

PLANT KINGDOM

CLASSIFICATION

1. **Artificial**(by Linneaus) - based on vegetative characters
2. **Natural** (by Bentham and Hooker) - external + internal features
3. **Phylogenic** - based on evolutionary relationships

Numerical Taxonomy

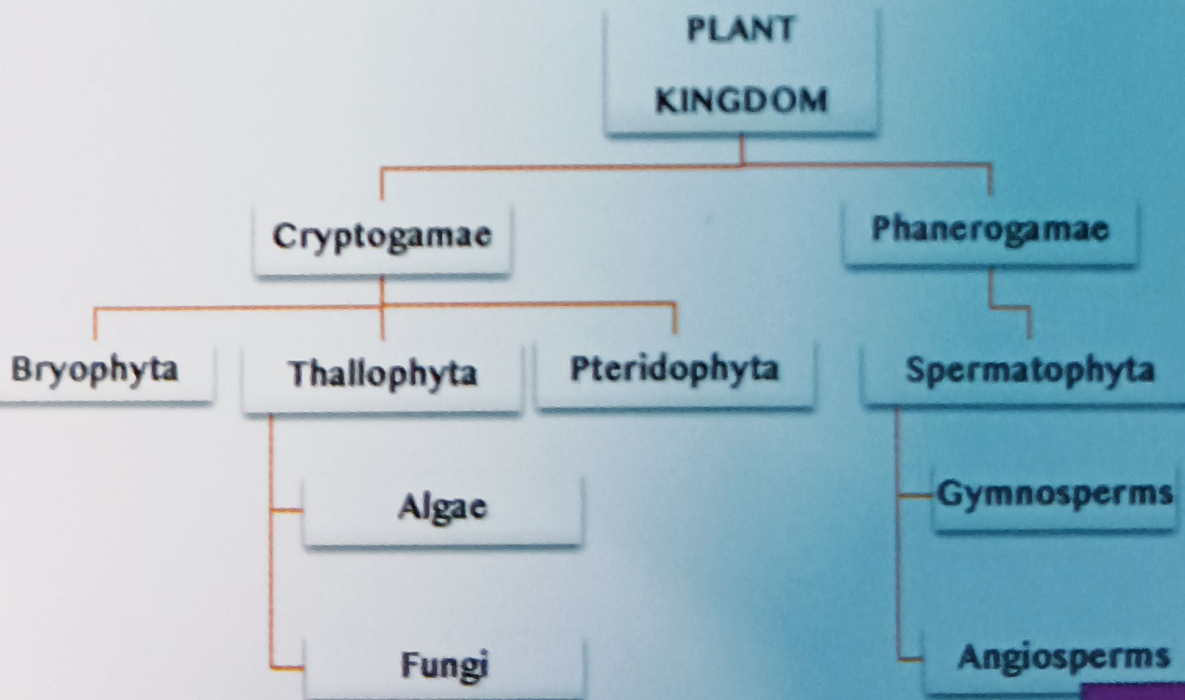
Carried out with the help of computers; assigning codes to each character and processing data.

Cytotaxonomy

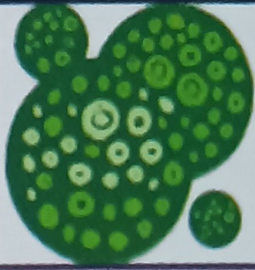
based on cytological information(e.g.- chromosome no.)

