

Fungi are eukaryotes; they digest food from the outside and take in nutrients straight through their cell walls. Most fungi reproduce by sending out spores, and their bodies are made up of hyphae, which are tiny tubular cells. Fungi are heterotrophs, which mean they get their energy and carbon from **other living things**.

All fungi lead a heterotrophic existence as:

- ❖ **Biotrophs**: Fungi that get their food from a living host (plant or animal).
- ❖ **Saprotrophs**: Fungi that get their food from dead plants or animals (saprophytes, saprobes).
- ❖ **Necrotrophs**: These types of fungi infect a live host but kill host cells to get their food. They are called.

Reproduction:

The fact that fungi reproduce in a lot of different ways shows how different their lives and genetic makeup are. During a species' life cycle, reproduction can happen in two clear stages: the **teleomorph** (sexual reproduction) and the **anamorph** (asexual reproduction).

✚ Asexual reproduction

Vegetative seeds (conidia) or mycelial fragmentations are two ways that asexual reproduction can happen. When a fungus mycelium breaks up into

pieces, each piece grows into its mycelium, this is called mycelial fragmentation.

Sexual reproduction

Most fungal groups have been directly seen to reproduce sexually through meiosis. In many ways, it is not the same as sexual reproduction in plants or animals. There are also changes between fungal groups, and sexual structures and reproduction methods that are different from one species to another can be used to tell them apart.

Characteristics of Fungi

- Fungi are eukaryotic, non-motile and heterotrophic organisms.
- They may be **unicellular** or **multicellular**.
- They reproduce by means of **spores**.
- Fungi exhibit the phenomenon of **alternation of generation**.
- Fungi lack **chlorophyll** and hence cannot perform photosynthesis.
- Fungi store their food in the form of **starch**.
- The fungi have no embryonic stage. They develop from the **spores**.
- The mode of reproduction is sexual or asexual.
- Some fungi are **parasitic** and can infect the host.
- Fungi produce a chemical called pheromone which leads to sexual reproduction in fungi.

Fungal Morphology:

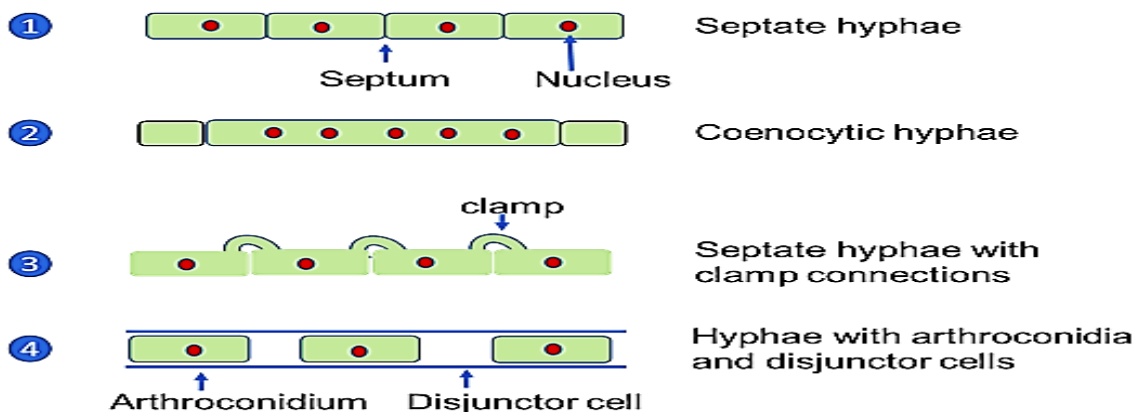
Fungi may be unicellular or multicellular, and morphology of fungi is either yeasts or molds. Moulds make hyphae, which are made up of many cells, while yeasts have only one cell and reproduce by splitting. In living things and in the lab, dimorphic fungi grow as yeasts or spherules at 37°C, but as moulds at 25°C.

✚ **Yeasts** are usually unicellular.

✚ **Molds**: multicellular organisms consisting of threadlike tubular structures called hyphae.

Types of hypha:

1. **Septate hyphae** (divided by partitions or crosswalls)
2. **Coenocytic hyphae** (without septum; hollow and multinucleate)
3. **Septate hyphae with clamp connection** (hyphal outgrowths form (clamp) - bypass around the septum to facilitate the migration of a nucleus).
4. **Hyphae with arthroconidia** (conidia produced by either a blastic (budding) process or a thallic process; hyphal segments fragment into individual cells or arthroconidia).



CLASSIFICATION OF FUNGI:

1) Class Ascomycetes:

One other name for them is sac fungi. Some types of them are parasitic, coprophilous, decomposers, and saprophytes. Ascospores are the name for the sexual seeds. Conidiospores are used for asexual generation, e.g. *Aspergillus* and *Penicillium*.

2) Class Basidiomycetes:

Mushrooms are the most commonly found basidiomycetes and mostly live as parasites. Sexual reproduction occurs by basidiospores. Asexual reproduction occurs by conidia, budding or fragmentation, e.g. *Cryptococcus*.

3) Class Deutromycetes: They are also known as "imperfect fungi" because they don't reproduce in the same way that other fungi do. They do not have sexual reproduction. Conidia are used for asexual generation, e.g. *Candida*.

4) Class Zygomycetes:

These are formed by the fusion of two different cells. The sexual spores are known as zygospores, while the asexual spores are known as sporangiospores. The hyphae are without the septa. Example – Mucor, e.g. *Rhizopus*,

Class of Fungi	Reproduction	Spore	Examples	Pathogenicity
Ascomycetes	Asexually	Conidiospores	Aspergillus	Aspergillosis
Basidiomycetes	Sexually	Basidiospore	Cryptococcus	Cryptococcosis
Deuteromycetes	Asexually	Thallospore	Candida	Most Mycoses
Zygomycetes	Both	Zygospore	Rhizopus	Mucormycosis
