

BIOLOGICAL : : CLASSIFICATION

① Aristotle divided organisms in plant and animals.

② 2 Kingdom Classification →
Carlous Linnaeus

Plant Kingdom Animal Kingdom

③ 3 Kingdom Classification →
Ernest Haeckel (added protista)

④ 4 Kingdom Classification →
Copeland (added Monera)

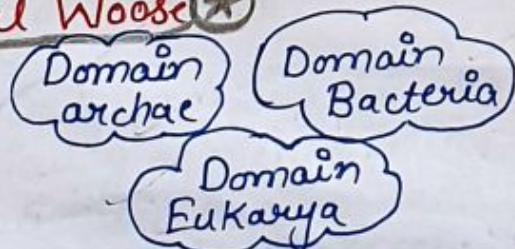
⑤ 5 Kingdom Classification →
RH Whittaker (1969) ★
added fungi.

→ Main criteria for Classification

- ① Cell structure
- ② Cell wall
- ③ Body Organisation
- ④ Mode of nutrition
- ⑤ Reproduction
- ⑥ phylogenetic relationships

⑥ 6 Kingdom Classification →
3 Domain Classification

Carl Woese ★



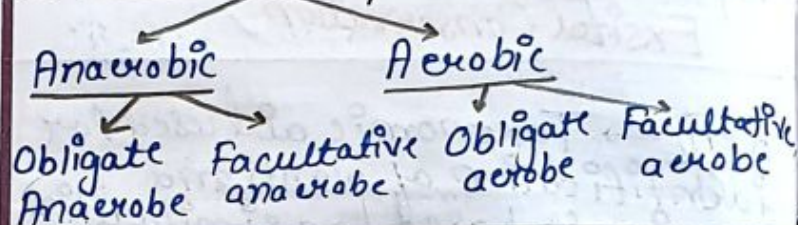
Kingdom Monera

Unicellular prokaryotes, peptidoglycan

① Shapes of Bacteria →

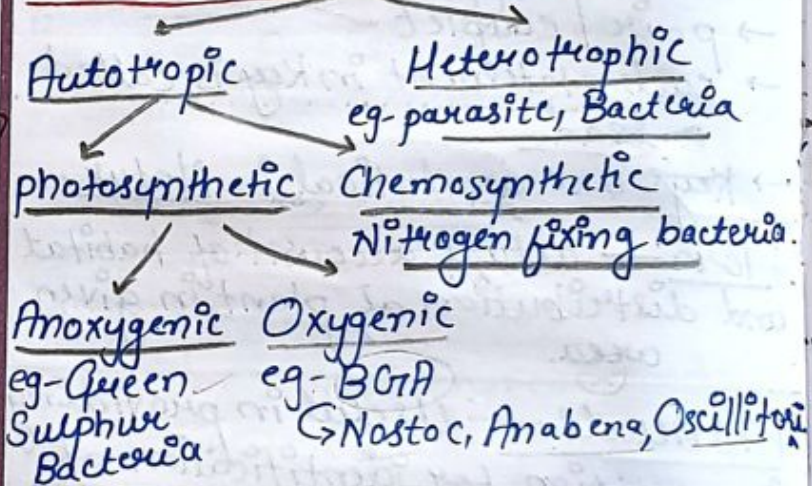


② Bacterial Respiration →

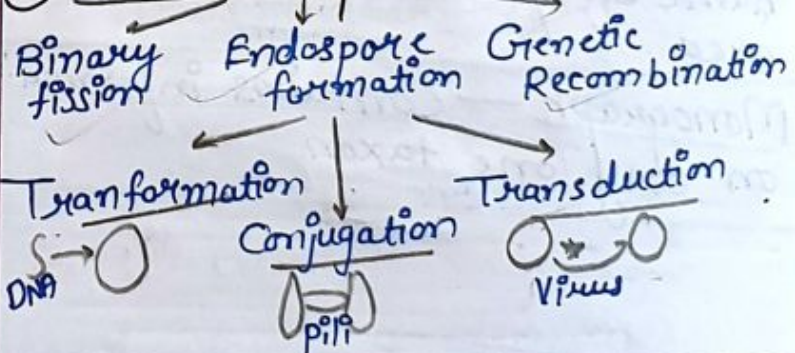


③ Bacterial Nutrition →

Most diverse nutrition ★★



④ Bacterial Reproduction →



⑤ Monera →

1) Archae bacteria →

Have some features of Eubacteria as well as Eukaryotes.
Found in extreme conditions.