Chemotaxonomy

based on chemical constituents



ALGAE



- Chlorophyll(+)
- Simple, thalloid body; aquatic
- Nutrition-autotrophs
- Variable sizes → form colonies e.g.-*Volvox*
↳ filamentous e.g.-*Ulothrix*, *Spirogyra*

Asexual Reproduction

Vegetative

Spore formation

Binary

Fragmentation

Aplanospores

Zoospores



Isogamous
(same size)
e.g.-*Ulothrix*,
Spirogyra

Angiosperms
(dissimilar in size)
e.g.-*Eudorina*

Oogamous
(large ♀; small,
motile ♂)
e.g.-*Volvox*, *Fucus*

Uses of Algae

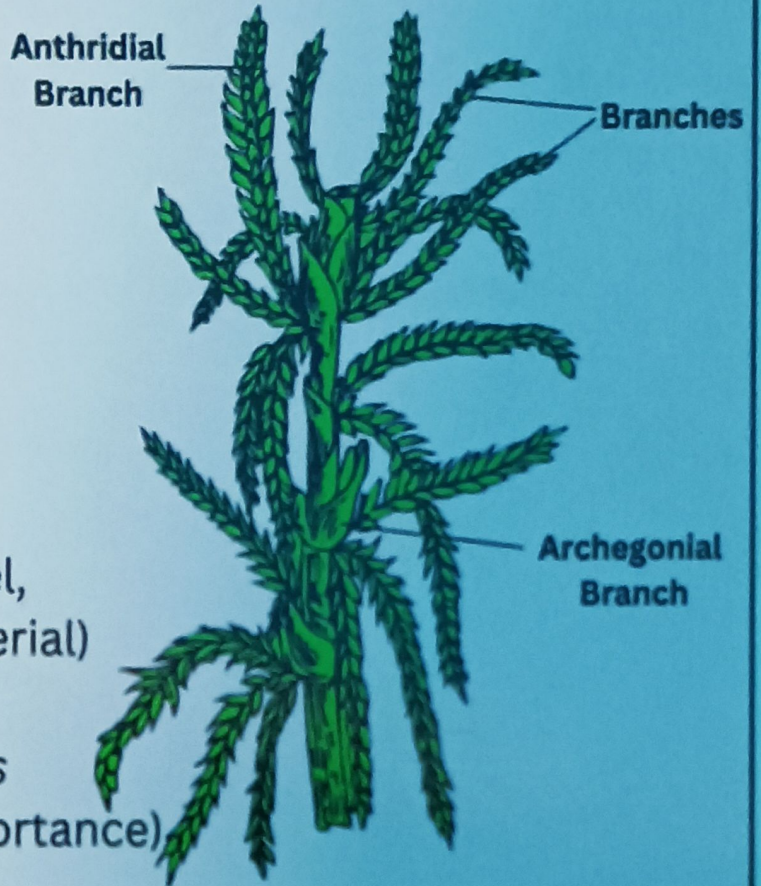
- fixing CO₂
- producers of energy rich compounds
- food e.g.-*Porphyra*, *Laminaria*, *Sargassum*
- produce hydrocolloids e.g.-algin(brown algae)
carrageen(red algae)
- 'agar' obtained from *Geledium* & *Gracilaria*
- protein supplement e.g.-*Chlorella*



