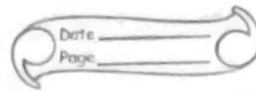


* Biological Classification *



* Aristotle was the earliest to classify plants into herbs, shrubs and trees and animals into those which had red blood and those that did not.

* Linnaeus - proposed two-kingdom system of classification i.e. Plantae and Animalia.

This system of classification is based on External Characters.

* Drawbacks of Two-kingdom system.

This system did not distinguish between

Eukaryotes and prokaryotes.

unicellular and multicellular

Photosynthetic and non photosynthetic.

* Five Kingdom Classification.

→ proposed by R.H. Whittaker (1969)

→ This classification based on

- cell structure

- Thallus organisation

- Mode of nutrition

- Reproduction

- Phylogenetic Relationship

* Kingdom Monera. (includes prokaryotes)

→ Bacteria are sole members of kingdom Monera

→ Structure is simple but complex in behaviour

→ Autotrophic [photosynthetic → prepares food with sunlight
chemosynthetic → with the help of chemicals.

- Heterotrophs [Parasitic - feed on living organism
Saprophytic - feed on dead organism

Monera

Archaeobacteria

- Found in extreme condⁿ
- Cell wall made by pepti
Pseudopeptidoglycan
- salty areas - Halophiles
- hot Springs - Thermoacidophiles
- Marshy area - Methanogens
- Methanogens are also found
in guts of dominant animals.

Eubacteria

- cell wall made up of
Peptidoglycan
- Autotrophs Heterotrophs

Autotrophs

Photosynthetic Autotrophs

- Ex - cyanobacteria (blue
green algae)
- They may be unicellular,
colonial / filamentous
- surrounded by gelatinous sheath
- More growth - Algal bloom

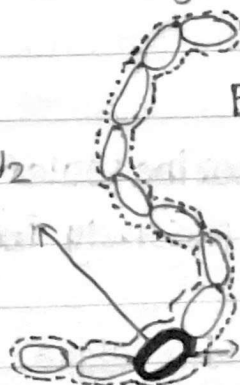
Chemosynthetic autotrophs

- Oxidise Nitrates, Nitrites,
Ammonia, Sulphates
- Used the Released energy
for ATP Production
- Play a great role in
recycling of nutrients like
nitrogen, phosphorus, iron and
sulphur

Ex - Nostoc

& Anabaena

Helps in N_2
fixation



Heterocyst

* Heterotrophic bacteria

- Most abundant, mostly decomposers
- Saprophytes - eg. decomposers
- Parasite - disease causing ex. cholera, typhoid, tetanus, citrus canker

Benefits

- Food Production
- Antibiotics production
- N_2 fixation
- Nutrient recycling

* Mycoplasma (PPLO)

- completely lack cell wall
- Smallest cell
- can live without oxygen
- Pathogenic in animals and plants

* Kingdom Protista

- They all are eukaryotes → mostly single celled
- some are multicellular
- Reproduction is Asexual and sexual
- Forms a link between plants, animals and fungi
- Some have flagella or cilia

1) Chrysophytes

- Found in freshwater and marine water
- They are planktons (floats passively with water)
- Mostly photosynthetic
- It includes Diatoms and golden algae

- Diatoms are like soap box the walls of diatoms are made by silica
- Diatomaceous earth - cells deposits of diatoms
- used in polishing, filtration of oils and syrup, Soundproof wall.
- Diatoms are Chief producers in ocean.

2) Dinoflagellates.

- Mostly marine and photosynthetic
- cell wall has stiff cellulose plates
- Red dinoflagellates (ex Gonyaulax) - causes Red tide
Gonyaulax release toxin (Saxitoxin) kills other marine animals

3) Euglenoids.

- Majority are freshwater found in stagnant water
- Instead of cell wall they have protein rich layer called pellicle
- Photosynthetic in presence of sunlight in absence of sunlight they are heterotrophs
- Pigments very similar to those of higher plants
- Ex - Euglena

4) Slime moulds

- They are Saprophytes
- During favourable condition they form Plasmodium
- During unfavourable condition they form fruiting bodies bearing spores at their tips. Spores have true cell wall
- Extremely resistant - can survive for many years
- Dispersed by air

*5) Protozoans.

