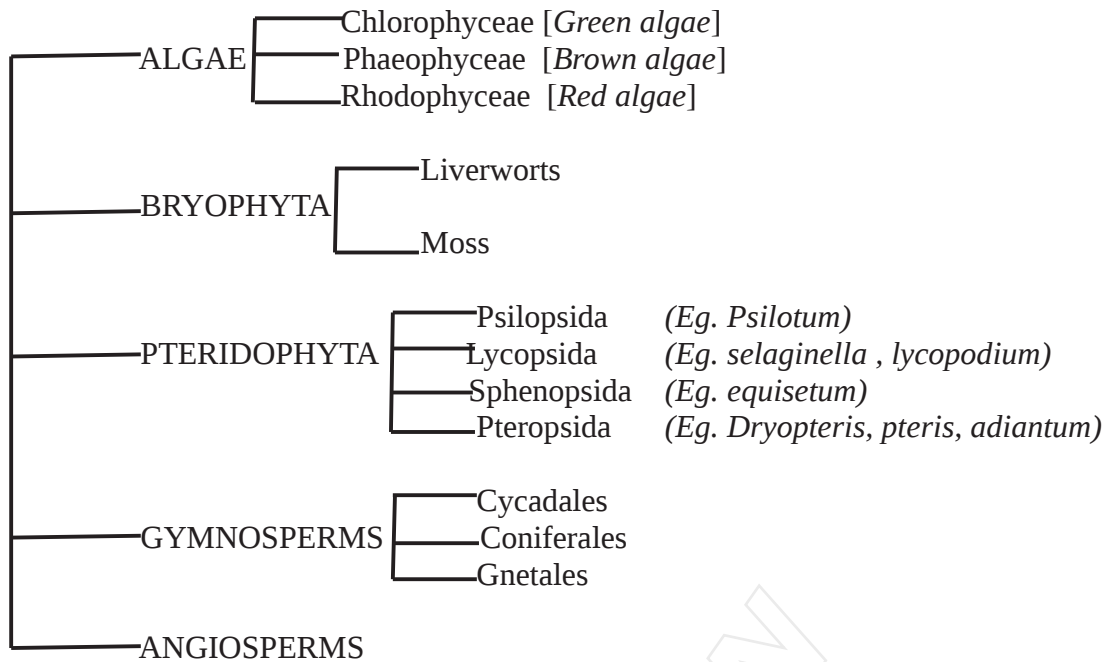


# KINGDOM PLANTAE

**Classification :-** This kingdom has classified as ,Algae, Bryophyta, Pteridophyta, Gymnosperms, Angiosperms



## Algae:-

- Chlorophyll bearing simple, thalloid organisms
- mostly aquatic; size varies from unicellular to multicellular
- they exists as unicellular, colonial, filamentous and massive plant bodies

Unicellular	colonial	filamentous
Eg. Chlamydomonas, Chlorella	Volvox,	Spirogyra, ulothrix

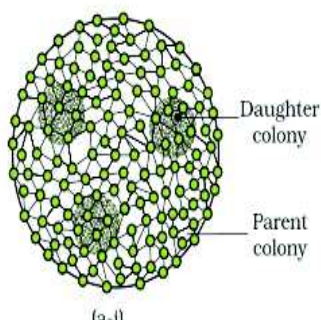
- Reproduction by vegetative, asexual and sexual means
- vegetative reproduction by fragmentation
- asexual by zoospores
- sexual by gametes
- isogamy, anisogamy and oogamy are different sexual reproduction types
- in isogamy similar gametes are fused ; in anisogamy dissimilar gametes are fused; but in oogamy one gamete is motile other is non motile.

