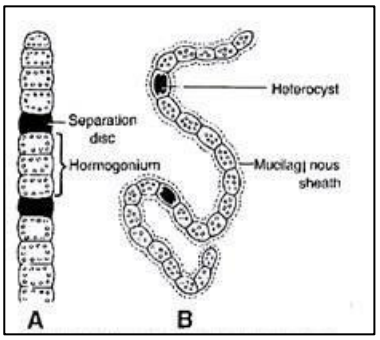
Mycology

A fungus is any member of the group of eukaryotic organisms that includes microorganisms such as yeasts and molds, as well as the more familiar mushrooms. These organisms are classified as a kingdom, fungi, which is separate from the other eukaryotic life kingdoms of plants and animals.

Thallus Organisation

The plant body of true fungi is a thallus. It may be non-mycelial or mycelial. The non-mycelial forms are unicellular. However, they may form a pseudomycelium by budding. In mycelial forms, the plant body is made up of thread-like structures called hyphae (sing. hypha).



Cell Organisation

The cell wall of fungi is mainly made up of chitin and cellulose. Chitin is a polymer of N-acetyl glucosamine. On the other hand, the cellulose is nothing but a polymer of d-glucose. Besides, the cell wall may be made up of cellulose-glycogen, cellulose-chitin or polygalactosamine-galactan.

Nutrition

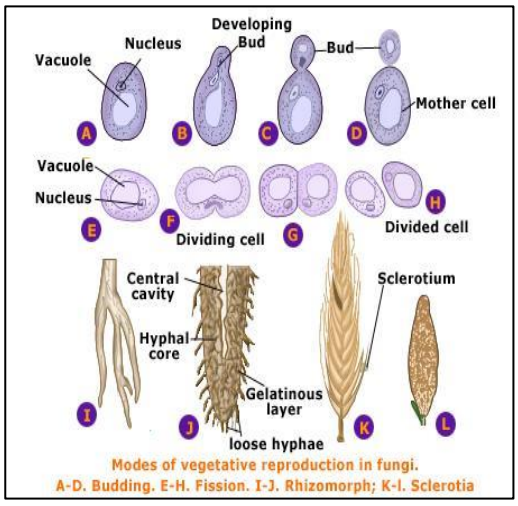
The fungi are achlorophyllous organisms. Hence, they cannot prepare their food. They live as heterotrophs *i.e.*, as parasites and saprophytes. Some forms live symbiotically with other green forms.

- **Parasites:** They usually obtain their food from a living host. A parasite could be facultative or obligate. The obligate parasites survive and settle on a living host throughout their life. The facultative parasites are saprophytes that have turned parasitic.
- **Saprophytes:** These organisms procure their nutrition from dead and decaying organic matter. The saprophytes are either obligate or facultative. An obligate saprophyte remains saprophytic during its entire lifetime. While a facultative saprophyte is nothing but a parasite that has secondarily become saprophytic.
- **Symbionts:** Some fungi develop in symbiotic association with the green or blue-green algae. These constitute the lichen. Here the algal component is photosynthetic. While the fungal component plays the reproductive part.

Reproduction

The fungi either reproduce vegetatively, asexually or sexually:

- **Vegetative Reproduction**



- **Fragmentation:** Some forms belonging to Ascomycotina and Basidiomycotina multiply by breakage of the mycelium.
- **Budding:** Some unicelled forms multiply by budding. A bud arises as a papilla on the parent cell and then after its enlargement separates into a completely independent entity.

- **Fission:** A few unicelled forms like yeasts and slime moulds multiply by this process.

- **Asexual Reproduction**

- **Sporangiospores:** These are thin-walled, non-motile spores formed in a sporangium. They may be uni-or multinucleate. On account of their structure, they are also called as aplanospores.

- **Zoospores:** They are thin-walled, motile spores formed in a zoosporangium.

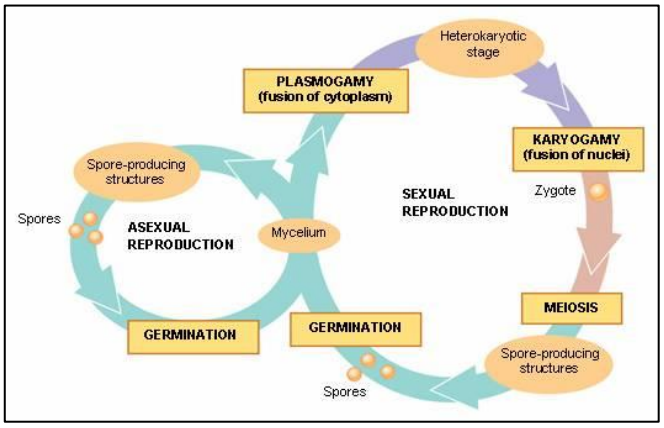
- **Conidia:** In some fungi, the spores are not formed inside a sporangium. They are born freely on the tips of special branches called conidiophores. Thus, these spores are conidia.