- All are heterotrophs (Predator or Parasite)
- Believed to be primitive relative of animals

Amoeboid

Protozoans.

- live in fresh water sea water or soil
- Pseudopodia (Amoeba)
- Some have silica shell
- Some are Parasite as Entamoeba

Flagellated

Protozoans.

- Have flagella
- Free living
- Parasite
- Ex- Trypanosoma cause sleeping sickness

Ciliated

Protozoans.

- Have cilia
- coordinated movement of cilia brings water laden food into gullet ex- Paramecium.

Sporozoans.

- Have an infectious spore like stage
- ex- plasmodium cause malaria

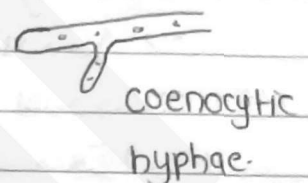
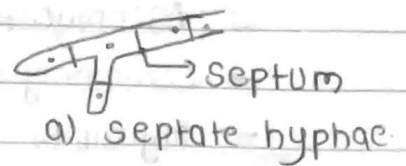
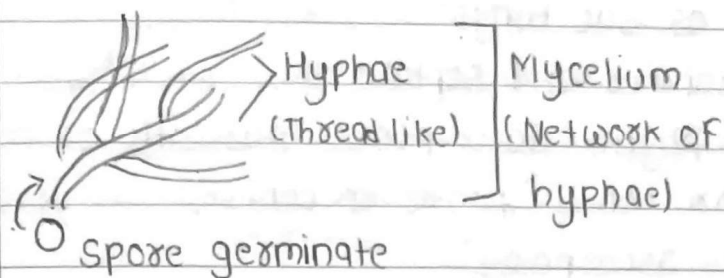
* Kingdom Fungi

- Heterotrophic
 - Saprophytes
 - Parasitic
- Mycorrhiza
 - Fungus
 - Root of higher plants
 - Absorb water & mine nutrients for plants
 - Provide food to fungus
- Example of Parasitic Fungus
 - Wheat Rust - Puccinia
 - white spots on mustard caused by Albugo candida

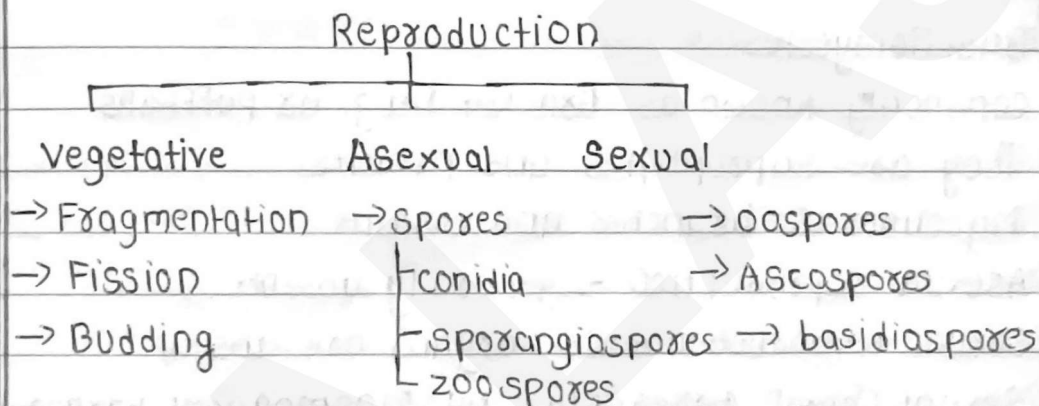
Importance of Fungi

- Source of antibiotics eg- Penicillium
- Used to make bread and beer eg- Yeast

* Structure of Fungi



→ Cell wall made up of chitin



Plasmogamy → Fusion of protoplasm betⁿ two motile or non-motile gametes

Karyogamy → Fusion of two nuclei

Dikaryon → 2 Nuclei/cell

Dikaryophase → Phase of Dikaryon

Dikaryonphase seen in Ascomycetes and Basidiomycetes

1) Phycomycetes

- Found in aquatic habitat, Decaying wood, damp places, parasite
- Mycelium is aseptate and coenocytic
- Asexual Reproduction takes place by zoospore (motile) or aplanospore (non-motile)
- Ex - Mucor, Rhizopus, Albugo

2) Ascomycetes

- commonly known as sac fungi
- Mycelium is branched and septate.
- They are saprophytic, decomposers, parasitic or coprophilous
- Asexual spores are conidia produce on conidiophores. (grow on dung)
- Sexual spores are ascospores

Ex - Yeast (Unicellular), Aspergillus, Claviceps and Neurospora
Neurospora is used in biochemical and genetic work.

