

Biological Classification

Monera :- 4 types $\Rightarrow$ Coccus (pl. cocci) - spherical
Bacillus (pl. bacilli) - rod (eg. E. coli)
Vibrium (pl. Vibrio) - comma
Spirillum (pl. spirilla) - spiral

Archaeobacteria :- different cell wall structure
 Eg :- Methanogens, thermophilic
 halophiles

Eubacteria :- Peptide glycane cell wall
 ① Cyanobacteria :- (or blue-green algae) autotrophic & gelatinous sheath
 - Chl a, all species ~~autotrophic~~ oxygenic
 eg - Nostoc
 Anabaena
 Oscillatoria
 Spirulina
 Microcystis $\rightarrow$ uses nitrogenase to fix N
 form specialized cells called Heterocysts to fix Nitrogen

② Chemosynthetic bacteria :- Oxidise nitrate, nitrite or ammonia
 and use released energy for ATP Products
 - process inorganic substances
 - recycle N, P, Fe, S -

eg :- Nitrosomonas
 Thiobacillus
 Iron Sulphur bacteria
 Purple Sulphur bacteria

② Heterotrophic bacteria :- most abundant

eg:- Lactobacillus - making curd from milk

Rhizobium - fix N_2 in legume of roots

Streptomyces - production of antibiotics

Some pathogens that cause damage:-

Cholera - Vibrio Cholerae

Typhoid - Salmonella Typhi

Tetanus - Clostridium tetani

Citrus canker - Xanthomonas - Plants

Reproduction :- Mainly fission

Under unfavourable conditions - produce spores

Also have a primitive type of sexual reproduction
↳ DNA Transfer from one bacterium to the other.

④ Mycoplasma :- lack cell wall

smallest cell (living) - known - 0.1 μm

can survive without O_2

mostly pathogenic to both plants and animals.

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Protista :-

- ① **Chryophytes** :- Diatoms and -disoids
 - overlapping shells
 - cell wall embedded with silica (indestructible)
 - form diatomaceous earth
 - cheap producers of oceans
- ② **Dinoflagellates** :- cell wall - stiff cellular plates
 - eg - *Gonyaulax* - Red tides, Toxic
- ③ **Slime Moulds** :- Saprophytic protists - body moves along decaying twigs and leaves
 - form aggregation called plasmodium (fruitful)
 - (outer layer called pellicle made of v)
- ④ **Euglenoids** :- have ~~cell~~ ~~cellular~~ ~~plates~~ cell walls
 - eg :- *Euglena* - both autotroph and predator (heterotroph)
- ⑤ **Protozoans** :- predator or parasite
 - a) **Amoeboid protozoans** :-
 - eg :- *Amoeba*
 - *Entamoeba*
 - b) **Flagellated protozoans** :-
 - eg :- *Trypanosoma* - cause sleeping sickness
 - c) **Ciliated** :- eg :- *paramecium* - have gullet
 - d) **Sporozoans** :-
 - eg :- *Plasmodium* - malarial parasite

fungi :-

Asexual form spores - conidia / sporangiospores / zoospores

Sexual Reproduction - by oospores, ascospores, basidiospores

'in 3 steps' :-

1) Plasmogamy

2) Karyogamy - may be dikaryophase

3) Meiosis in Zygote

Note :- Base of Classification :-

Morphology, Spore formation, fruiting bodies.

(1) Phycomycetes :- aseptate and coenocytic

eg:- Mucor, Rhizopus (bread mould)
Albugo (a parasitic fungus on mustard)

(2) Ascomycetes :- (or sac-fungus) - branched and septate

eg:- Penicillium

Yeast (Saccharomyces) - unicellular

Aspergillus

Claviceps

Neurospora - used in biochemical or genetic work

Morrels

Truffles

} Delicacies, edible

(3) Basidiomycetes :- Branched and septate

eg:- Agaricus (mushroom) - puff balls, bracket fungi

Ustilago (Smut)

Puccinia (Rust)

- (4) Deuteromycetes (fungi imperfecti) : only asexual or vegetative phase found. (only asexual spores - conidia)
- mostly decomposers of litter / help in mineral cycling

eg:- Alternaria, Colletotrichum
Trichoderma

Virus :- (Obligate parasites)

- have either DNA or RNA

- Plant Virus :- have SS RNA.

Symptoms:- mosaic formation, leaf rolling, curling, yellowing of vein clearing, dwarfing, and stunted growth.

- Animal Virus :- have SSRNA, DSRNA or DSDNA

- Mumps, small pox, herpes, influenza, AIDS

eg:- TMV (SSRNA) - Tobacco Mosaic Virus - first discovered

- Bacterial Virus - (affects bacteria) - usually DSDNA

- Bacteriophage

Viroids - T.D. Diener (1971)

- free RNA, smaller than virus
low molecular weight

- only affect plants

Prions :- cause neurological diseases, abnormally folded proteins

eg:- bovine spongiform encephalopathy (BSE) - cattle - mad cow disease
(or) Jacob disease (CJD) - in humans

Lichens :- good pollution indicators

(Algae (or) photobiont) :- prepare food

+ water
(fungi (or) mycobiont) :- provide shelter + absorb mineral nutrients^m
(mainly phosphorus)