Kurdistan Region .Iraq
Ministry of Higher Education and Scientific Research
Salahaddin University-Erbil
College of Education

Fungal Reproduction

Rezhin A. Mohammed
M.Sc. Mycology

rezhin.mohammed@su.edu.krd

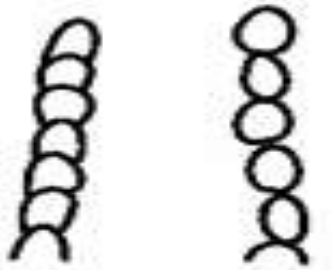
Fungal Reproduction

- Fungal Reproduction is the formation of new individuals having all the characteristics of the typical species.
- Fungi are reproducing sexually and asexually.
- Asexual stage of the fungal life cycle termed as the mitosporic, or anamorphic phase.
- Sexual stage of the fungus can be termed as the teleomorph, the characteristics of teleomorph phase of the life cycle are much more stable and reliable for taxonomic purposes.

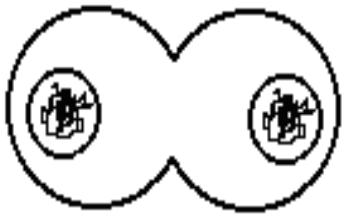
Fungal Reproduction

1. **Asexual reproduction:** Also called somatic reproduction, includes:

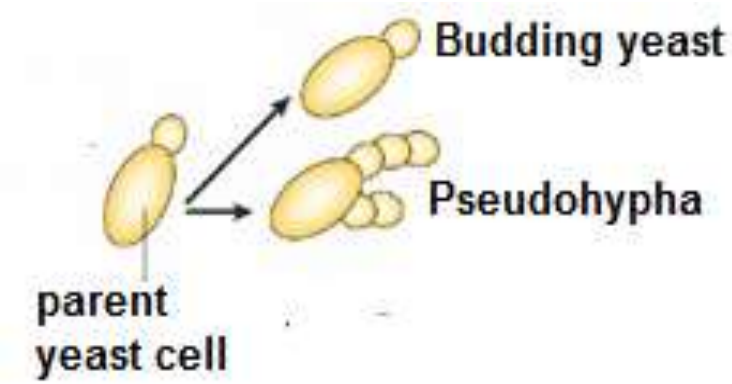
a. **Fragmentation:** Segmentation of the hypha into a number of fragments each growing into a new individual; many fungi can reproduce by fragmentation, any mycelium that is fragmented can grow into a new colony.



b. **Fission:** In this process, the parent cell splits into two equal halves, **each** of which develops into a new individual, it is characteristic of some yeast, e.g.: *Schizosaccharomyces* spp.



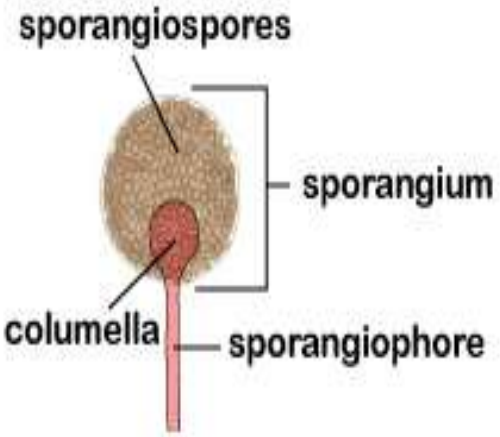
c. Budding: Is the production of a small outgrowth (bud) from a parent cell, the bud increase in size and breaks off and forms a new individual, chain of buds forming a short pseudo mycelium, it is common in unicellular fungi, e.g.: *Saccharomyces* spp.



