

(ii) **Secondary mycelium:** It is a dikaryotic hypha that originates from the primary mycelium. It is formed by dikaryotization process. Dikaryotization occurs in various methods: like conjugation between two basidiospores or by fusion of spermatia of two opposite strains of primary mycelia, or by fusion of two opposite primary mycelia or through Buller's phenomenon.

These mycelia are dikaryotic (each cell with 2 nuclei) and heterokaryotic (the nuclei of each cell are of different strains).

(iii) **Tertiary mycelia:** These are also dikaryotic in nature and form the fruiting bodies (basidiocarp).

**4. Dolipore septa:** Each cell of the monokaryotic and dikaryotic hyphae are separated from the neighbouring cells by septa called **dolipore septa**. Dolipore septum is an incomplete septum that contains a central pore that permits cytoplasmic continuity between adjacent segments. The septal pore is surrounded by a barrel-shaped flange of thickened wall material. The main function of dolipore septum is to maintain cytoplasmic continuity between cells and protecting the cells by plugging the pore in case of any harm or danger to a cell.

**5. Clamp connections:** Clamp connections are the bypass methods by which the dikaryotization of cells of a monokaryotic hypha takes place. If a cell of the monokaryotic hypha fuses with another primary monokaryotic hypha one cell becomes dikaryotized. This cell subsequently dikaryotizes the consecutive neighbouring cell through a clamp connection and this process of dikaryotization goes on:

(i) When a dikaryotic cell is ready to divide, a pouch like outgrowth arises from its wall at a point midway between the two nuclei of the dikaryotic cell (dikaryon). (Fig. 6.2)