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Extremophiles, Halophiles,
Thermoacidophiles, Methanogens.
Help in digestion of cellulose in gut
of cattle

Different Cell Wall
eg- Methanobacterium

2) Eubacteria →

Unicellular, filamentous, aquatic,
terrestrial.

- photosynthetic ✓
- Blue Green Algae.
- Chl A. → O_2 releasing (★)

eg- Nostoc, Anabaena, Oscillatoria.

Heterocyst for N_2 fixation

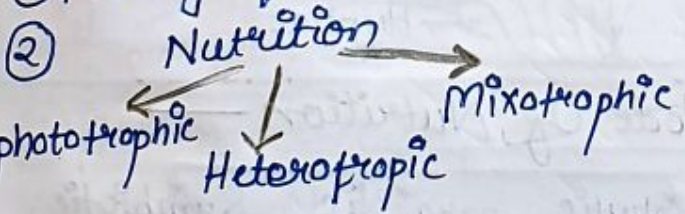
6) Mycoplasma →

- Bacteria without cell wall
- PPLO, → Smallest Cell.
- Cause diseases like Mycoplasma pneumonia.
- Facultative aerobic.

gelatinous sheath

Kingdom Protista Unicellular Eukaryotes

① Mostly aquatic.



③ Formation of protista explained by
endosymbiotic theory.

④ Protista →

- Chrysophytes
 - Dinoflagellates
- } photosynthetic

Euglenoids — Mixotrophic.

Slime moulds } Heterotrophic
Protozoans }

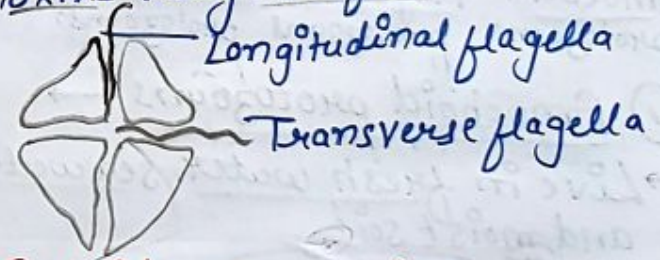
⑤ Chrysophytes →

Diatoms (chief producers in ocean)
Desmids (golden algae)

- phytoplanktons.
- fresh water and marine environment
- Cell wall embedded with Silica.
- Soap Case Cell Wall
- Cell wall forms 2 thin overlapping shells.
- Diatomaceous Earth → polishing, filtration of oils.

⑥ Dinoflagellates → (colourful whiplashes)

- Mostly marine and photosynthetic.
- Appear Yellow, green, brown, blue or red
- Cell wall has cellulosic plates on outer surface.
- Toxins may kill fish.



→ Red tide - Gonyaulax

⑦ Euglenoids → (Euglena)

- Majority are fresh water organisms, found in stagnant water.
- Mixotrophic Nutrition
- Instead of cell wall, protein rich layer called pellicle.

(★)

→ photosynthetic pigment resembling higher plants.

⑧ Slime Moulds

Saprophytic protists

→ "plasmodium" may grow over several feet.

→ During Unfavourable Conditions, fruiting bodies bearing spores are formed.

→ Spores possess true Wall.



⑨ Protozoa (Heterotrophic)

Amoeboid protozoans Flagellated protozoans Ciliated protozoans Sporozoans

① Amoeboid protozoans →

→ Live in fresh water, sea water and moist soil

→ pseudopodia

→ Marine forms have silica shells

→ Entamoeba is parasite

② Flagellated Protozoans →

→ Either free living or parasitic.

→ Flagella present

eg- Trypanosoma (Sleeping Sickness)
Trichomonas (Vector Tse-Tse fly)



③ Ciliated protozoans →

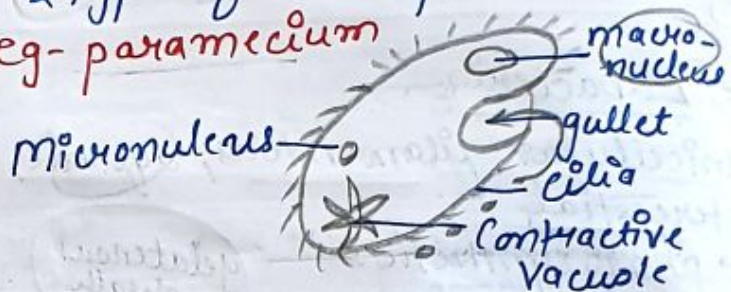
→ aquatic

→ Cilia present

→ Food stored into gullet with help of cilia.

