

Subject-Botany

By-Dr. Deepti Sharma

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Paper-1(Diversity of virus, Bacteria and Fungi)

Topic- Characteristic features of Classification of Fungi

Ascomycotina

Important characteristics:

1. Vegetative body is unicellular or commonly well developed, branched septate mycelium with uni- or multinucleate cells having perforated septa.
2. Mostly, the cell wall is composed of chitin and glucans, but in unicellular form, it is composed of glucans and mannans.
3. Vegetative reproduction takes place by fragmentation (in filamentous form), fission and budding (in unicellular form).
4. Asexual reproduction takes place by non-motile spores, such as conidia, oidia and chlamydospores.
5. Sexual reproduction takes place by gametangial copulation (Saccharomyces), gametangial contact (Penicillium), somatogamy (Morchella) or spermatization (Polystigma).
6. Complete absence of motile structures.
7. The product of sexual reproduction is the ascospores grown inside a small specialised sac-like structure, called ascus.
8. The fruit bodies (inside which ascus developed) are the ascocarps. The asco- carps may be cleistothecium (Penicillium), apothecium (Ascobolus), perithecium (Daldenia) or ascostroma (Elsinoe veneta).

Common genera:

Saccharomyces, Penicillium, Daldenia, Ascobolus, Morchella etc.

Basidiomycotina

Important characteristics:

1. Presence of well-developed, branched and septate mycelium having simple (e.g., Ustilaginales and Uredinales) or dolipore (e.g., Auriculariaceae, aphyllophorales and Agaricales) septum .

2. The mycelial cells contain one nucleus, called monokaryotic i.e., primary mycelium or two nuclei, called dikaryotic i.e., secondary mycelium. The secondary mycelia may organise and form fruit body, called tertiary mycelium.

3. The cell wall is mainly composed of chitin and glucans.

4. Reproduction

(a) Vegetative reproduction takes place by budding and fragmentation.

(b) Asexual reproduction takes place by conidia, oidia or chlamydospores. This is lacking in some higher taxa of this subdivision.

(c) Sex organs are absent. During sexual reproduction, the dikaryotic cell is formed by somatogamy, spermatization or by buller phenomenon. The dikaryotic phase persists for long period of time. Karyogamy occurs in basidium mother cell and forms diploid nucleus, which is ephemeral (short lived). 4-haploid basidiospores are formed by meiosis. Basidiospores are developed exogenously on the horn-shaped structure, the sterigmata (generally 4) on the basidium.

5. Basidia are of two types: Holobasidium (aseptate) e.g., Agaricus, Polyporus and Phragmobasidium (septate) e.g., Puccinia, Ustilago .

6. Except in lower forms (Puccinia, Ustilago), secondary mycelia by aggregation form fruit body, the basidiocarp [Agaricus, Polyporus etc.]. The number of spores' on each basidium is commonly 4, but 2 or more than 4 are also present.

Common genera:

Agaricus, Polyporus, Puccinia etc.

Zygomycotina

Important characteristics:

1. The thallus is normally haploid, consisting of coenocytic mycelium and its wall contains chitin.
2. The mycelium contains cell organelles like other fungi, except typical golgi bodies and centriole.
3. Asexual reproduction takes place by aplanospores.
4. Sexual reproduction takes place by gametangial copulation results in the formation of zygospore.

Common genera:

Mucor, Rhizopus

Mastigomycotina

Important characteristics:

1. Zoospores uniflagellate.
2. Flagellum posteriorly placed and whiplash type ... Chitridiomycetes.

3. Flagellum anteriorly placed and tinsel type ...
Hyphochytridiomycete.

4. Zoospores biflagellate (one whiplash and other one tinsel type)...Oomycetes.

Deuteromycotina

Important characteristics :

1. The members of this group are either saprophytes or parasites.
2. The vegetative body is mycelial and composed of profusely branched and septate hyphae with perforated septa and their cells are usually multinucleate.
3. In parasitic species, the hyphae grow intra- or intercellularly.
4. They reproduce only by asexual methods and the sexual stages are not known.
5. The asexual reproduction takes place commonly by conidia, or by blastospores, chlamydospores and arthrospores. The conidia are developed exogenously on conidiophores.

The conidiophores are either free or grouped together to form specialized structures, such as synnemata (sing, synnema) and sporodochia (sing, sporodochium) or produced in fructification known as acervuli (sing, acervulus) or pycnidia (sing, pycnidium).

6. Many genera of the class exhibit genetic variation as a result of heterokaryosis and parasexuality.