



PLANT KINGDOM

IMPORTANT POINTS

Fungi, monerans, protists were earlier included in plant Kingdom but not now. BGA is not an algae anymore

Various Systems of classification

Earlier systems were based on gross morphology like habitat, colour, no. & shape of leaf

Artificial system

Based mainly on vegetative characters (easily affected) or on the androecium structure. Eg- Linnaeus classification of plants based on no. Of androecium. It had drawbacks like it separated closely related species, were based on few characters & equal weightage given to vegetative & sexual characters

Natural system

Based on natural affinities among organisms & consider external, internal, ultra structure, anatomy, embryology, photochemistry. Eg- George Bentham & Joseph Dalton Hooker classification of flowering plants

Phylogenetic system

Most acceptable, based on evolutionary relationships, organisms belonging to Same taxa have common ancestor.

DIFFERENT KINDS OF TAXONOMY

NUMERICAL TAXONOMY

Based on observable characters using computers (no. & codes are assigned to each character) each character is given equal importance.

CYTOTAXONOMY

Based on chromosome no., structure, behaviour

CHEMOTAXONOMY

Chemical constituents of the plant to resolve confusions

ALGAE/THALLOPHYTA

INTRODUCTION

They are chlorophyll bearing simple thalloid, autotrophic & largely aquatic (both fresh & marine) org. Some algae form association with fungi(lichen). with animals (on sloth bear)

ECONOMIC IMPORTANCE

They fix 1/2 of the total CO₂, They are primary producers & is energy source for aquatic animals Fg- PORPHYRA, LAMINARIA, SARGASSUM are used as food. Algin (brown algae) & carrageen (red algae) produce hydrocolloids (water holding subst.) Agar is produced from Geledium & gracilaria. Chlorella & spirulina are used as space food (SCP-Single cell protein)

SIZE & FORM

Chlamydomonas(microscopic unicellular), volvox(colonial), ulothrix & spirogyra(filamentous), kelps (massive marine form)

REPRODUCTION

VEGETATIVE: By fragmentation. Each fragment develops into thallus

ASEXUAL: By production of zoospores (motile)

SEXUAL: By fusion of 2 gametes

Isogamous

- Gametes are similar in size
- 1) if motile- chlamydomonas
- 2) if nonmotile- spirogyra

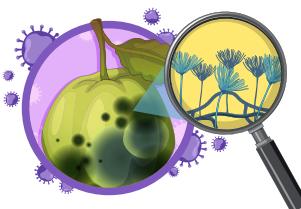
Anisogamous

- Gametes are different in size but of same capability to move Eg- some species of chlamydomonas i.e. Uidorina

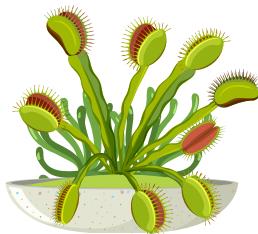
Oogamous

- Female gamete is non motile but male is motile Eg- volvox, fucus

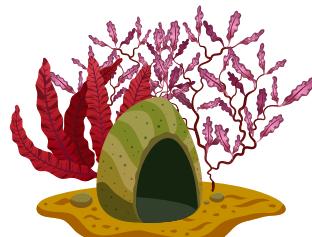
TYPES OF ALGAE



Chlorophyceae /green algae: Plant body is unicellular/colonial/ filamentous. Possess chl-a & b. Possess different shapes. Have stored food as starch or oil. Have pyrenoid(starch synthesis) body in chloroplast for storing protein. Inner cell wall->cellulose & outer wall->pectose. Vegetative rep.=> fragmentation, spores. Asexual =>by zoospores. Sexual =>isogamy, anisogamy, oogamy. Found in fresh, brackish, salty water. Have 2-8 equal & apical flagella
Eg-chlamydomonas, volvox, ulothrix, pirogyra, chara



Phaeophyceae /brown algae: Branched, filamentous (ectocarpus). Have chl a,c,xanthophylls, caroteins. Have stored food as laminarin or mannitol. Have cellulose cell wall. Have gelatinous covering of ALGIN. Plant parts are Holdfast,stipe, frond. Vegetative-> by fragmentation. Asexual-by zoospores (heterokont) sexual-> by iso,aniso,oogamy. Gametes are pyriform (pear shaped) & bear a laterally placed flagella. Found rarely in fresh water, mostly in brackish & salt water. Have 2 unequal lateral flagella. Cellulose, pectin & polysulphate esters are found in cell wall.
Eg-Ectocarpus, dictyota, laminaria, sargassum,fucus, kelps



Rhodophyceae /red algae: They are multicellular. Have red pigment r-phycoerethrin. Found in warmer areas & occur in all light regions. Stored food is floridean starch which is similar to amylopectin & glycogen in structure. Vegetative-> frag. Asexual-> nonmotile spores Sexual->oogamous by non motile spores. Found some in fresh & brackish water but most in salt water. Do not have any flagella.
Eg-polysiphonia, porphyra, glacilaria, geledium

INTRODUCTION

Live in soil but dependent on water for sexual repro. Play important role in plant succession on bare rocks/soil They also have thalloid like body but more differentiated than algae. Main members of bryophytes are mosses

Sex organs are multicellular and jacketed. Male sex organ -> Anthridium (antherozoid) Female sex organ -> archaegonium (eggcell)

SEX ORGANS

STRUCTURE/PLANT BODY

It is thallus like, prostrate & erect. Have rhizoids in place of roots. Lack true root, stem, leaf but may possess structure like them. Main plant body is haploid (gametophytic cause produces gametes)

Antherozoids (n) released in water come in contact with archaegonium/egg(n) -> zygote (2n)
->sporophyte(2n) -> spores(n) -> germination -> gametophyte(n)

FERTILISATION & DEVELOPMENT

ECONOMIC IMPORTANCE

Some mosses provide food for herbaceous mammals, birds, other animals. Species of sphagnum, a moss provide peat that have long been used as fuel, and because of their capacity to hold water used as packing material for transshipment of living material. Mosses with lichens are first to colonise rocks & hence are of great ecological importance. Act as Decomposers of rocks making suitable for growth of higher plants. Form green matts & prevents soil erosion.

Plant body is thalloid & thallus is dorsiventral & closely appressed to substrate. Leafy members have tiny leaf in rows looking like stem. Perform ASEXUAL by fragmentation or gemmae formation & SEXUAL as sex organs are present on same or diff. thalli. Sporophyte is consist of foot + setae + capsule. Spores are produced within capsule. They have free living gametophyte & sporophyte is parasitised on it. Eg- marchantia,

LIVERWORTS

MOSSES

Predominant stage is gametophyte. Consists of 2 stages- > protonema & leafy. Protonema develops from spore, creeping green, branched & frequently filamentous stage. Leafy develops from sec. protonema as a lateral bud,consist of spirally arranged leaves (this stage contains sex organs). Perform ASEXUAL by fragmentation & budding in sec. protonema or SEXUAL by antheridia, archaegonia. After fertilisation zygote develops into sporophyte. They have elaborate mechanism of spore dispersal. Eg-funaria, sphagnum, polytrichumriccia