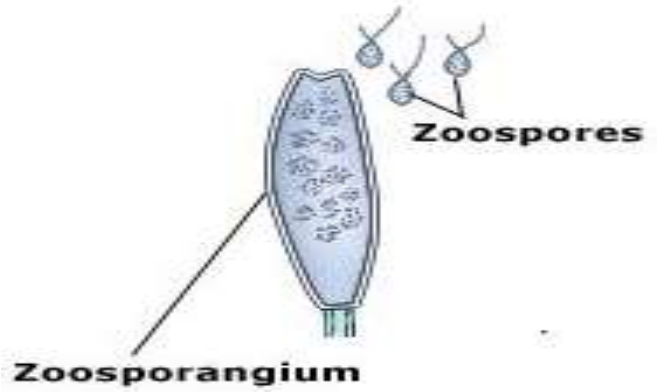
d. Production of spores (sporulation): The most common method of asexual reproduction in fungi is by means of spores. It is responsible for the production of large numbers of spores throughout the year; spores vary in color, size, shape, number of cell, arrangement of the cells and the way in which the spores are borne**. There are many types of spores:**

Types of spore:

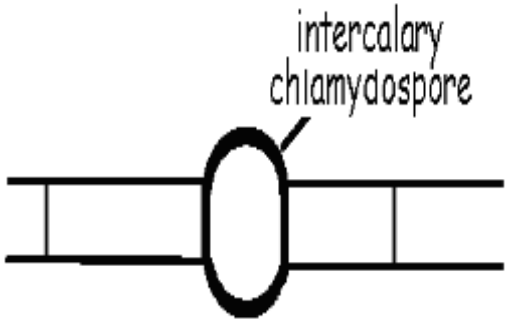
1. **a. Sporangiospores:** These are non-motile spores (aplanospores), produced inside structures called sporangia (**a sporangium is a sac like structure whose entire content converted into spores)** such as *Rhizopus* sp.



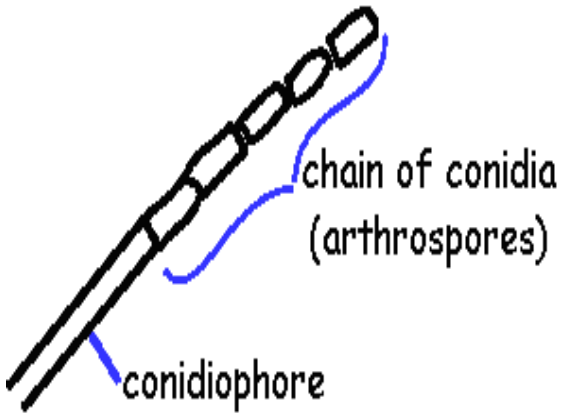
b. Zoospores: They are flagellated, motile spores produced inside structures called zoosporangia. These spores do not have a cell wall. Such spores are produced in lower fungi such as *Saprolegnia* sp.



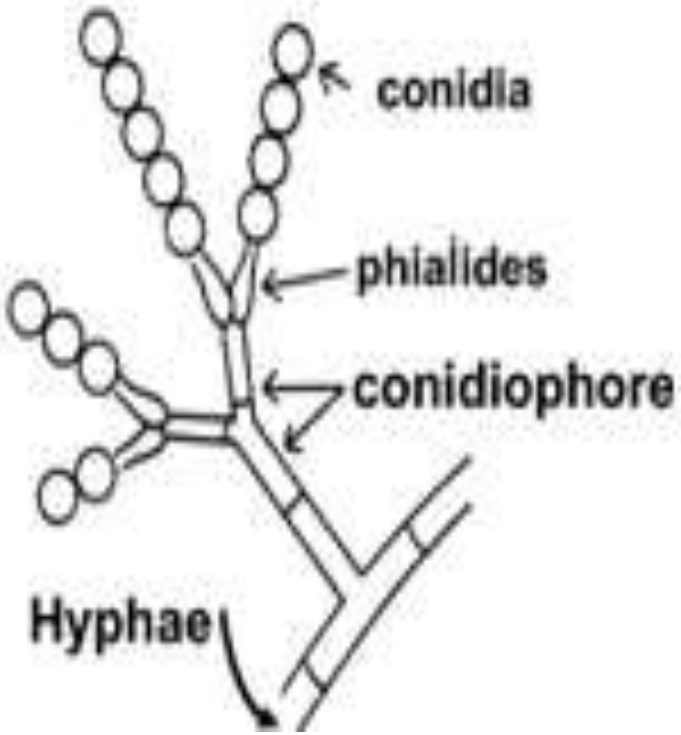
2. Chlamydospores: These are thick walled resting spores which arise directly from hyphal cells. A hyphal cell enveloped by a thick cell wall, which eventually becomes separated from the parent hypha and behaves as a resting spore.

