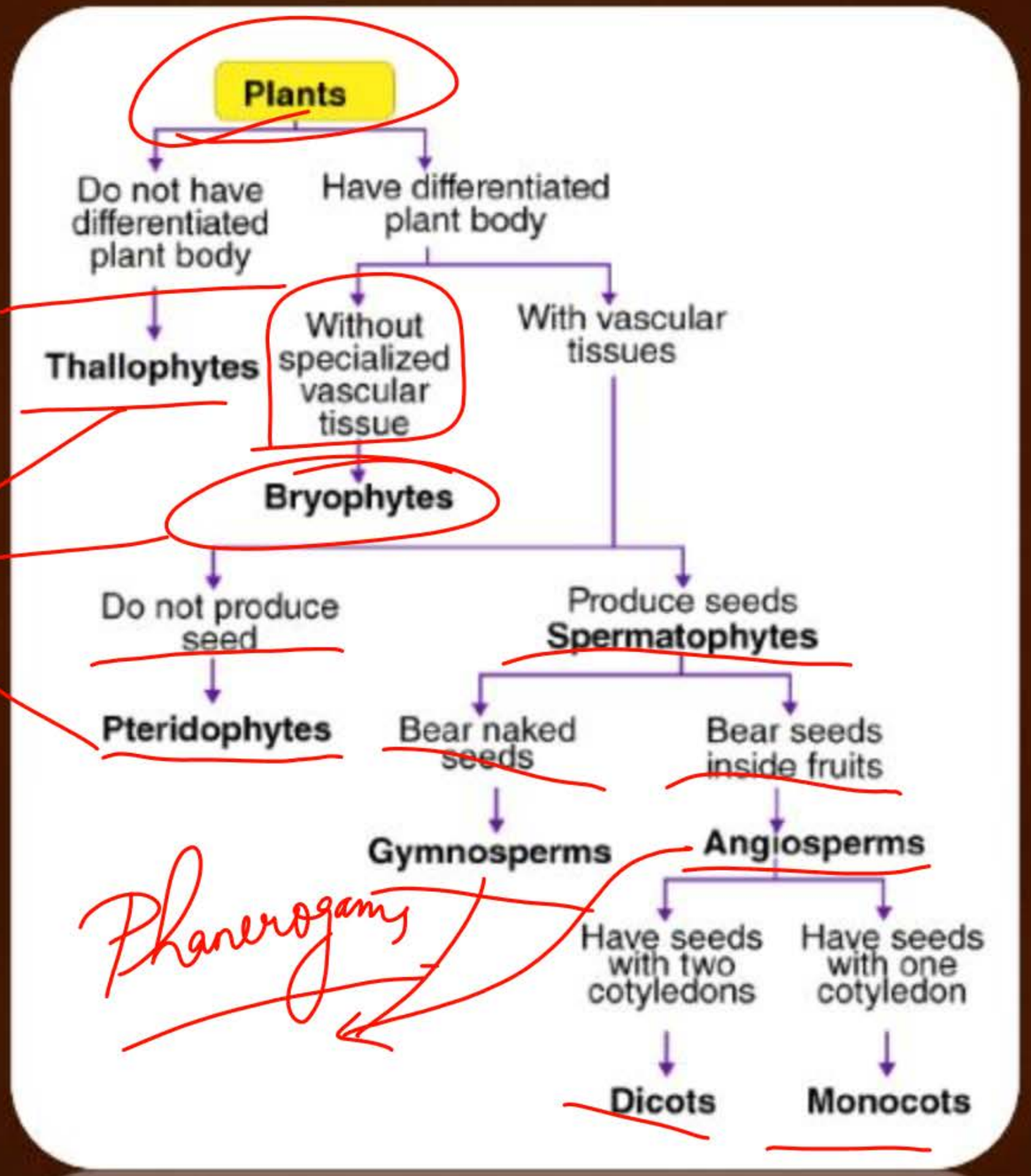
Parallel Venation



Dicots



Reticulate Venation


Plants
Do not have differentiated plant body
Have differentiated plant body
Thallophytes
Without specialized vascular tissue
With vascular tissues
Bryophytes
Do not produce seed
Produce seeds
Spermatophytes
Pteridophytes
Bear naked seeds
Bear seeds inside fruits
Gymnosperms
Angiosperms
Have seeds with two cotyledons
Have seeds with one cotyledon
Dicots
Monocots
Cryptogams
Phanerogams

VANDE MAATRAM