- **Sexual reproduction:** With the exception of Deuteromycotina (Fungi imperfecti), we find sexual reproduction in all groups of fungi. During sexual reproduction, the compatible nuclei show a specific behaviour which is responsible for the onset of three distinct mycelial phases. The three phases of nuclear behaviour are as under:

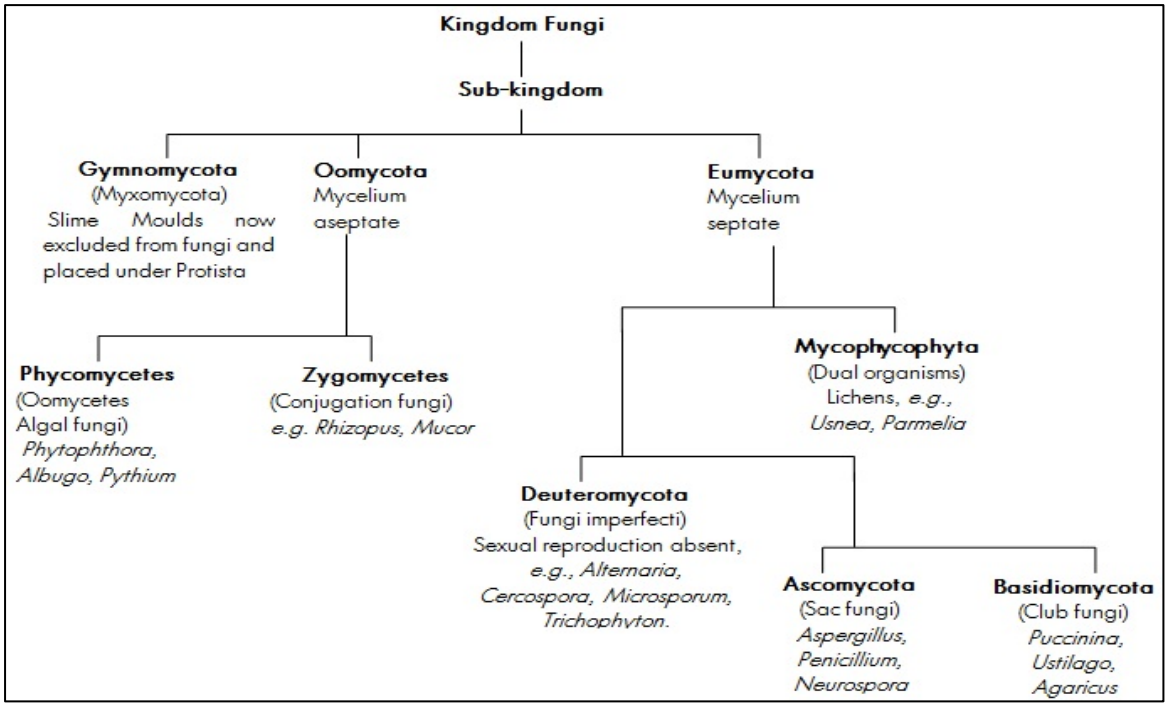
- **Plasmogamy:** Fusion of two protoplasts.

- **Karyogamy:** Fusion of two nuclei.

- **Meiosis:** The reduction division.



Classification of Fungi



Phycomycetes

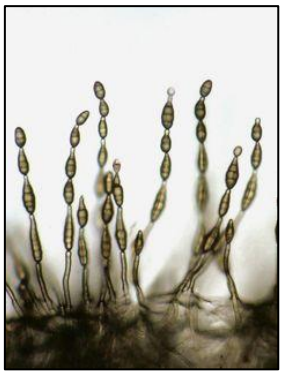
We can find these in aquatic habitats and on decaying wood in moist and damp places. The mycelium is aseptate and coenocytic. Asexual reproduction takes place by zoospores (motile) or by aplanospores (non-motile).

Rhizopus/Mucor

They are the cosmopolitan and saprophytic fungus, living on the dead organic matter. Rhizopus stolonifera occurs very frequently on moist bread. Hence, they are black bread mould.

Albugo

Albugo is a member of Phycomycetes. It is an obligate parasite and grows in the intercellular spaces of host tissues. It is parasitic mainly on the members of families Cruciferae, Compositae, Amaranthaceae and Convolvulaceae. The disease caused by this fungus is white rust or white blisters. The most common and well-known species is Albugo candida. It attacks the embers of the mustard family (Cruciferae).

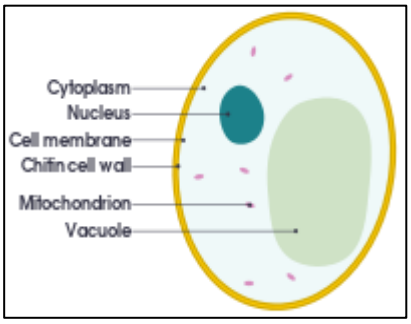


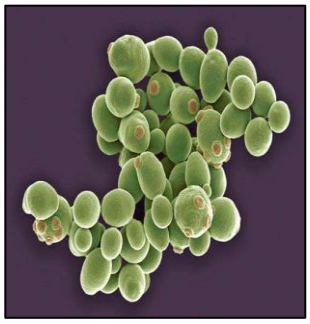
Ascomycetes

They are saprophytic, decomposers, parasitic or coprophilous (growing on dung). Some examples are Aspergillus, Claviceps and Neurospora. Neurospora is used extensively in biochemical and genetic work.

Yeast

Antony Von Leeuwenhoek in 1680 first described yeast. Yeast is nonmycelial or unicellular, which is very small and either spherical or oval in shape. Individual cells are colorless but the colonies may appear white, red, brown, creamy or yellow. Yeast reproduces by vegetative or asexual and sexual methods.





Basidiomycetes

The most common forms of basidiomycetes are puffballs, mushrooms and bracket fungi. They grow in soil, on logs and tree stumps and in living plant bodies as parasites, e.g., rusts and smuts. They have branched and septate mycelium. These organisms do not have sex organs. But, plasmogamy takes place by fusion of two vegetative or somatic cells of different strains or genotypes.