3) Basidiomycetes

- commonly known as Bracket fungi or puffballs
- They are saprophytes and parasites
- Mycelium is branched and septate.
- Asexual reproduction → generally absent.
- Sexual Reproduction → Sex organs are absent
- Sexual Reprodⁿ takes place by Plasmogamy, karyogamy & meiosis.
- Ex - Agaricus (Mushroom), Ustilago (smut disease), Puccinia (Rust)

4) Deuteromycetes

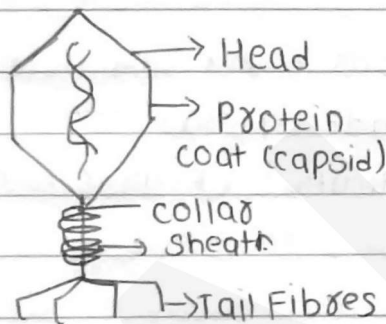
- common known as imperfect fungi because sexual stage is unknown
- Asexual spores → conidia
- Mycelium is branched and septate.
- They are saprophytes and Parasite.

Decomposers help in mineral cycling.

Ex - Alternaria, Colletotrichum and Trichoderma
↓
causes Red rot of Sugarcane.

* Virus

- They are obligate Parasite
- crystallised structure → outside cell
- when infect the host cell → they replicate themselves → ^{and kill the} host cell
- History → 1) Louis Pasteur - Gave the name virus
- 2) D.J Ivanowsky → Discovered virus in Tobacco (TMV)
- 3) M.W Beijerinck → Stated that fluid containing virus is infectious called as Contagium vivum fluidum (infectious living fluid)
- 4) W.M Stanley → proposed that virus are crystallised



Capsid - made by small units capsomere
Genetic material → RNA or DNA
Plant virus → has SSRNA
Bacteriophage → double stranded DNA
Animal virus → SS/ds RNA or dsDNA

Animal viral diseases

mumps, small pox, herpes, influenza, AIDS

Plant Viral Symptom

mosaic formation, leaf rolling, yellow veins, stunted growth

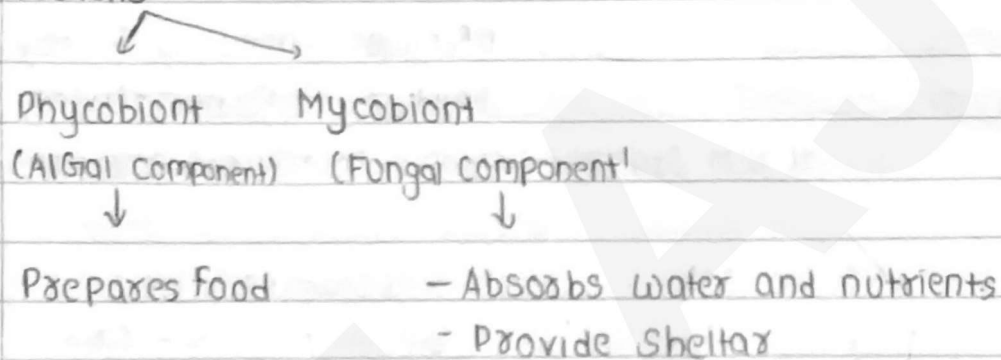
* Viroids

- Discovered by T.O. Diener (1971)
- Potato spindle tuber disease
- only RNA → low molecular weight
- No protein coat
- smaller than virus

* Prions.

- Abnormally folded protein
- Disease caused → Bovine spongiform encephalopathy (BSE)
also known as mad cow disease
→ Creutzfeldt-Jakob disease (CJD) - in human

* Lichens



- Lichens are very good indicators of pollution.