

## Fungal cell division:

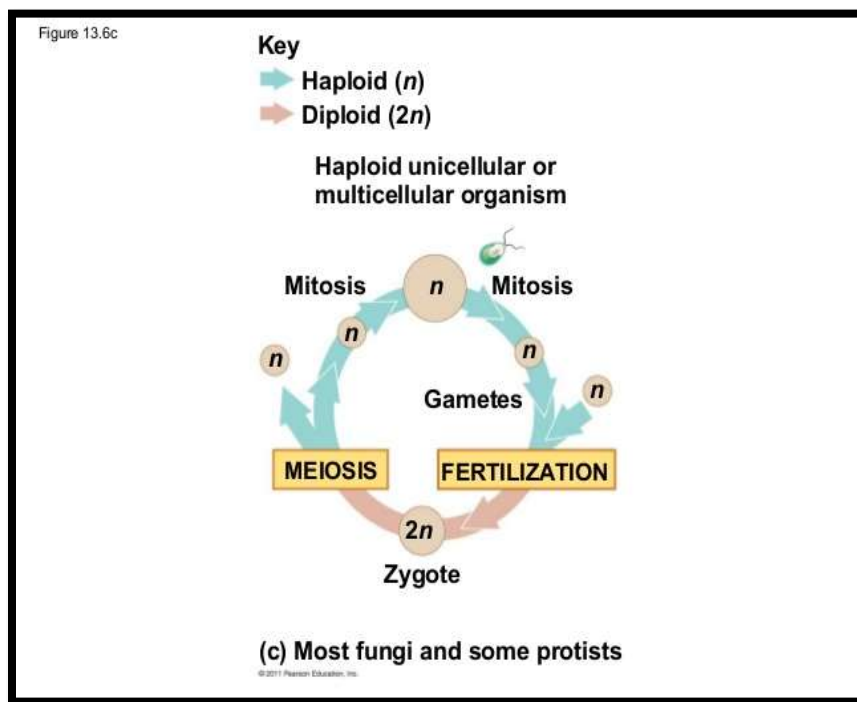
**Cell division:** an important characteristic of living cells is their ability to divide, so cell division is happened in all living organism.

There is two kinds of division: mitosis and meiosis.

**Mitosis** is the process of one cell dividing into two daughters, such that each inherits a single and complete copy of the genome of their mother. This is achieved through the equal segregation of the sister chromatids between the daughter cells.

- In multicellular fungi mitosis permits growth and repair of tissues.
- In unicellular fungi mitosis is a form of asexual reproduction.

**Meiosis** produces specific types of reproductive cells. In animals, meiosis occurs in the gonads (ovaries/testes) and produces eggs or sperm. In plants and fungi, meiosis produces other reproductive cells called spores. Spores do not fuse; a spore is a single reproductive cell that simply begins to divide and grow on its own to become an offspring.



## Reproduction:

Fungi reproduce sexually and/or asexually. Perfect fungi reproduce both sexually and asexually, while imperfect fungi reproduce only asexually (by mitosis).

In both sexual and asexual reproduction, fungi produce spores that disperse from the parent organism by either floating on the wind or hitching a ride on an animal. Fungal spores are smaller and lighter than plant seeds. The giant puffball mushroom bursts open and releases trillions of spores. The huge number of spores released increases the likelihood of landing in an environment that will support growth.

### Asexual reproduction in fungi:

- ❖ fission of somatic cell
- ❖ Budding of somatic cell
- ❖ Fragmentation or disjoining of hyphae
- ❖ Asexual spore formation

#### 1. Fission:

In binary fission a mature cell elongates and its nucleus divides into two daughter nuclei. The daughter nuclei separate, cleave cytoplasm centripetally in the middle till it divides parent protoplasm into two daughter protoplasm. A double cross wall is deposited in the middle to form two daughter cell. Ultimately the middle layer of double cross wall degenerates and daughter cells are separated.