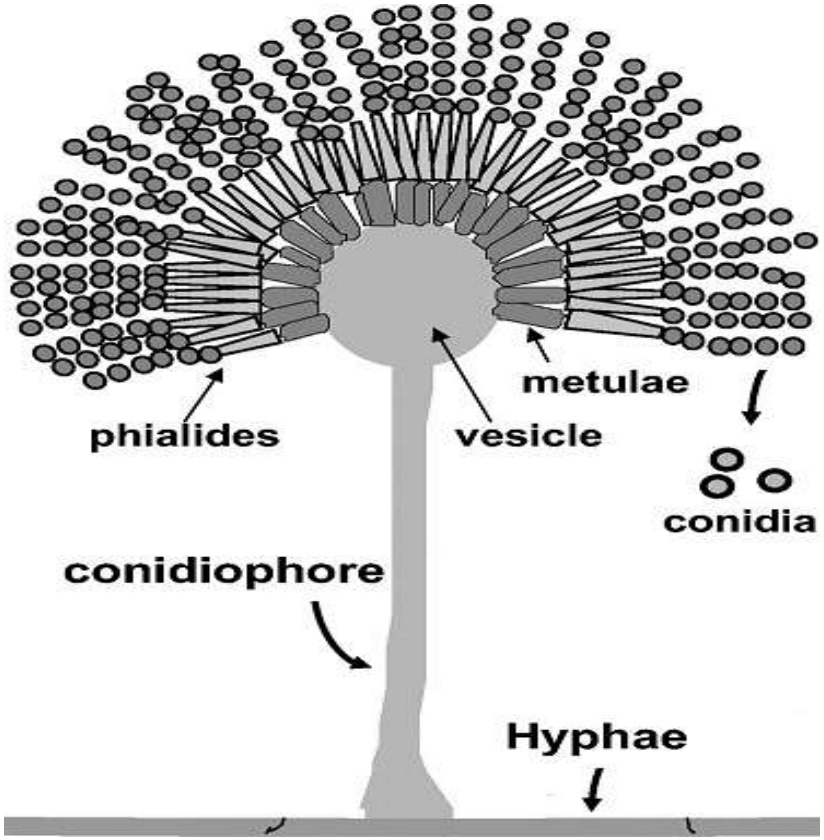


3. Arthrospores (Oidium): These are spore like structures formed by the breaking up of hypha cells.



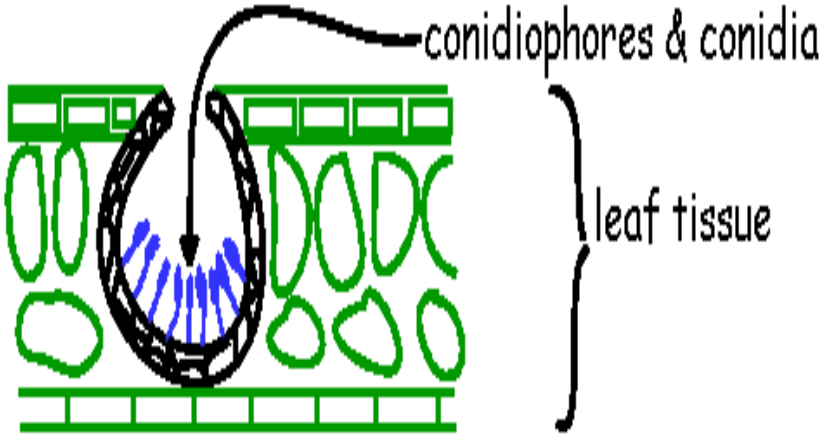
4. Conidia: These are non-motile spores produced singly or in chains at the tip or sides of hyphal branches that are called conidiophores or they may be organized into definite fruiting bodies, **the most common asexual fruiting bodies are:**