→ 2 types of Nuclei present.

eg- paramecium



④ Sporozoans →

→ Infectious spore like stage present in life cycle.

eg- Plasmodium (causes Malaria)

Kingdom Fungi

multicellular Eukaryotes

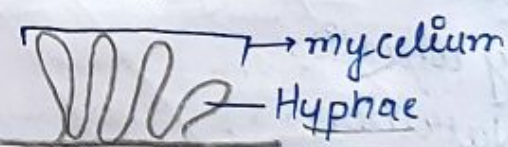
① Can be harmful (Rust, Smut) as well as beneficial (Yeast, penicillium)

② Yeast is Unicellular

eg- Saccharomyces Cerevisiae

→ Baker's Yeast / Brewers Yeast

③



② Mode Of Nutrition →

Saprophytic
grows on dead organic matter

parasitic
grows on living organisms

Symbiotic
Mycorrhiza
High plant
minerals
Glucose

phycobiont
algae

mycobiont
fungi

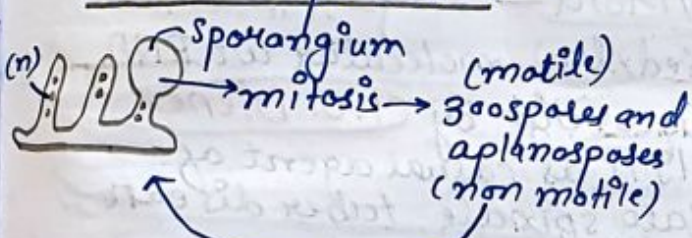
Lichens

③ Fungi →

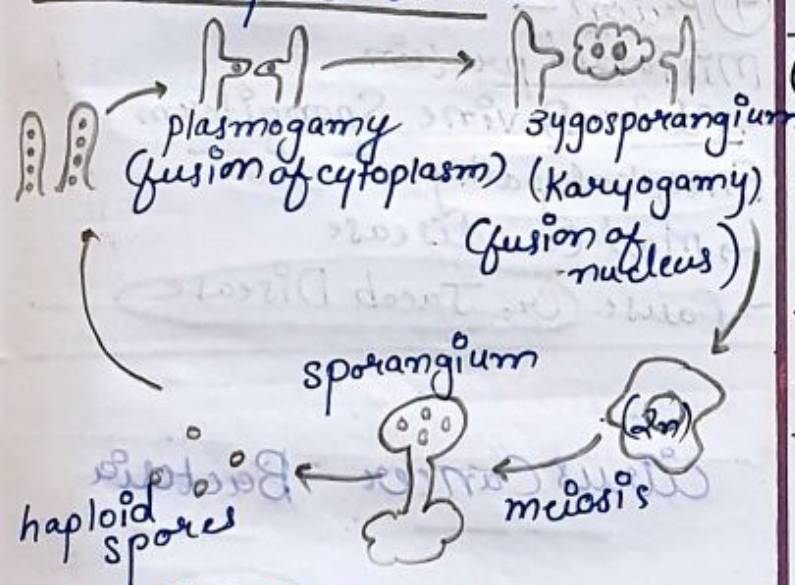


① phycomyces / Zygomycetes →

- Algal fungi.
- only group to have aseptate and cenocytic hyphae.
- Asexual Reproduction →



→ Sexual Reproduction →



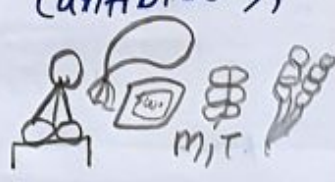
eg → RAM → Mucor
Rhizopus Albugo

② Ascomycetes (Sac Fungi) →

Yeast (Bread), penicillium (antibiotic), Molds, truffles.

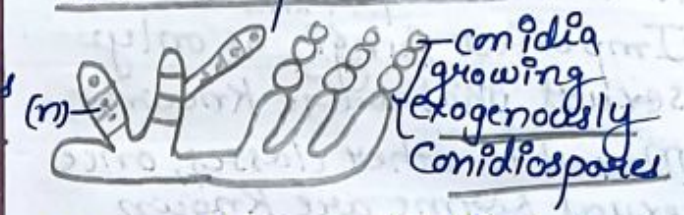
Aspergillus
Claviceps

Neurospora (used in biochemical and genetic work)