Examples: *Saccharomyces pombe*, *Psygosaccharomyces*

#### 2. Budding:

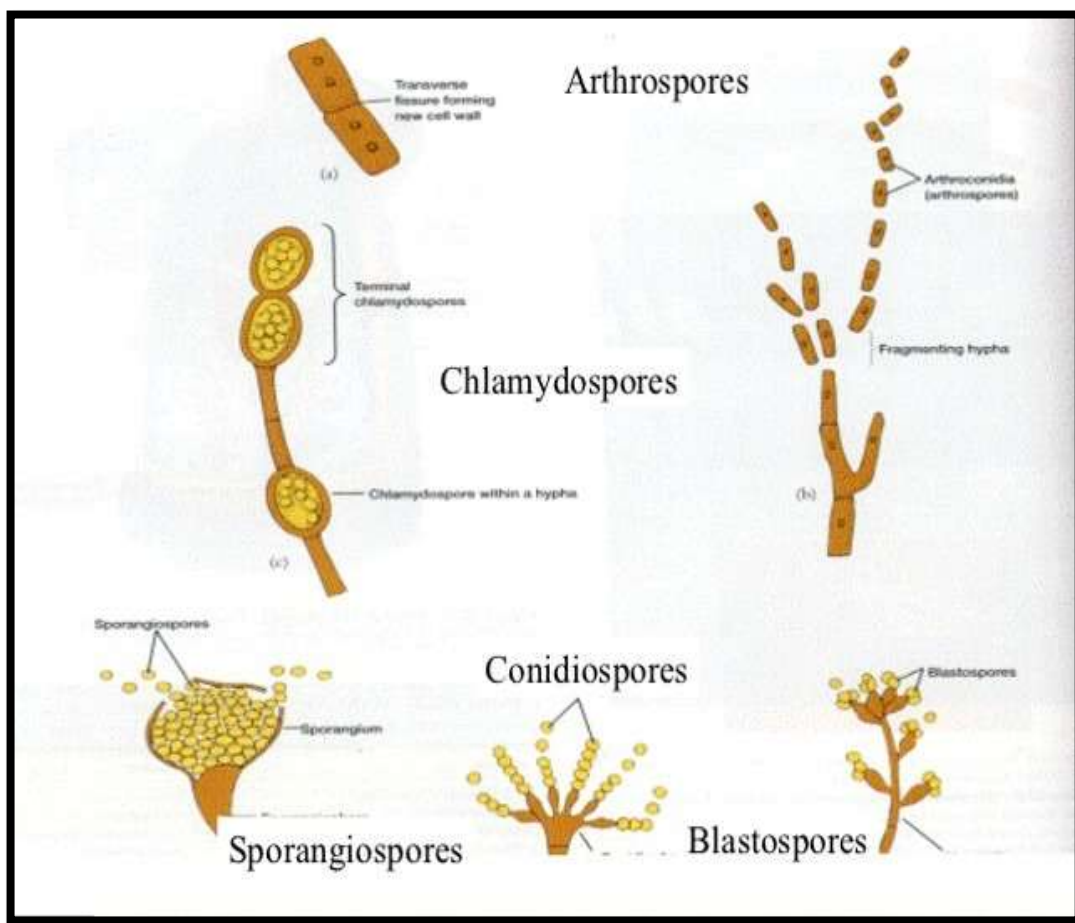
The cell wall bulge out and softens in the area probably by certain enzymes brought by vesicles. The protoplasm also bulge out in this region as small protuberance. The parent nucleus also divides into two, one of the daughter nucleus migrates into bud, the cytoplasm of bud and mother remain continuous for some time, As the bud enlarges, a septum is laid down at the joining of bud with mother cell. Then bud separates and leads independent life. Some time, bud starts reproducing while still attached with mother cell. This gives branching appearance. Budding is the typical reproductive characteristics of Ascomycetes. Examples: yeast

### 3. Fragmentation:

In some fungi, fragmentation or disjoining of hyphae occurs and each hyphae become a new organism.

### 4. formation spore of fungi:

Spore formation is the characteristic feature of fungi. Different fungi forms different types of spore .



## Sexual reproduction in fungi:

Sexual reproduction is carried out by diffusion of compatible nuclei from two parent at a definite state in the life cycle of fungi.