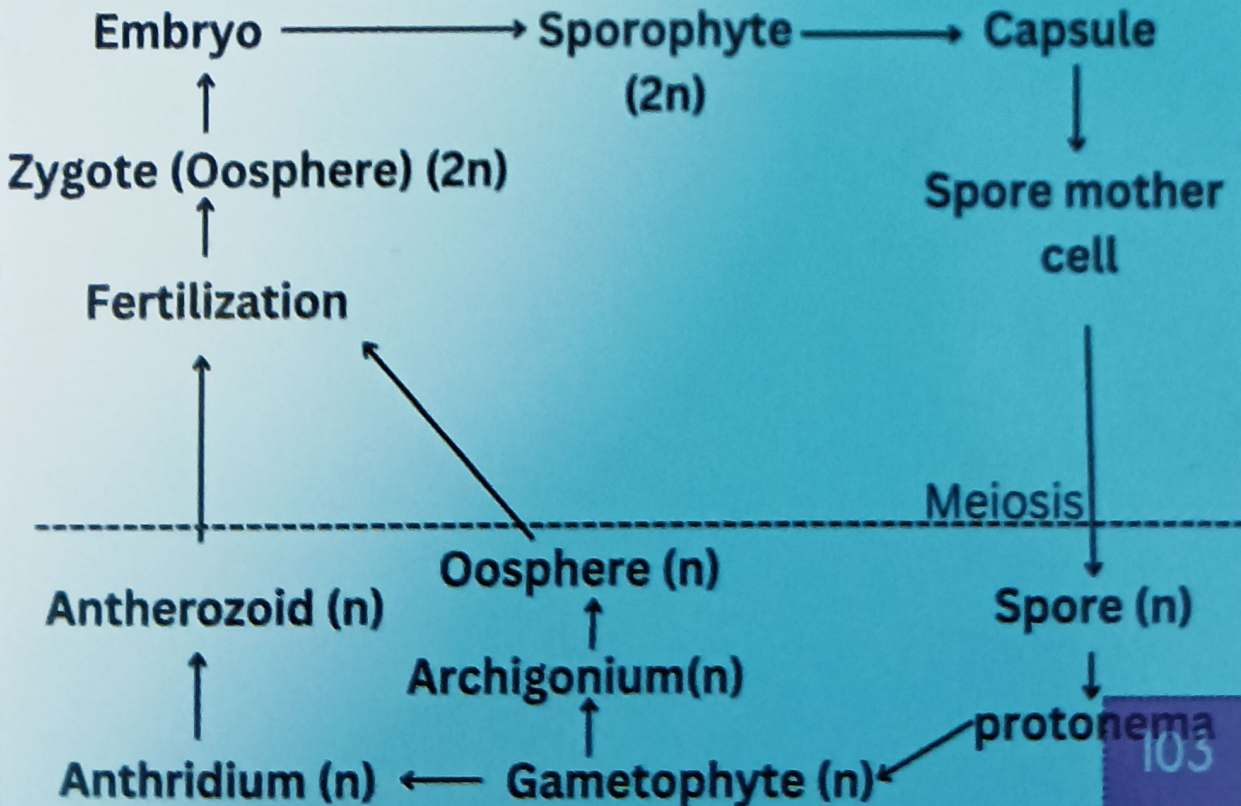
BRYOPHYTES

(Amphibians of Plant Kingdom)

- Depend on water for sexual reproduction
- Plant body-thallus like, erect; root-like, stem-like & leaf like structures (true-absent)
- Uses
 - *Sphagnum* (fuel, packaging material)
 - *Mosses, Lichens* (ecological importance)



