

Paper: BOT-HC-2016

Topic: Thallus Organization of Fungi

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❖ Thallus Organization of Fungi

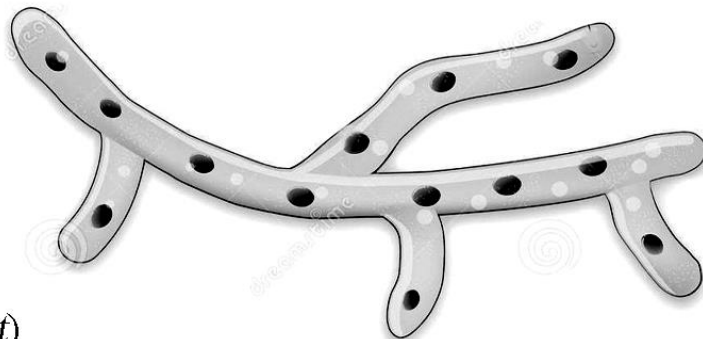
Vegetative body of fungi may be as simple as unicellular thallus or in majority the body is made up of long and slender filaments called **hyphae**.

Type 1. Unicellular Thallus :

In some of the lower fungi such as the Chytrids and Yeasts, the thallus is more or less a spherical, single-celled structure . At the time of reproduction, it becomes a reproductive unit.



Unicellular thallus (*Yeast*)



Filamentous thallus (*Mucor*)

Q. What is holocarpic fungi. Give an example.

Type 2. Filamentous Thallus :

The vast majority of the fungi have a filamentous thallus. It originates through the germination of a spore. The spore germinates as it lands on a suitable

substratum/host and under favorable conditions grows into fluffy thallus of cottony mass and tubular structures called as **hyphae**. It elongates by apical growth.

Collectively the hyphae intertwine to form the vegetative body of the fungi called **mycelium**. The hypha is thus a structural unit of the mycelium. It consists of a thin, transparent wall filled or lined with a layer of cytoplasm.

Q. What is eucarpic fungi. Give example.

Mycelium: Mycelium is the food absorbing structure of the fungi. It carries on the general activities of a plant cell such as absorption, digestion, respiration, excretion and growth but not photosynthesis. It is a multinucleate structure which lacks complete internal boundaries.

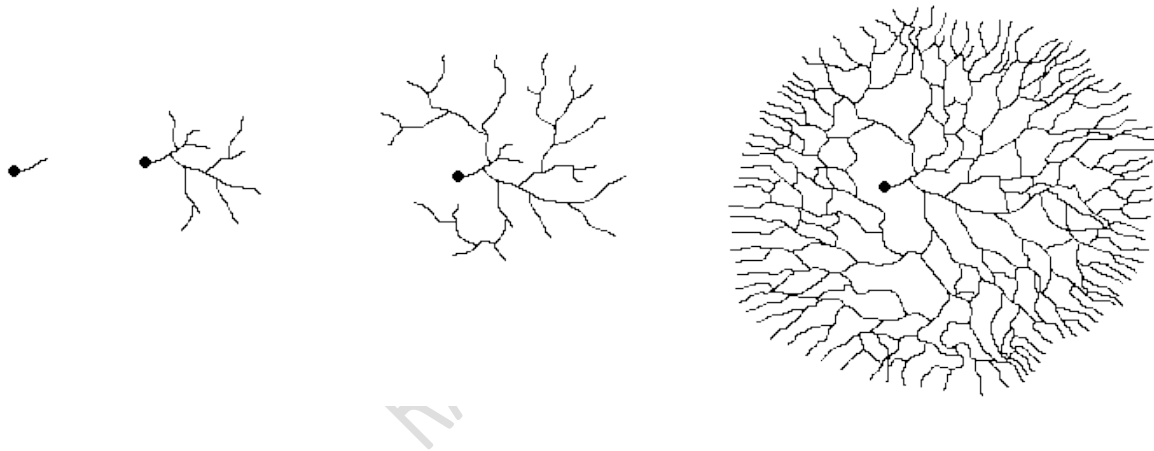


Fig: Formation of mycelium from hyphae.

The fungal mycelium is of two types-

- i) Aseptate
- ii) Septate

- i) **Aseptate:** The protoplasm is continuous without being interrupted by cross walls i.e., lacks internal partition. They are multinucleated continuous mass of hyphae and are so called as Coenocytic. It grows terminally by the apical elongation. It is found in class Phycomycetes.

- ii) **Septate:** Development of cross walls i.e., partitions during meiosis and mitosis as a result the hyphae becomes divided into cellular structure. They are uninucleate or multinucleate. Each division is called as *Septa* which can be porous or non porous. In porous septa pores are present through which the cytoplasmic contents pass from one cell to the another.