The process of sexual reproduction involves three phases:

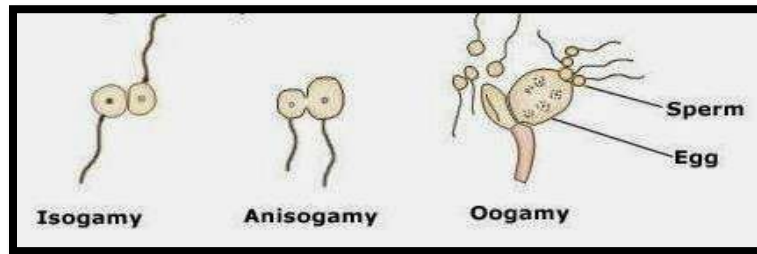
- Plasmogamy: fusion of protoplasm
- Karyogamy: fusion of nucleus
- Meiosis: reductional nuclear division

Various methods by which compatible nuclei are brought together in plasmogamy. Some are:

### 1- Gametic copulation

Fusion of two naked gametes, one or both of them are motile

- Isogamous
- Anisogamous
- Oogamous



### 2- Gamete-gametangial copulation

- Male and female gametangia comes into contact but do not fuse.
- A fertilization tube formed from where male gametangium enters the female gametangium and male gamete passes through this tube.

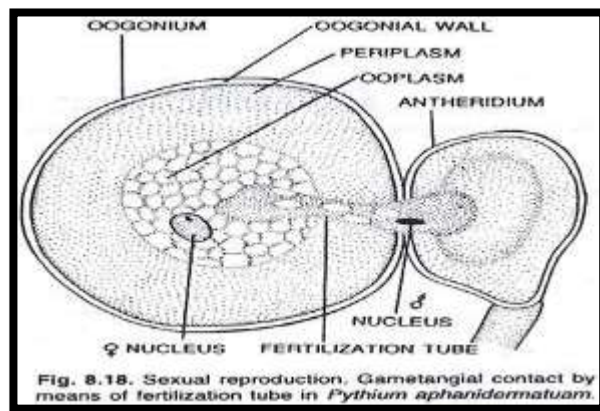
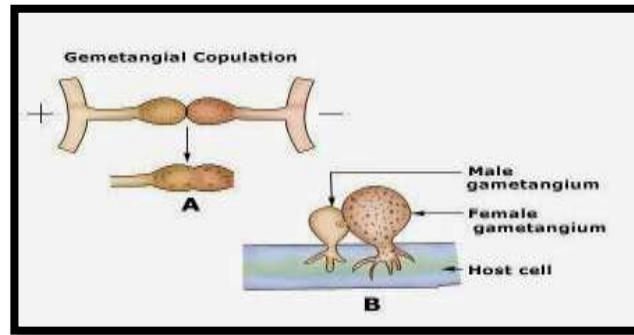


Fig. 8.18. Sexual reproduction, Gametangial contact by means of fertilization tube in *Pythium aphanidermatum*.

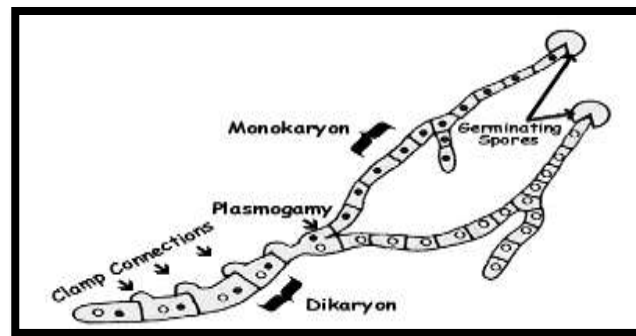
### 3- Gametangial copulation

- Two gametangia or their protoplast fuse and give rise to zygospore



### 4- Somatic copulation

- Also known as somatogamy.
- In this process fusion of somatic cell occurs
- This sexual fusion of undifferentiated vegetative cells (monokaryons) results in dikaryotic hyphae, so the process is also called dikaryotization.



### 5- Spermatization :

- It is an union of special male structure called spermatia with a female receptive structure.
- Spermatium empties its content into receptive hyphae during plasmogamy