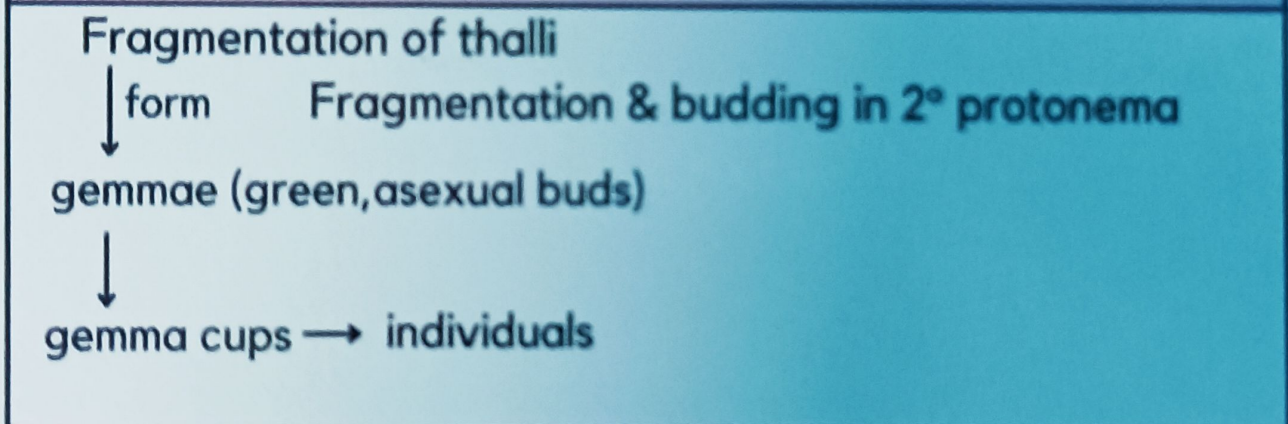
REPRODUCTION



Bryophytes Classification

Liverworts	Mosses
Plant Body <ul style="list-style-type: none"> • Thalloid(dorsiventral) • Leaf membranes have leaf-like structures • Stem-like structures(+) 	Protonema - creepy, green, branched. Leafy stage - Spirally arranged leaves.
Sporophyte - foot, seta, capsule	Sporophyte - foot, seta, capsule.

Asexual Reproduction



Sexual Reproduction

<ul style="list-style-type: none"> • (as shown before in reproduction cycle of Bryophytes) • Eg : <i>Marchantia</i> 	<ul style="list-style-type: none"> • Mechanism remains the same but Sporophyte here is more elaborate and proper mechanism for spore dispersal. • Eg : <i>Funaria</i>, <i>Sphagnum</i>, <i>Polytrichum</i>
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PTERIDOPHYTES

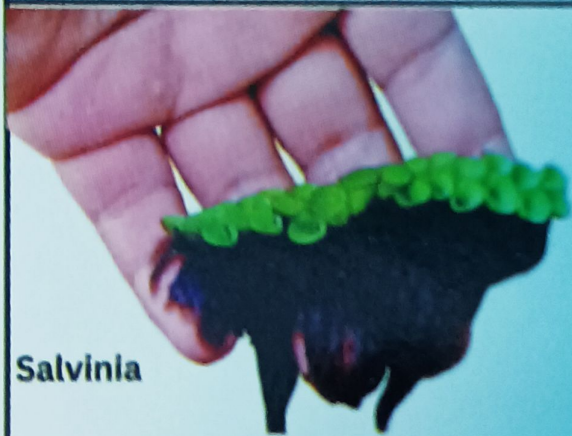
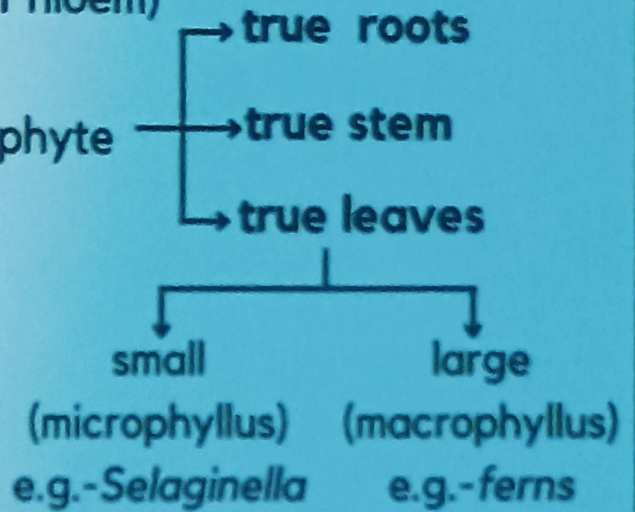
- First terrestrial plants to possess vascular bundles (Xylem & Phloem)
- Seed habit(+)
- Main plant body → Sporophyte
- Sporangia has leaf like appendages

