

Chlamydo-spores: (Fig. 1.20) Such spores are formed by rounding off of the contents of two or more hyphal segments. They are difficult to detach from fungal mycelium, thick walled and rough structures remain dormant for long time some times upto many years.

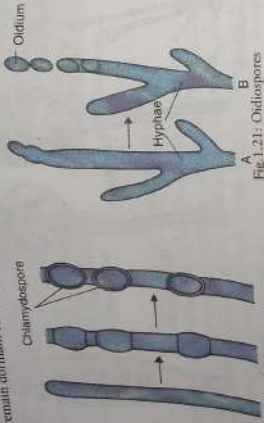


Fig. 1.20. Chlamydo-spores

Oldiospores: (Fig. 1.21) Spores produced under artificial laboratory conditions. Fungal hypha becomes beaded because of segmentation of hyphae, e.g. *Penicillium* sp.

Sexual Reproduction:

Sexual reproduction in fungi like any other organisms, involve three steps : Plasmogamy (fusion of cell), karyogamy (fusion of nucleus) and meiosis. Two haploid cells of genetically different, strain fuses to form a dikaryotic cell then karyogamy takes place to develop diploid state of life cycle. Meiosis finally restores the haploid state of the fungus during sexual reproduction. In aquatic fungi fertilization takes place by fusion between free living gametes or free living gametes with gametangium is common. In other form of fungi where gametangia either differ in form and function (oogonia and antheridia) or in size only or even none at all. In most of the fungi, anastomosis (fusion of fungal tips) is common for fertilization. Meiosis, thereafter, confers to specialized cell structure, frequently followed by spore production from it or in apothecium form, its equivalent without meiosis. Two such specialized cell structures are the Ascus in Basidiomycetes producing somewhat oval shaped Ascospores and Basidiospores respectively. Ascospores the four nuclei derived from meiosis in ascus undergo further mitotic division to produce eight ascospores endogenously. These ascospores are subsequently released from the ascus, similarly in Basidiomycetes nuclear fusion is followed by meiosis but here the basidiospores generally develop immediately after meiosis at the tip of four tapering sterigmata. Thus the Basidiospores develop exogenously from one basidium. Basidiospores are said to be discharged violently from Basidium.

LIFE CYCLE IN FUNGI

Raper (1954) has originally described seven type of life cycle in fungi that has been related to five basic life cycles (Burnett, 1976). They are

1. Asexual Life Cycle : Where sexual reproduction is apparently lacking entirely. As describe in many fungi belonging to deuteromycetes.
2. Haploid Life Cycle: Where diploid phase is of minimal duration. Meiosis immediately follows nuclear fusion and the mitotic products are dispersed. Such life cycles are found in most Phycomycetes and few Ascomycetes.



REPRODUCTIVE PHASE

When the organism has reached a certain stage of maturity and has accumulated enough food it starts reproducing. Reproduction involves the production of new individuals resembling the parent or parents. In fungi, reproduction is of three kinds, vegetative, asexual and sexual. Most mycelium, however, undergoes asexual reproduction (vegetative and spore formation) which do not involve union of nuclei or sex cells or sex organs other than trichia or asexual reproduction.

ASEXUAL REPRODUCTION IN FUNGI

Most of the fungi prefer asexual mode of reproduction which lacks meiosis and nuclear fusion during the process. It takes place through fragmentation, budding, fission and sporulation. Fragmentation is very common in fungi where fragmented mycelia can develop into new individuals (Fig. 1.17). Mycelium of *Sarcomyces* (*Sarai*) reproduces via budding. The parent cell develops a small bud like protrusion which detaches from the parent cell and develops a new individual. Yeast also multiplies through fission in which each cell divides into two by forming a cell wall in between and each cell enlarges to form a new individual. (Fig. 1.18) The process is common in bacteria also. Most common type of asexual reproduction in fungi is through spore formation. Fungal spores are minute, globular or oval in structure having different shape and size. Usually fungal spores are divided into two groups conidia and the zoospores (Fig. 1.19).

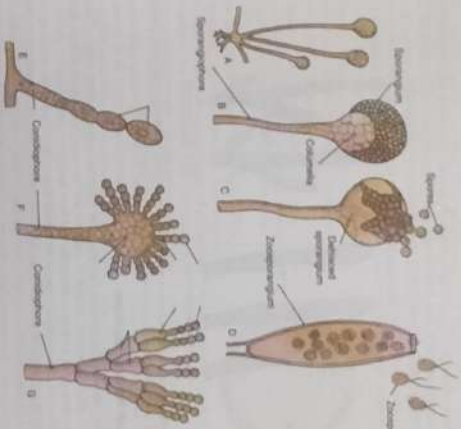
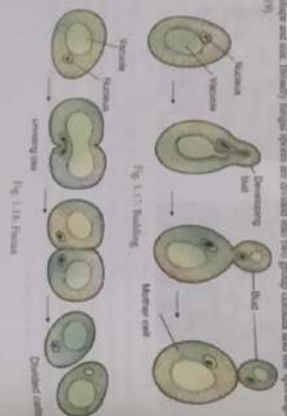


Fig. 1.19: Common types of asexual reproduction. A - C Spores; D, Zoospore; E - C Conidia

Sporangiospores

The spores which are produced inside the sporangia are called sporangiospores. Since these spores are produced inside the sporangia also termed as Endospores. Sporangiospores are of two types: (i) *Aplanospores*: When spores are not motile like produced in sporangium of *Aspergillus* and *Mucor* they are termed as aplanospores. (ii) *Zoospores*: When spores produced inside the sporangium are flagellated and motile they are termed as Zoospores. These zoospores may be biflagellate or biflagellate. E.g. *Ustilagium* (zoospores in *Sporangium endoblastum*) and biflagellate in *Sporangium*, *Aspergillus*, *Physoderma* etc.

Conidia (Sting : Conidium)

These spores are produced exogenously either singly or in the form of chains on the hyphal tip or lateral branch of the hyphae. The specialized branches bearing the conidia or conoidal chains are called conidiophores. Conidia germinate directly after falling on the suitable host or surface by giving out germ tube. If Conoidal chain in *Aspergillus* contains of long imperfect.