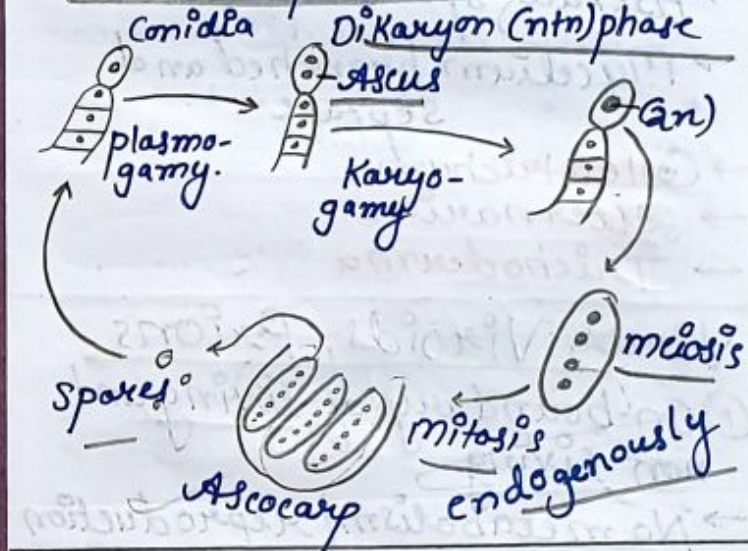


Septate and Branched hyphae.

→ Asexual Reproduction →



→ Sexual Reproduction →



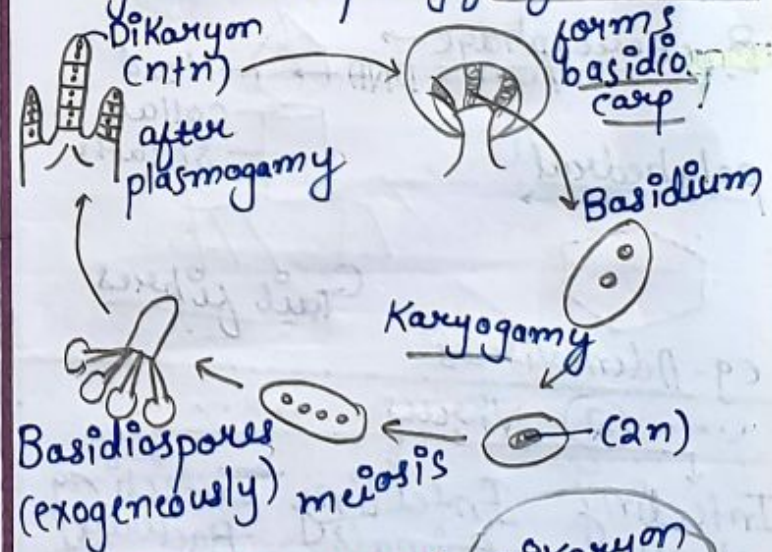
③ Basidiomycetes →

Commonly Known forms are mushrooms, bracket fungi, puff balls.

→ Branched and septate hyphae.

→ No asexual spores

→ Vegetative rep. by fragmentation.



eg - Puccinia (Rust)
Ustilago (Smut)
Agaricus (mushroom)

Dikaryon stage → long time

④ Deuteromycetes →

- No sexual reproduction
- Imperfect fungi, as only asexual phases are known
- Moved to other classes, once sexual forms are known
- Asexual spores are Conidia
- Mycelium branched and septate
- Colletotrichum
- Alternaria
- Trichoderma

Virus, Viroids, Prions

① On boundary of living and non living.

- No metabolism/ reproduction Out of host.

→ Nucleoproteins

→ Non Cellular

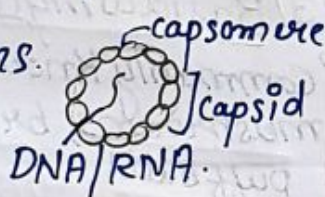
→ Shapes:

Helical →



RNA

eg- Tobacco Mosaic Virus



Bacteriophage →



polyhedral →



eg- Adenovirus

② Virus

Infecting plants

[ssRNA]

Infecting Animals

[ssRNA
dsRNA
dsDNA]

Infecting Bacteria

[dsDNA]

② Term Virus - By Pasteur

DJ Ivanowsky - Some microbes smaller than ^{bacteria} viruses cause tobacco mosaic virus

MW Beijerinck - "Contagium Vivum fluidum"

WM Stanley - 1935 - Crystallised Virus. → mostly proteinaceous crystal

③ Viroid → { - low molecular weight RNA

→ Discovered by T.O. Diener in 1971 as causal agent of potato spindle tuber disease.

④ Prion →

- Misfolded protein
- Cause Bovine Spongiform Encephalopathy
- Mad Cow disease
- Cause Cr. Jacob Disease

Citrus Cancer - Bacteria

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