### Economic importance of alga

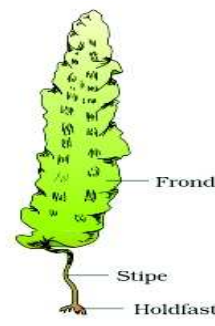
- ✓ half of the total carbon dioxide fixation is done by alga
- ✓ some are used as food[ eg. porphyra, laminaria, sargassum]
- ✓ algin from brown algae and carrgeen from red alga are commercially important
- ✓ Agar obtained from gracillaria and gelidium is used to grow microbes and in preparation of ice creams and jellies.
- ✓ Chlorella and spirulina are used by space travellers



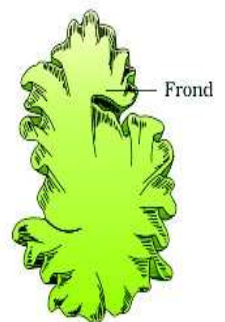
*Chlamydomonas*  
Chlorophyceae



*Volvox*  
Chlorophyceae



*Laminaria*  
Brown alga



*Porphyra*  
Red alga

Class	Common name	Major pigments	Stored food	Features
Chlorophyceae	Green alga	Chlorophyll a,b	starch	-chloroplast shape varies from cup shape, star shape, plate like, reticulate, ribbon shaped -pyrenoids are the storage bodies located in chloroplast. They contain starch and proteins <i>Eg. ulothrix, Chara, volvox, spirogyra</i>
Phaeophyceae	Brown alga	Chlorophyll a,c fucoxanthin	Laminarin, Manitol	-Plant body is divided into three parts holdfast, stipe and frond -by holdfast it is attached to substratum -stipe is stalk -frond is leaf like part <i>Eg. ectocarpus, dictyota, laminaria, sargassum, Fucus</i>
Rhodophyceae	Red alga	Chlorophyll a,d phycoerythrene	Floridean starch	-flagellar form is absent <i>Eg. Polysiphnia, prophyra, gracilaria, gelidium</i>

### **Bryophytes**

- commonly called as amphibians of plant world, because they are the land plants but water is necessary for them to complete the life cycle
- live in moist shady places
- they play an important role in succession on rocks
- it is thallus like; body consist of leaf like root like and stem like parts
- the main plant body is haploid and produce gametes ; so called gametophyte.
- Male sex organ is antheridium while female sex organ is archegonium
- antheridium is club shaped while archegonium is flask shaped
- antheridium produce anthozoid while archegonium produce egg
- antherozoid is motile while egg is non motile
- After the fusion of antherozoid and egg zygote is formed. From zygote diploid sporophyte is produced
- sporophyte is spore producing plant.
- Sporophyte is not free living; it is attached to gametophyte.

#### **Economic importance of bryophyte**

- ✓ some mosses provide food to animals and birds
- ✓ important role in succession; is an ecological importance
- ✓ prevent soil erosion
- ✓ sphagnum, otherwise called as peat moss is used as packing material because is water holding capacity

Class	Example	Features
Liwerworts	Marchantia, Riccia	<ul style="list-style-type: none"> <li>• <i>Thallus is dorsiventral</i></li> <li>• <i>asexual reproduction by fragmentation and gemmae</i></li> <li>• <i>gemmae are green asexual buds developed inside gemmae cup</i></li> <li>• <i>from zygote sporophyte is formed</i></li> <li>• <i>sporophyte is differentiated into foot, seta and capsule.</i></li> <li>• <i>Spores are formed inside capsule</i></li> </ul>
Mosses	Funaria, polytrichum, sphagnum	<ul style="list-style-type: none"> <li>• <i>Gametophyte has two stages; protonema stage and leafy stage</i></li> <li>• <i>protonema is the green filamentous alga like structure formed after the germination of spores</i></li> <li>• <i>on protonema buds are formed and from them a leafy plant is developed</i></li> </ul>

