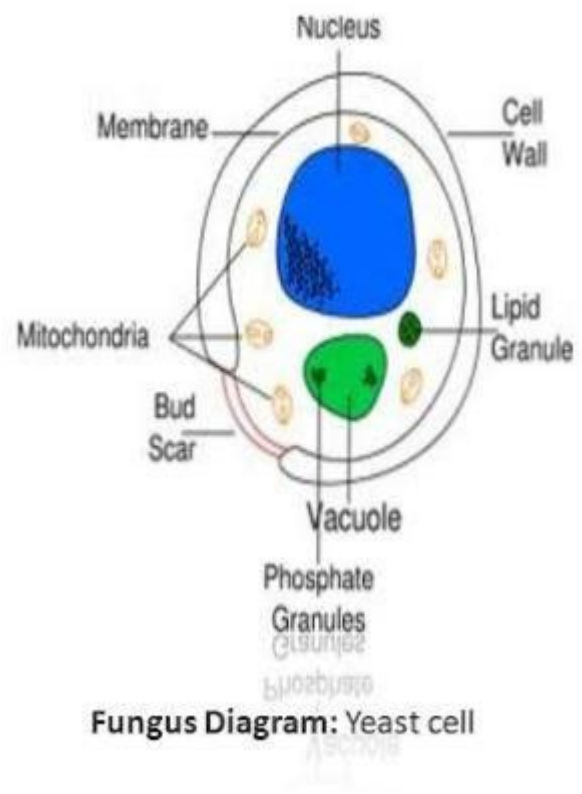


Introduction

- Fungi are **heterotrophic** organisms which means they require organic compound for nutrition or growth.
- Fungi are **spore-bearing** eukaryotes.
- Fungi may be unicellular or multicellular.
- Fungi includes **moulds** and **yeast**.
 - **Molds**– filamentous, multicellular.
 - **Yeast**– unicellular.
- Study of fungi is generally known as **mycology**.