↓
Sporophylls
 forms ↓
 Strobili/cones

e.g.-*Selaginella*, *Equisetum*

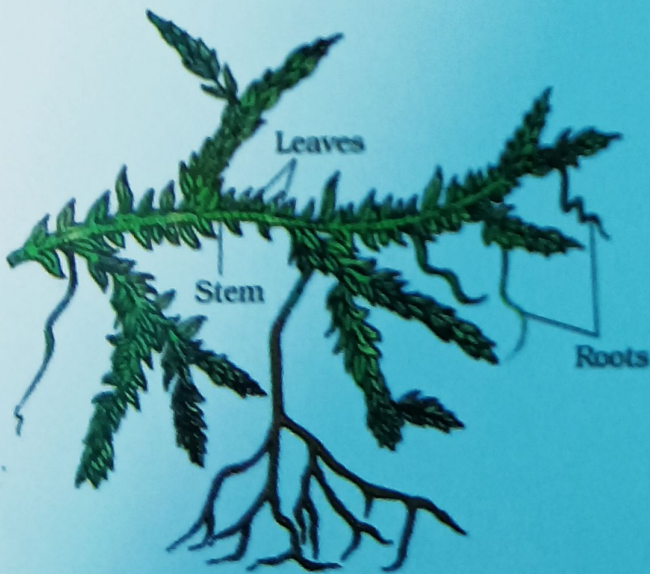
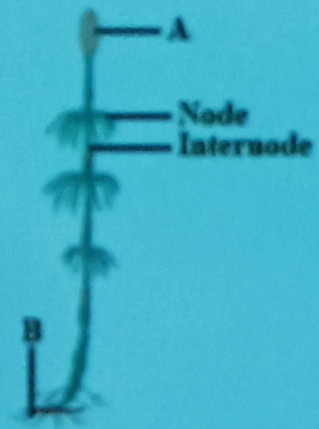
Uses-