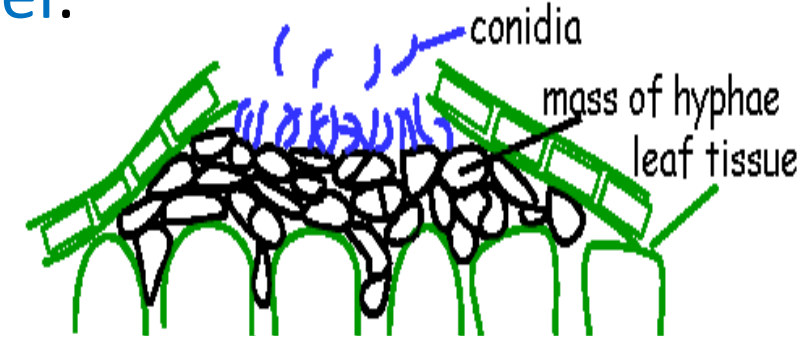


the most common asexual fruiting bodies are:

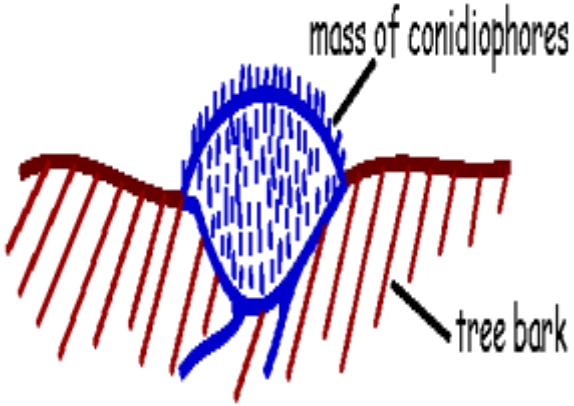
i. Pycnidium: Is a globose or flask shaped structure its wall is lined with conidiophores.

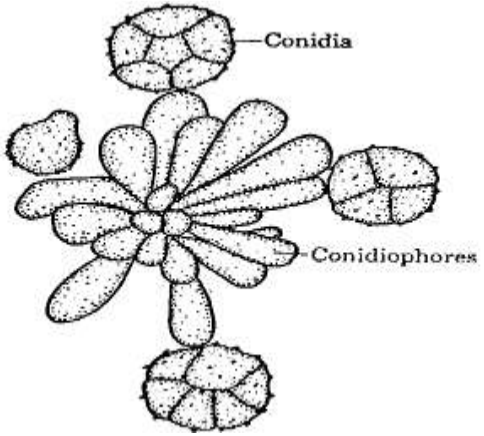


ii. Acervulus: A mat of hyphae usually formed below the epidermis of host by parasitic fungi, conidiophores are short and closely packed together.

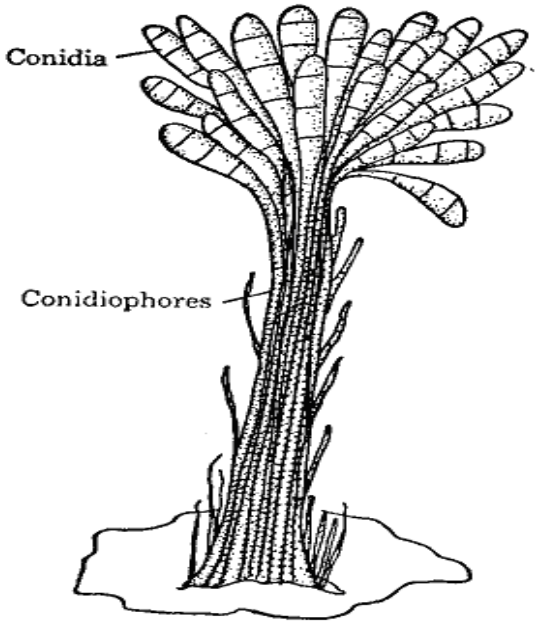


iii. Sporodochia: A cushion shaped structure covered with conidiophores.





iv. Synnema (Coremia): A group of conidiophores sementedtogether and forming an elongated spore- bearing structure.