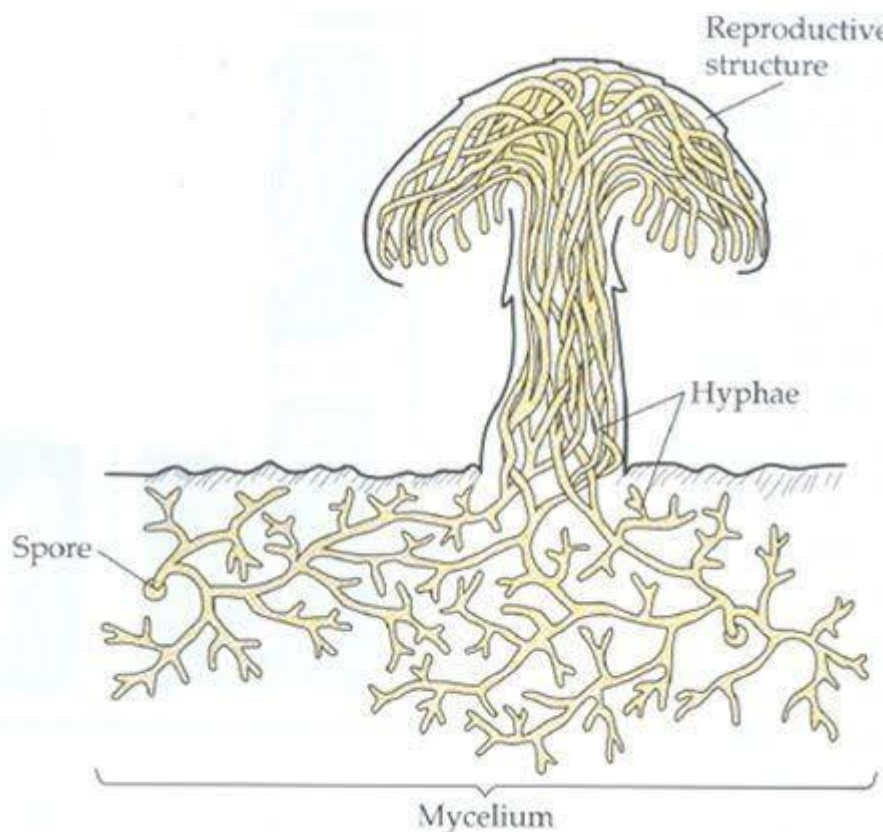


Distribution

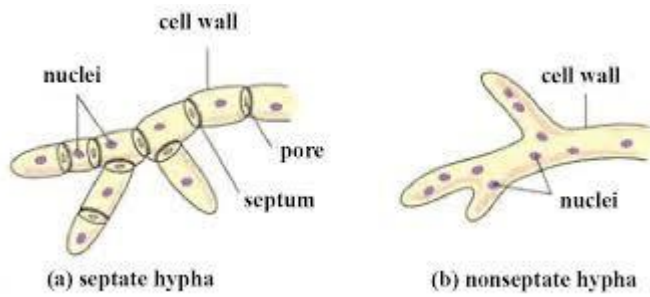
- The fungus occurs in all possible habitats i.e. aquatic, terrestrial (which grow in soil, on dead and decaying material).
- Some grow on plants and animals.
- Fungi also present in the air.
- In fungus chlorophyll are absent, so they depend on other for food. That is why fungi may be saprophytes, parasite or symbionts.

Morphology

- Yeasts cells are generally larger than most of the [bacteria](#).
- Size of yeast ranging from **1 to 5 micrometers** in width and from **5 to 30 micrometers in length**.
- Flagella or other organelles of locomotion are absent in yeast.
- Cell wall constituents of fungi are mainly **chitin** and **glucans**.
- Multicellular fungi are composed of networks of long filamentous branched structure called **hyphae**.
- The hyphae often aggregate in a thread like dense network known as **mycelium**.
- **The hyphae may be:**
 - Without crosswalls as in the case of lower fungi or, Divided into compartment by formation of septa in the higher fungi.



- **Hyphae occurs in three forms:**
 1. **Coenocytic** or **nonseptate**, such hyphae have no septa.
 2. Septate with uninucleate cells.
 3. Septate with multinucleate cells.



- The mycelium forms tissue like aggregates called the **plectenchyma**, in certain stages, often during transition to the sexual or asexual reproduction phase.

Reproduction of Fungi

In fungi, reproduction may be **asexual** or **sexual**.