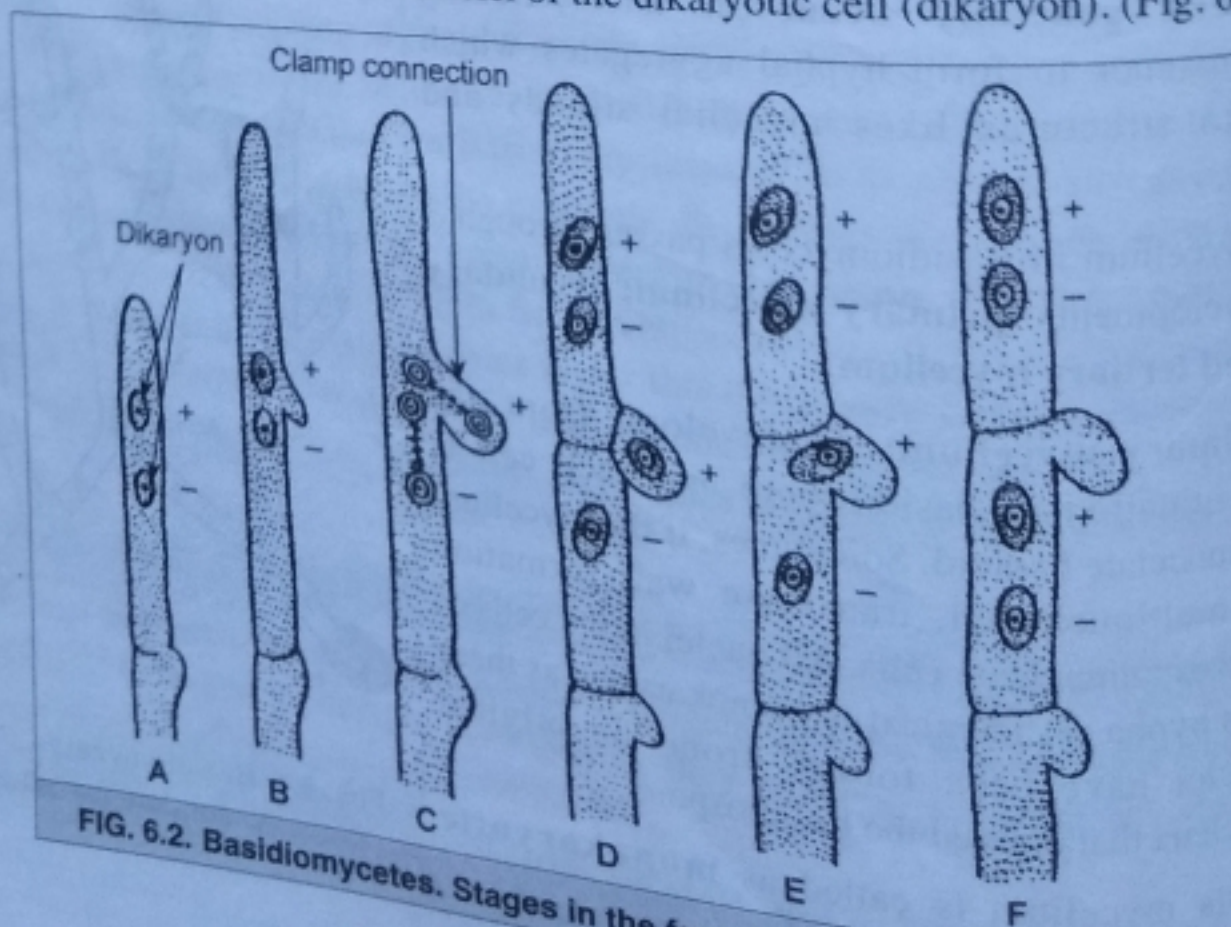


FIG. 6.2. Basidiomycetes. Stages in the formation of clamp connection.

- (ii) The two nuclei of the cell then divide simultaneously called as **conjugate** division.
- (iii) One daughter nucleus of the upper pair passes into the pouch followed by a septum formation at the base of the pouch. The pouch is now cut off from the main cell and is known as **clamp cell**.
- (iv) This clamp cell now grows to a hook like structure and touches the wall of the adjoining cell.
- (v) The wall between the pouch and the cell now dissolves and the nucleus of the clamp cell migrates into it making it dikaryotic.
- (vi) The process is repeated and each time a clamp is formed.

This method was first discovered by **Hoffman in 1856**. Clamp connection is a method to ensure formation of a dikaryotic cells with two genetically distinct nuclei during cell division in a mycelium. Generally the first clamp is formed in the terminal cell. Both the cells contain two nuclei but their arrangement has been reversed in the newly formed dikaryotic cell.

## B. Asexual Reproduction

Asexual reproduction by means of spores has no significant role in the life history of Basidiomycetes. Conidia formation in this group is less common than in Ascomycetes. However they are formed in monokaryotic, dikaryotic or even both types of hyphae which help in propagation and dispersal. They may also form a basidiocarp.

In terms of structure and ontogeny, there are three basic kinds of conidia in Basidiomycetes: Oidia (Arthroconidia), blastic conidia and chlamydospores.

(a) **Oidia**. Oidia are small, hyaline, thin walled, unicellular, structures. They are uninucleate. Oidia may develop on monokaryotic or dikaryotic mycelia but the oidia formed on dikaryotic hyphae are monokaryotic and developed by the process of **dedikaryotization**.

Oidia may be **wet type** which are formed at the tips of oidiophores. They join with each other to form a sticky globule.

**Dry type** oidia develop usually as chains of cylindrical arthroconidia.

Oidia formed on monokaryotic mycelia normally function as spermatia and help in spermatization on during sexual reproduction.

(b) **Blastic conidia** are formed on the conidiophores and liberated by a blowing out mechanism. They can develop on germinating basidiospores or on monokaryotic mycelia.

(c) **Chlamydospores**. These are unicellular spores formed in some mushrooms and bracket fungi. They are also formed as intercalary chlamydospores in the mycelium inside the substrate.

(d) **Bulbils**. Certain basidiomycetes develop multicellular, pseudoparenchymatous propagules composed of thin walled, undifferentiated homogenous cells in the form of bulbils and vegetatively propagate through them.