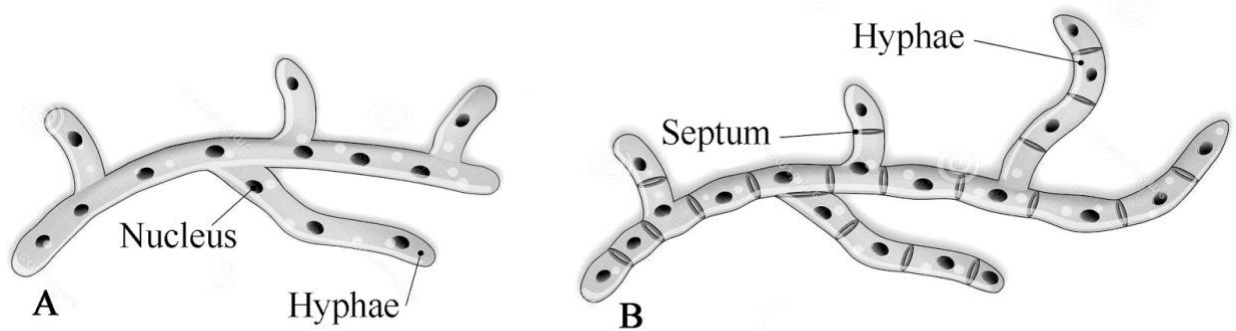


Fig: (A) Aseptate (coenocytic hyphae) and (B) Septate hyphae

Q. Describe monokaryotic and dikaryotic mycelium.

Modifications of hyphae i.e., Organisation of the mycelium

Seven different types of modifications of hyphae mycelium with their diagrams.

The types are:

1. Plectenchyma
2. Rhizomorph
3. Sclerotium (Pl. Sclerotia)
4. Stroma (Pl. Stromata)
5. Pseudosclerotium (pl. pseudosclerotia)
6. Appressorium (pl. Appressoria)
7. Haustorium (pl. Haustoria).

1. Plectenchyma :

A false tissue formed by aggregation of hyphae is known as Plectenchyma. All fungal tissues come under this general term. When hyphae grow together, inter

twine and become organized into loosely or compactly woven massive tissues it is called *plectenchyma*. It may be of two types:-

a) Prosenchyma or Prosoplectenchyma:

It is rather a loosely woven tissue of hyphae. The hyphae- composing it do not lose their identity. They run more or less parallel to one another and are composed of elongated cells.

(b) Pseudoparenchyma or Paraplectenchyma:

In the fructifications of higher fungi, the hyphae become woven and intertwined into a compact mass. The hyphal individuality is lost, as a result hyphal cells are not distinguishable.

As a result, the hyphal mass appears to be continuous structure consisting of isodiametric or oval cells. It bears a striking superficial resemblance to the parenchyma tissue of the higher plants and is called pseudoparenchyma.

2. Rhizomorph:

A thick strand or root like aggregation of somatic hyphae is called Rhizomorph. The hyphae lose their identity and individuality and the whole mass behaves as an organised unit. It is believed that rhizomorph has a higher infection capacity than individual hyphae. Examples of Rhizomorphs are found in *Armillariella mellea*.

Q. Write briefly about the rhizomorph.

3. Sclerotium (pl. Sclerotia):

They are composed of pseudoparenchyma cells and store food and outer cells are thick walled, dark brown or black crust like. Structurally rounded and cushion shaped tough and resting bodies. It may survive for long periods of time. The sclerotia usually germinate to form hyphae or may form reproductive structures. Sclerotia are commonly formed in *Claviceps purpurea*, *Rhizoctonia solani* and *Macrophomina phaseoli*.

4. Stromata:

Any fungal tissue that forms reproductive structures are called Stromata. These are compact somatic structures like mattresses. Example: *Daldinia* sp.

5. Pseudosclerotium (pl. pseudosclerotia):

These sclerotia like bodies are formed at the base of various fruit bodies of higher fungi. E.g., *Polyporus basilapiloides*

6. Appressorium (pl. Appressoria):

These are common in parasitic fungi mostly ectoparasites. An appressorium is a terminal simple or lobed swollen structure of germ tubes or infection hyphae. It adheres to the surface of the host and helps in the penetration of hyphae of the pathogen. Appressoria are commonly formed by the parasitic members of the order Erysiphales.

7. Haustorium (pl. Haustoria):

These are mostly produced as intracellular absorbing structures of obligate parasites. Haustoria are usually produced in those fungi in which intercellular mycelium are found. They vary in shape and may be knob shaped or branched finger shaped.

They secrete certain specific enzymes which hydrolyse the proteins and carbohydrates of the host cell and thus they absorb nutrients from the host without killing it. Haustoria also provide a greater surface area for the exchange of materials.

References

- (i) Studies in Botany Vol. I
- (ii) S.Chand ., Botany for Degree students (Fungi)
- (iii) www.google.com