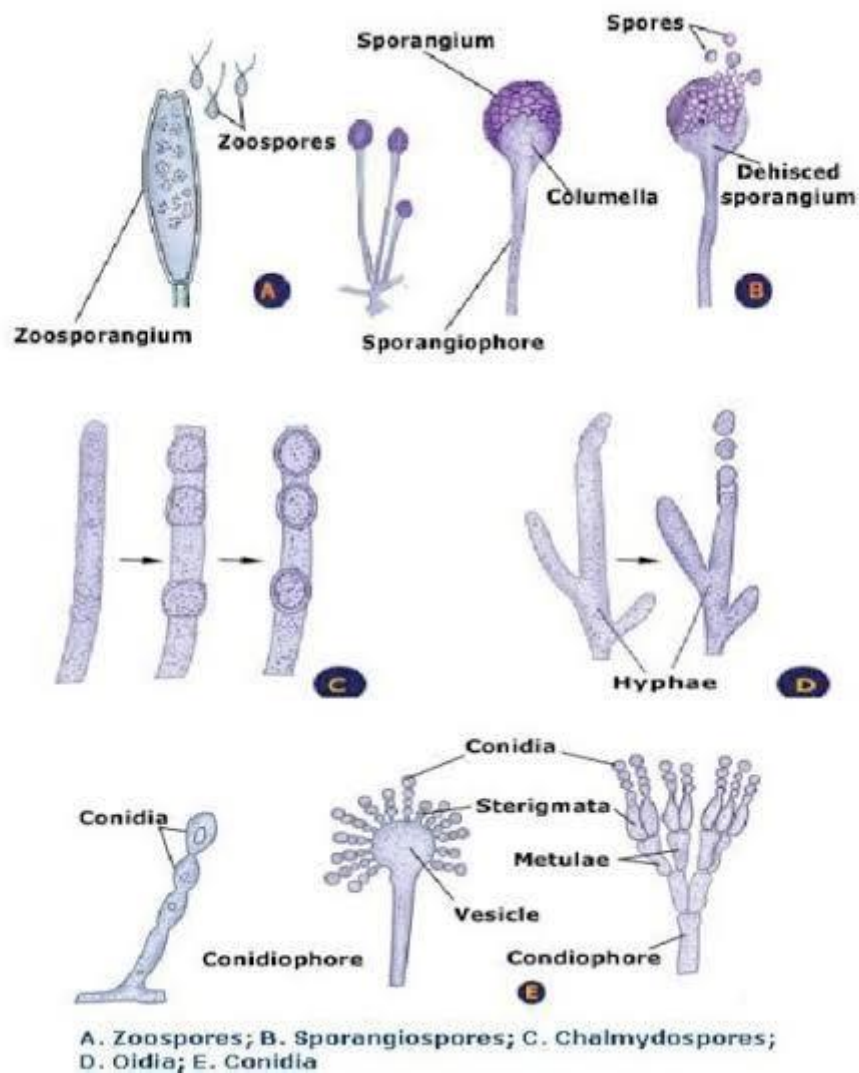
Asexual reproduction

- Asexual reproduction also known as **somatic** or **vegetative reproduction**.
- It does not involve the sex cells or sex organs and the union of nuclei.
- **Asexual reproduction maybe occurs by:**
 1. Fission of somatic cells.
 2. Budding of somatic cells or spores.
 3. Fragmentation or disjoining of the hyphal cells.
 4. Spore formation.

There are many kinds of asexual spores:

1. **Sporangiospores.**
2. **Conidiospores or conidia (conidium).**
3. **oidia(oidium), arthrospores.**
4. **Chlamydo spores.**

5. Blastospores.



Sporangiospores

- Single-celled spores.
- Formed at the end of hyphae within sacs **sporangia** or **sporangium**.
- **Aplanospores:** Non-motile sporangiospores.
- **Zoospores-** motile.
- **Example-** Mucor, Rhizopus.

Conidiospores or conidia (conidium)

- **Microconidia** is small and single-celled conidia.
- **Macroconidia-** large, multicellular conidia.
 - They are formed at tip or side of the hyphae.
- **Example-** penicillium, aspergillus.

oidia(oidium), arthrospores

- These spores are single-celled formed by fragmentation of hyphae cells.
- **Example**– In the the [milk](#) mould *Endomyces lactis*.

Chlamydospores

- These single-celled spores are surrounded by thick walls are highly resistant in adverse condition.
- These are formed by vegetative hypha cells.

Blastospores

- Through budding spores are formed.

Sexual reproduction

- It is carried out by fusion of genetic materials of two parent's cells.
- **Sexual reproduction can be divided into three phases:**
 1. **Plasmogamy**- Joining of two cells and fusion of their protoplast.
 2. **Karyogamy**- This involved fusion of two haploid nuclei.
 3. **Meiosis**- Reduction of chromosomes to the haploid number.
- **Gametangia**- The sex organelles of fungi (if present).
- **Antheridium**- Male gametangia.
- **Oogonium**- Female gametangia.