- Medicinal, Soil-binders
- Ornaments



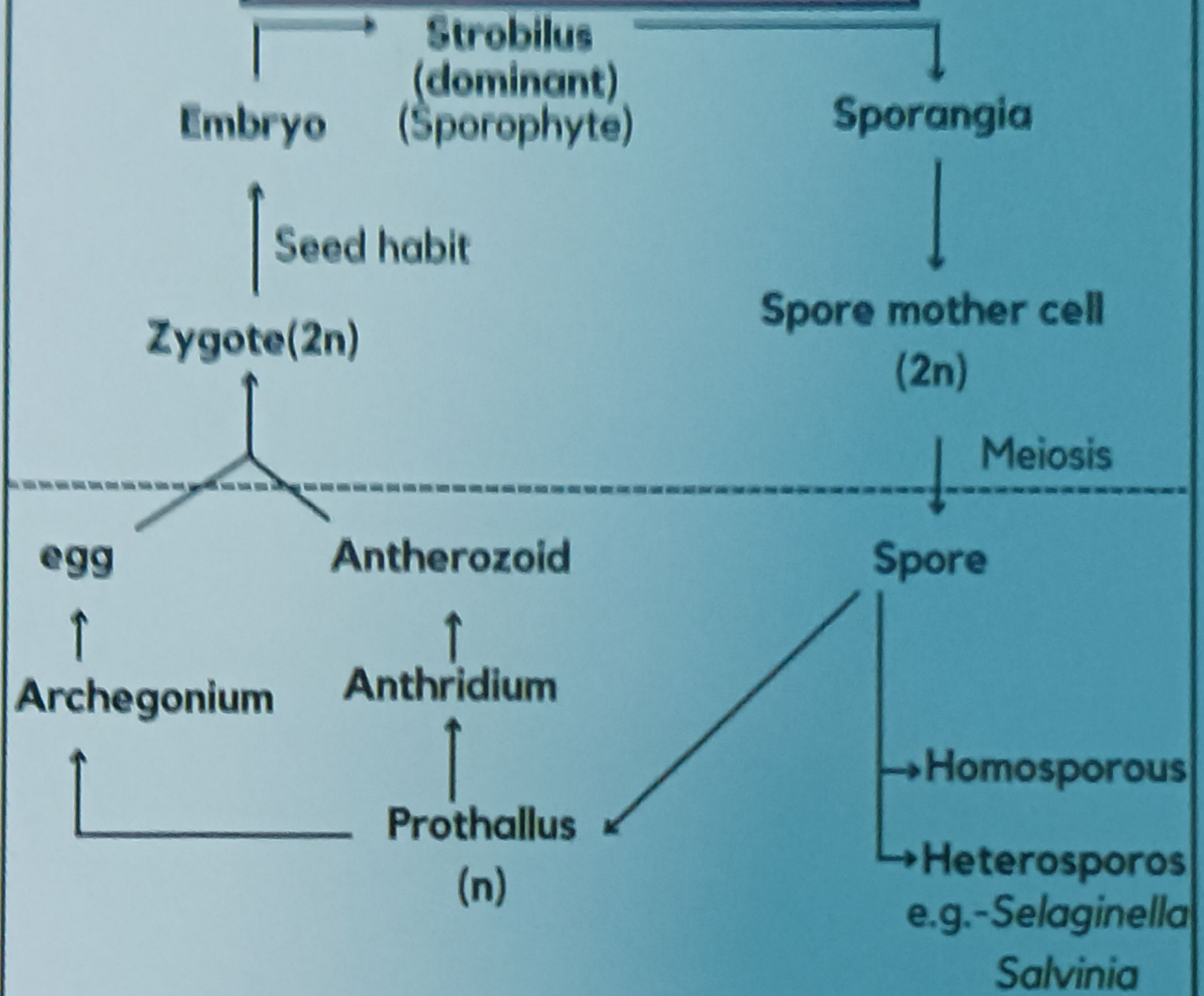
Salvinia

Equisetum



Fern

LIFE CYCLE PTERIDOPHYTES



Pteridophytes Classification

Psilopsida (<i>Psilotum</i>)	Lycopsida (<i>Selaginella</i> , <i>Lycopodium</i>)
Sphenopsida (<i>Equisetum</i>)	Pteropsida (<i>Dryopteris</i> , <i>Pteris</i> , <i>Adiantum</i>)



