### Systems of Classification

- **Artificial System of Classification** :- Used by Linnaeus, on the basis of vegetative characters.
- **Bentham & Hooker's Natural system of classification**:- based on natural characteristics
- **Phylogenetic System of Classification**:- Based on evolutionary relationship, Include branches like taxonomy, cytotaxonoy & chemotaxonomy.

# 3. PLANT KINGDOM

## ALGAE

### Features

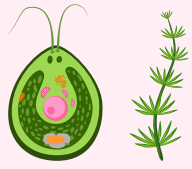
- Chlorophyll – bearing
- Simple & thalloid
- Aquatic (marine + fresh water)

### Reproduction

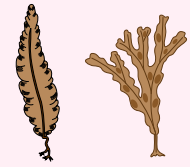
- Reproduction may be vegetative, asexual or sexual.
- Asexual by Zoospores.
- Sexual by isogamy, anisogamy, or oogamy.

### Classes of Algae

**Chlorophyceae**:- Green algae; Chlorophyll a & b; Stored food is starch; cellulosic cell wall; flagella (2-8 equal); fresh water living. Eg:- Ulothrix, Spirogyra.



**Phaeophyceae** :- Brown algae ; chlorophyll a & c with fucoxanthin ; stored food is mannitol & laminarin ; cell wall is of cellulose and algin; fresh water (rare). Eg:- Laminaria, Fucus.



**Rhodophyceae** :- Red algae; chlorophyll a,b & r-phycoerythrin, food is Floridean starch, cell wall is of cellulose, pectin & polysulphate esters; flagella (absent); found in salt water mostly. Eg:- Polysiphonia, Gracilaria.

## BRYOPHYTES

### Types

- **Liverworts** – Riccia & Marchantia. Thalloid Plant body ; gemmae formation
- **Mosses** – Funaria & Sphagnum. Protonema stage ; Sporophyte of mosses more advanced than liverworts.

- Amphibians of plant kingdom.
- Found in humid & damp area.
- Body thallus like & prostrate.
- Body divided into root – like, stem like & leaf – like structures.
- Bryophytes – haploid plant body.

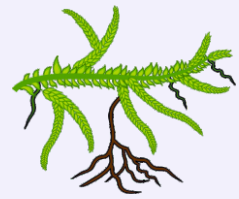
### Sex Organs

- Multicellular sex organs.
- Male Sex organ – Antheridium
- Female sex organ – Archegonium
- Antheridium produces biflagellate antherozoids.
- Archegonium is flask – shaped and produces single egg.
- Sporophyte is free – living.

## PTERIDOPHYTES

### Classes

**Psilopsida** – Psilotum
**Lycopsida** – Selaginella
**Sphenopsida** – Equisetum
**Pteropsida** – Dryopteris



### Features

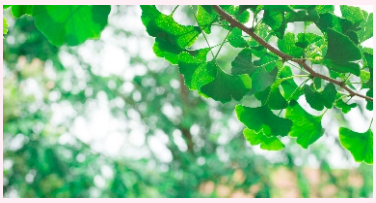
- First terresterial plants to have xylem & phloem.
- Found in shady places.
- Main plant body – sporophyte
- Bear true roots, stem & leaves.
- Leaves – microphylls & macrophylls
- Sporophylls arranged as cones (strobili)
- Thalloid, gametophytes are Prothallus bear (sex organs) Antheridium/ Archegonium

## GYMNOSPERMS

### Features

- Plants with naked seeds
- Ovary wall does not enclose ovules.
- Survive extreme environment
- Produce microspores & megaspores
- Main plant body – Sporophyte
- Male & female gametophyte not independent.
- Fungal association of pinus with mycorhiza is obligatory association for seed germination
- Cycas has specialised roots called corolloid roots associated with cyanobacteria for nitrogen fixation
- Has male & female cones or strobili
- Reduced male gametophyte is called pollen grain
- The female cone bears megasporophylls with megasporangia or ovules

Cycas



Ginkgo

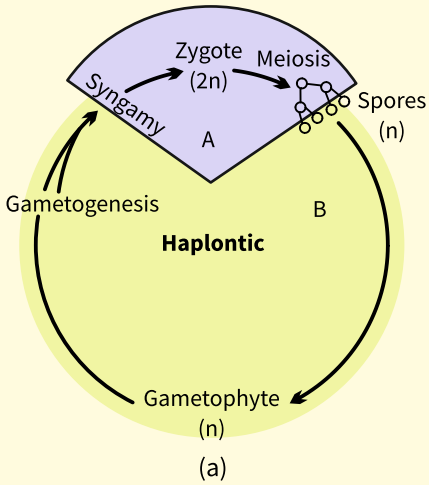
Pinus

Cedrus

Sequoia

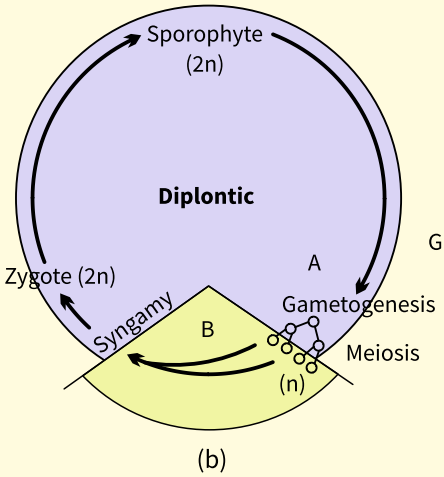
## PLANT LIFE CYCLE ALTERATION OF GENERATION

- Haplontic life cycle- Gametophytic generation- free living, photosynthetic. Zygote is sporophytic generation (single celled). Ex- Spirogyra, volvox, chlamydomonas.
- Diplontic life Cycle- Gametophytic generation- only few to single celled
- sporophytic generation is dominant, independent & photosynthetic. Fucus & gymnosperms & angiosperms are examples.
- Haplo – Diplontic life cycle- bryophytes show dominant gametophyte while pteridophytes show dominant sporophyte. Gametophyte alternate with sporophyte. Example - Ectocarpus and Polysiphonia



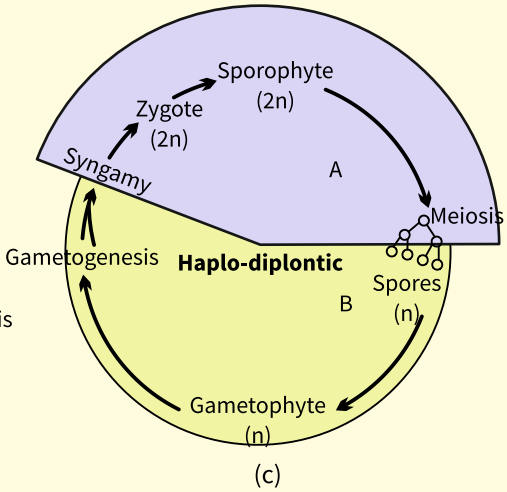

(a)

**DOMINANT GAMETOPHYTIC STAGE**




(b)

**DOMINANT SPOROPHYTIC STAGE**




(c)

**EQUALLY DOMINANT GAMETOPHYTIC AND SPOROPHYTIC STAGE**