

Classification of Fungi

The fungi are classified by two methods

1) **Morphological classification**

2) **Systematic classification**

1. **Morphological classification**: Morphologically all fungi divide into four group viz. (1) Mould (2) Yeast (3) Yeast like fungi and (4) Dimorphic fungi.

- 1) **Mould**: It is filamentous fungi and producing long hyphae which branch & form a network or mesh network known as mycelium. Ex- *Mucor*, *penicillium* etc.
- 2) **Yeast**: They are unicellular fungi & occur as single spherical cells. It has double cell wall and they reproduce by budding. Some yeasts are capsulated. Ex- *Cryptococcus neoformans*.
- 3) **Yeast like Fungi**: Grow partly as yeast and partly as long filamentous cells and form not true mycelium but “pseudomycelium” pseudomycelium is a weak structure and cannot exist as aerial mycelium while true mycelium is a continuous tube. Ex- *Candida albicans*.
- 4) **Diamorphic fungi**: They have got both yeast phase and mycelia phase in body tissues they grow as yeasts while in culture media 25° C they grow as filaments. In enriched medium like brain heart infusion agar at 37° C they grow as yeasts. Ex- *Histoplasma capsulatum*.

2. **Systematic Classification**:

The Systematic classification is based on the nature of sexual spores and according to this classification, the fungi are divided into 4 classes.

1. **Zygomycetes/Phycomycetes**: - The hypha is non septate. Sexual reproduction is by sexual fusion and production of oospore or thick walled zygospore. Sexual reproduction is by sporangiospores present in the sporangium. The fungi present in this class are pathogenic to plants & fish but fungi like *mucor* & *rhizopus* also pathogenic animals.
2. **Ascomycetes**: - The hypha is septate. Sexual reproduction is by oospores which are sexual spores and eight in number and present ascus. Reproduce asexually by Conidia arising from Conidiophore. Ex- *aspergillus*, *penicillium*, *Rhinosporidium*, *coccidioides*.
3. **Basidiomycetes**: - The hypha is septate. Sexual fusion results a club shaped organ basidium on the top of which 4 basidiospores are present and reproduction is by basidiospores. They are mostly fungi of plants. Ex- Mushroom, Toad stools.
4. **Deuteromycetes**: - Deuteromycetes are also known as ‘Fungi Imperfecti’ because of absence of sexual reproducing forms (Teleomorph or perfect stage). As their

teleomorph continue to be discovered, they would be classified among the previous

categories (Ascomycetes), until then this remains an artificial and heterogeneous group. E.g., *Histoplasma*, *Candida* etc.

The ability of pathogenic fungi to switch between a multicellular hyphal and unicellular yeast growth form is a tightly regulated process known as **dimorphic switching**. Dimorphic switching requires the fungus to sense and respond to the host environment and is essential for pathogenicity.