

Fungi: characteristics and classification of Fungi.

Characteristics of Fungi

1. Fungi is a separate kingdom
2. Fungi are Eukaryotic organism
3. Morphology:

Fungi exists in two fundamental forms, filamentous or hyphal form (MOLD) and single celled or budding form (YEAST).

But for the classification of fungi, they are studied as mold, yeast, yeast like fungi and dimorphic fungi.

Yeast is Unicellular while Mold is multicellular and filamentous

4. Fungi lacks Chloroplast.

5. Mode of nutrition:

Fungi are organotrophic heterotrophs.

Mostly Fungi are saprophytic and some are Parasitic

6. Fungi grow best in acidic environment (tolerate acidic pH).

7. Fungi can tolerate high sugar concentration and dry condition

8. Most of the fungi are Obligate aerobes (molds) and few are facultative anaerobes (yeasts)

9. Optimum temperature of growth for most saprophytic fungi is 20-30 C while (30-37) C for parasitic fungi.

10. Growth rate of fungi is slower than that of bacteria.

11. Cell wall is composed of chitin

12. Cell membrane consists of ergosterol

13. Reproduction: both asexual (Axamorph) and sexual (Teliomorph) mode of reproduction

Asexual methods: fragmentation, fsomatic budding, fission, asexual spore formation

Sexual methods: gametic copulation, gamate-gametangium opulation, gametangium copulation, somatic copulation and Spermatization.

14. More than 2,00,000 fungi species are known.

15. More than 100 fungi are responsible for human infection.

16. More than 20 species are responsible to cause severe systemic human infection, 35 species causes less severe systemic disease or might causes cutaneous or sub cutaneous infection and 45 species causes superficial cutaneous infection.

17. Some fungi shows mutualistic relationship with higher plants, eg Mycorrhiza is symbiotic associated with root of gymnosperm

Classification of fungi:

The kingdom fungi or mycota is classified into 9 division however only four division are involved in medical mycology

1. Ascomycetes
2. Basidiomycetes
3. Zygomycetes
4. Deuteromycetes

Ascomycetes:

Sexual spore produced within a sac like structure called ascus.

Sexual spore are called ascospore

Asexual reproduction occurs by single celled or multi celled conidia

Ascomycetes are also known as sac mycetes.

Hyphae are generally septated

Examples: Saccharomyces, Arthroderma, Gibberella

Basidiomycetes:

Sexual spore are produced externally on a basidium

Sexual spore are known as basidiospore

Asexual reproduction occurs by budding, fragmentation or conidia formation

They are commonly called as mushroom group

Hyphae are generally septated

Examples: Amanita, Agaricus,
Filobasidiella

Zygomycetes:

Sexual spore are known as Zygosporangium

Zygosporangium is formed by fusion of two similar cells.

Asexual reproduction occurs by
sporangiospore

Hyphae are generally aseptate.

Examples: Rhizopus, Mucor,
Basidiobolus, Conidiobolus

Deuteromycetes:

No sexual stage is present

Deuteromycetes are also known as fungi imperfecti.

Asexual reproduction occurs by means of conidia.

Most of the human and animal pathogens are present in this class.

Examples: Candida, Cryptococcus, Trichophyton, Epidermophyton, Histoplasma

Importance of fungi:

- i. Important agents for biodegradation and bio-deterioration
- ii. Use in industrial fermentation process.

Examples; *Penicillium notatum* is used for production of penicillin antibiotics

Aspergillus niger is used for production of citric acid

Saccharomyces cerevisiae is used for alcohol production

iii. Used in bioremediation (reduces toxic concentration)

iv. Used in agriculture, horticulture and forestry, example; biofertilizer and biopesticides