### **PTERIDOPHYTES**

- ✓ are the first terrestrial vascular plants; they are the first plants with xylem and phloem
- ✓ include horsetails and ferns
- ✓ live in cool, damp, shady places
- ✓ main plant body is diploid sporophyte
- ✓ the sporophyte bear sporophylls (leaves)
- ✓ the sporophylls possess sporangia; inside the sporangia spores are developed
- ✓ in some pteridophytes sporophylls has a clustered and compact appearance called cones
- ✓ cones are otherwise known as strobilus[ seen in equisetum and selaginella]
- ✓ the spores germinate to form an independent, multicellular prothallus.
- ✓ Prothallus is gametophyte; it produce gametes inside the antheridium and archegonium
- ✓ some pteridophytes produce two type of spores; large megaspores and small microspores.
- ✓ The megaspores and microspores germinate to form female and male gametophytes respectively.
- ✓ Plants which produce two types of spores are called heterosporous. eg.selaginella,salvinia
- ✓ plants which produce only one type spores is called homosporous.

#### **Seed habit in pteridophytes**

In heterosporous plants the female gametophyte is retained on parent sporophyte. Here the zygote develop into embryos within the female gametophyte. This event is the precursor of seed habit.

### **GYMNOSPERMS**

- commonly called naked seeded plants; i.e seeds are not enveloped by fruit wall.
- It include trees and shrubs.
- Roots are generally tap roots.
- In some genera roots are associated with fungus to form mycorrhiza. eg. Pinus
- small specialised roots are seen in some genera called coralloid roots. They are associated with nitrogen fixing cyanobacteria. eg.cycas
- they are heterosporous; microspores and megaspores are developed
- microspores are produced inside microsporangium and megaspores inside megasporangium
- megasporangium is developed on megasporophylls while microsporangium on microsporophylls.
- Sporophylls are clustered to form cones; otherwise called as strobilus. [male and female strobilus]
- megaspores germinate to form female gametophyte; while microspores to male gametophyte.
- Female gametophyte produce female sex organ called archegonium
- microspores develop into pollen grains.

### Adaptations in gymnosperms

- ✓ in coniferales needle like leaves reduce surface area ; are adaptations to extreme wind and temperature.
- ✓ Presence of thick cuticle help in high temperature
- ✓ sunken stomata reduce water loss

### ANGIOSPERMS

- ◆ They are the enveloped seeded plants; produce flowers and fruits
- ◆ classified into two classes; dicotyledons and monocotyledons
- ◆ flowers are responsible for sexual reproduction
- ◆ pistils or carpels are the female sex organ while stamens are male sex organs
- ◆ stamen have two parts anther and filament.
- ◆ Inside the anther pollen grains are produced
- ◆ pistil has three parts ovary, style and stigma.
- ◆ the base of pistil consist of ovary. Inside which the ovules are produced.
- ◆ Inside the ovule embryo sac is seen.
- ◆ Embryo sac shows eight nuclei.; 1 egg, 2 synergids, 3 antipodals, 2 polar nuclei.
- ◆ 2 polar nuclei fuse together to form a diploid secondary nucleus.
- ◆ Pollen grain reach at stigma and pollen tube is formed.
- ◆ Inside the pollen tube two male gametes are developed. They are discharged inside embryosac.
- ◆ One male gamete fuses with egg to form zygote; while other male gamete fuses with secondary nucleus to form triploid Primary Endosperm Nucleus(PEN). This is called double fertilisation.
- ◆ The zygote later develop into embryo while PEN develop into endosperm.
- ◆ Endosperm provides nourishment t developing embryo.
- ◆ In angiosperms, after fertilisation ovule envelop in seed and ovary develop into fruit

### LIFE CYCLES

Three types of life cycles are there; haplontic, haplodiplontic, diplontic

<i>Haplontic</i>	<i>Haplodiplontic</i>	<i>Diplontic</i>
Haploid gametophytic stage is dominant here	Haploid gametophytic and diploid sporophytic phase is more or less equal	Diploid sporophytic phase is dominant here
Eg.algae	Eg.bryophytes,pteridophytes	Gymnosperms,angiosperms