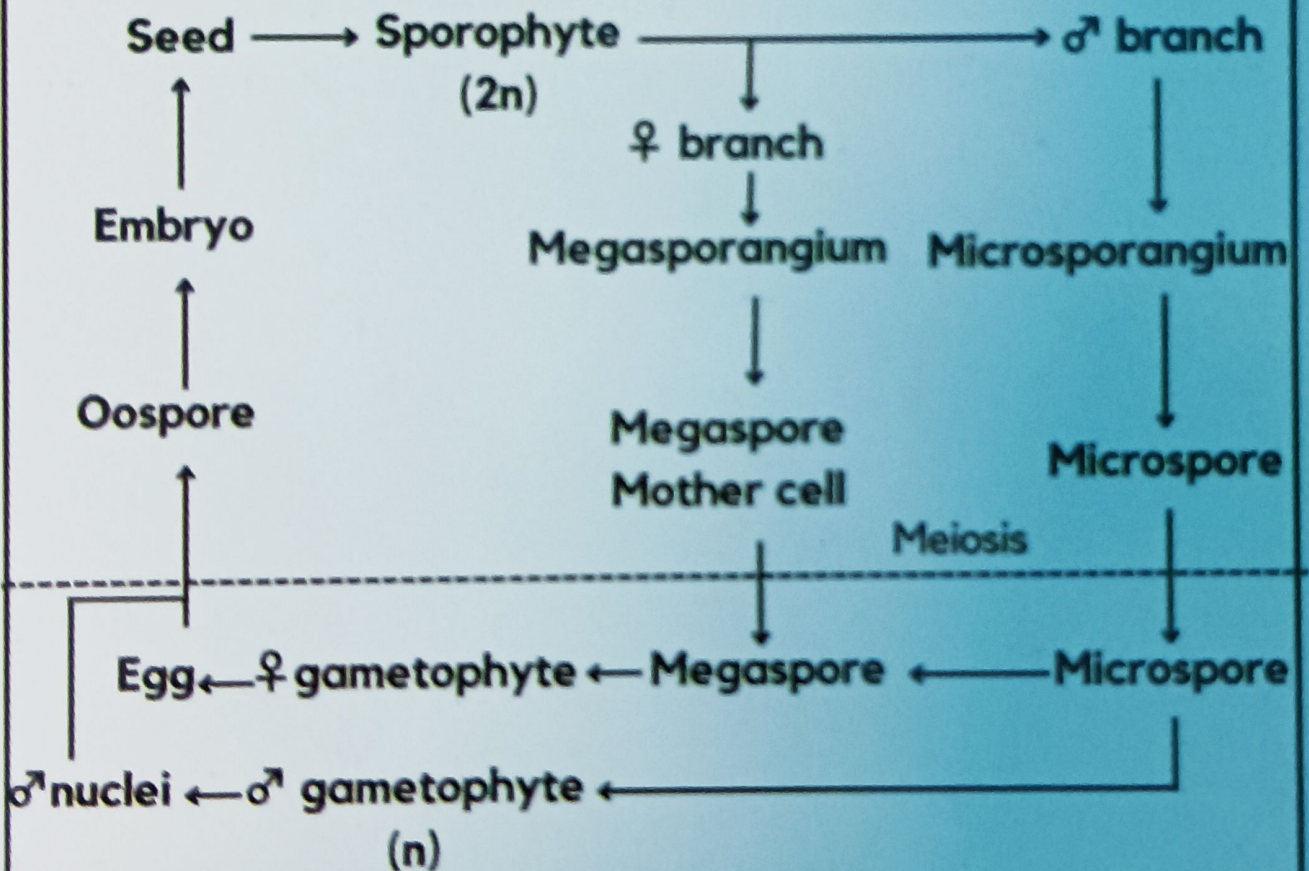
GYMNOSPERMS

(Naked-seeds)

- Ovules remain exposed
- Plant body -
 - Shrubs
 - Trees

- Roots
 - have fungal association → mycorrhiza e.g. - *Pinus*
 - Association with cyanobacteria → Coralloid roots e.g. - *Cycas*
- Leaves - needle like, sunken stomata, cuticle(+)

LIFE CYCLE



- Sporangium are arranged spirally forming cones/strobili
- ♂ gametophyte is called pollen grain
- ♂ & ♀ gametophyte do not exist independently
- Pollens are carried via air current; pollen tube carry ♂ gamete to Archegonia
- e.g. - *Ginkgo*, *Pinus*, *Cycas*, *Sequoia* (tallest)

ANGIOSPERMS

- Double fertilization, embryo sac-7-celled, 8 nucleated
- Ovules develop in specialized structures (Flowers)
- Seeds enclosed in fruit
- Smallest angiosperm-*Wolffia*

Angiosperms Classification

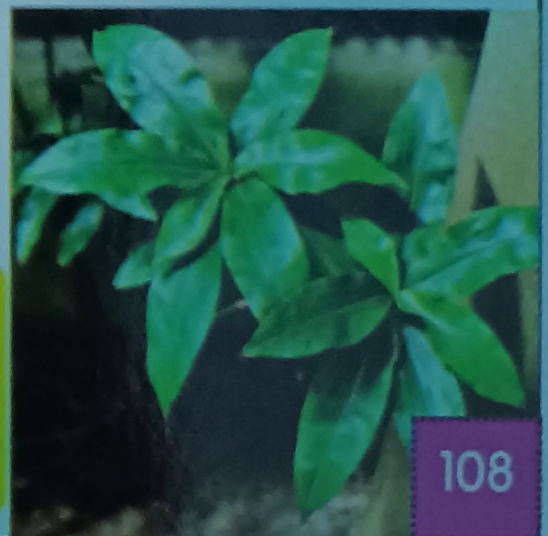
Dicots	Monocots
<ul style="list-style-type: none">• 2 cotyledons in seed• Flowers → pentamerous or tetramerous• Reticulate venation in leaves• Tap roots (majority)• Vascular bundles → arranged (ring)• Cambium(+)	<ul style="list-style-type: none">• One cotyledon in seeds• Flowers → usually trimerous• Parallel venation• Adventitious roots• Vascular bundles → scattered• Cambium(-)

Alteration of Generation

Both haploid & diploid cells divide to form different plant bodies (haploid gametophyte and diploid sporophyte)



Dicots



Monocots