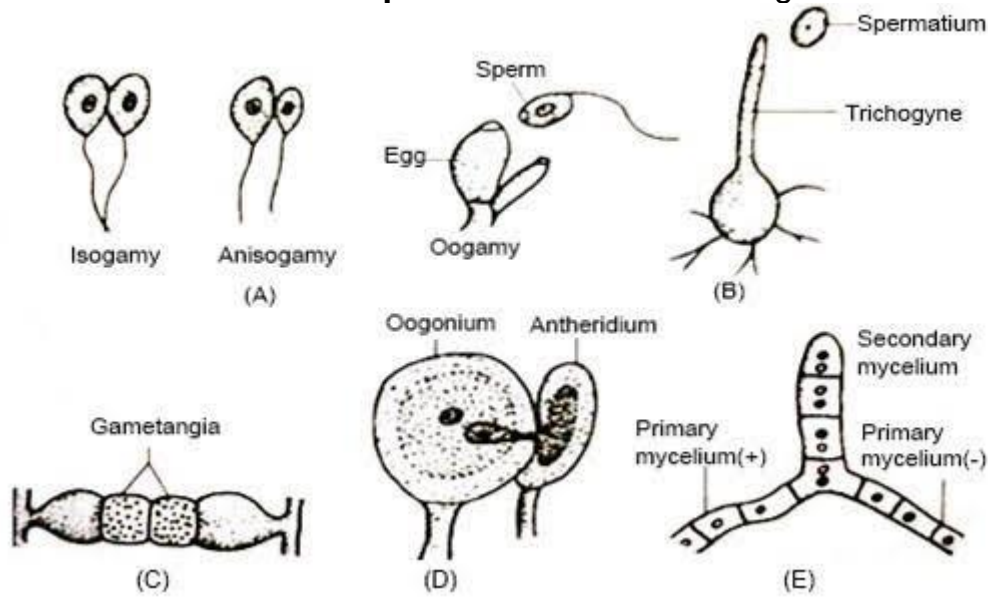
There are various types of sexual spores

- **Ascospores**- Single-celled produced in sac known as **Ascus**.
- **Basidiospores**- These spores are single celled and borne on a **club-shaped** structure known as basidium or basidia.
- **Zygospor**- are big in size, thick-walled spores formed by fusion of 2 sexually compatible hyphae or gametangia.
- **Oospores** formed within **Oogonium**, produced by fertilization of oospheres by male gametes.

Fruiting bodies

- Fruiting bodies are highly organised protective structure in which sexual and asexual spores may be surrounded.
- **Acervulus** and **pycnidium**- asexual fruiting bodies.

- **Perithecium** and **apothecium**- sexual fruiting bodies.



Classification

Fungi are classified in four major divisions:

1. **Chytridiomycota**
2. **Zygomycota**
3. **Ascomycota**
4. **Basidiomycota**

Chytridiomycota

- It is commonly known as **chytrids**.
- **Habitat**- Aquatic or terrestrial.
- **Ploidy**- Diploid.
- **Motile stage**- Present.
- **Asexual spores**- Holocarpic.
- **Pathogenic relationship**- Obligate parasite.

Zygomycota

- These are known as **zycomycetes**.
- **Habitat**- Terrestrial.
- **Ploidy**- Monoploid
- **Motile stage**- Absent.
- **Sexual spore**- Zygosporangia.

- **Asexual spore**– Sporangiospores/Chlamydo­spores.
- **Parasitic relationship**– Facultative parasite.
- **Example**– Black bread mould *Rhizopus stolonifer*.

Ascomycota

- Commonly known as **Ascomycetes** or **sac fungi**.
- **Habitat**– Terrestrial.
- **Ploidy**– Monoploid.
- **Motile stage**– Absent.
- **Sexual spore**– Ascospores.
- **Asexual spore**– Conidia.
- **Pathogenic relationship** is facultative or obligate.

Basidiomycota

- It is commonly Known as basidiomycetes or **club – fungi**.
- **Habitat**– Terrestrial.
- **Ploidy**– Monoploid, dikaryotic.
- **Motile stage**– Absent.
- **Asexual spore**– Arthrospores, oidia, conidia.
- **Sexual spore**– Basidiospores.
- **Pathogenic relationship** is facultative or obligate parasite.

Reference and Sources

- 1% – <https://www.slideshare.net/8275459522/mycology>
- 1% – <https://namspattoki.blogspot.com/2015/03/fsc-biology-part-1-first-five-chapters.html>
- 1% – <http://media-2.web.britannica.com/eb-diffs/357/222357-17869-110641.html>
- 1% – <https://www.sciencedirect.com/science/article/pii/B9780120884834500093>
- 1% – <https://softnotess.blogspot.com/2017/04/mic-210.html>
- 1% – <https://www.scribd.com/presentation/282239190/Fungi>