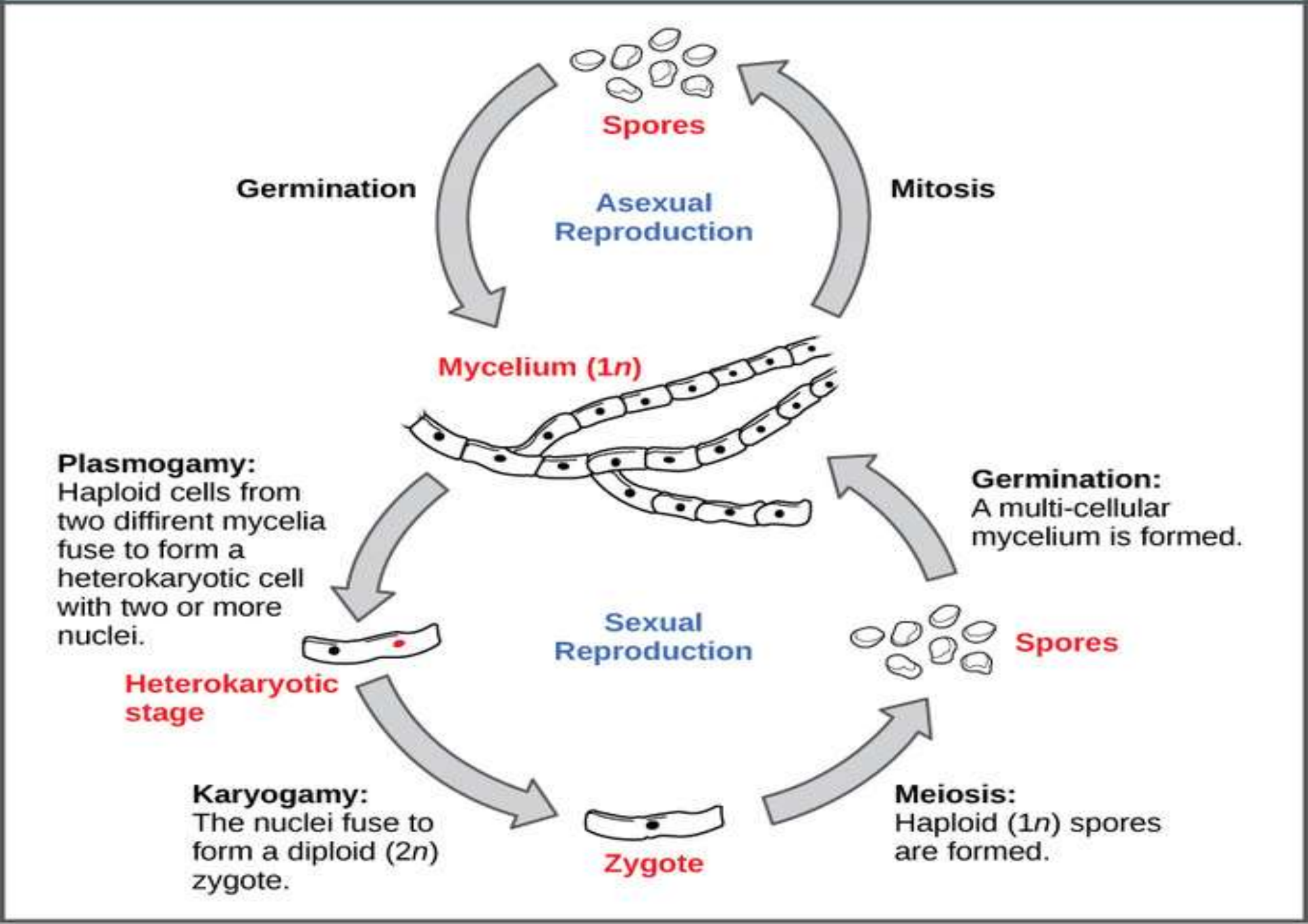
2. Sexual Reproduction: Sexual reproduction in fungi ,as in other living organisms, involves the union of two compatible nuclei. The process of sexual reproduction consists of three distinct phases:

1. **Plasmogamy:** a union of two protoplast brings the nuclei close together within the same cell. Plasmogamy resulting in a binucleate cell containing one nuclei from each parent. such pair of nuclei called dikaryon.

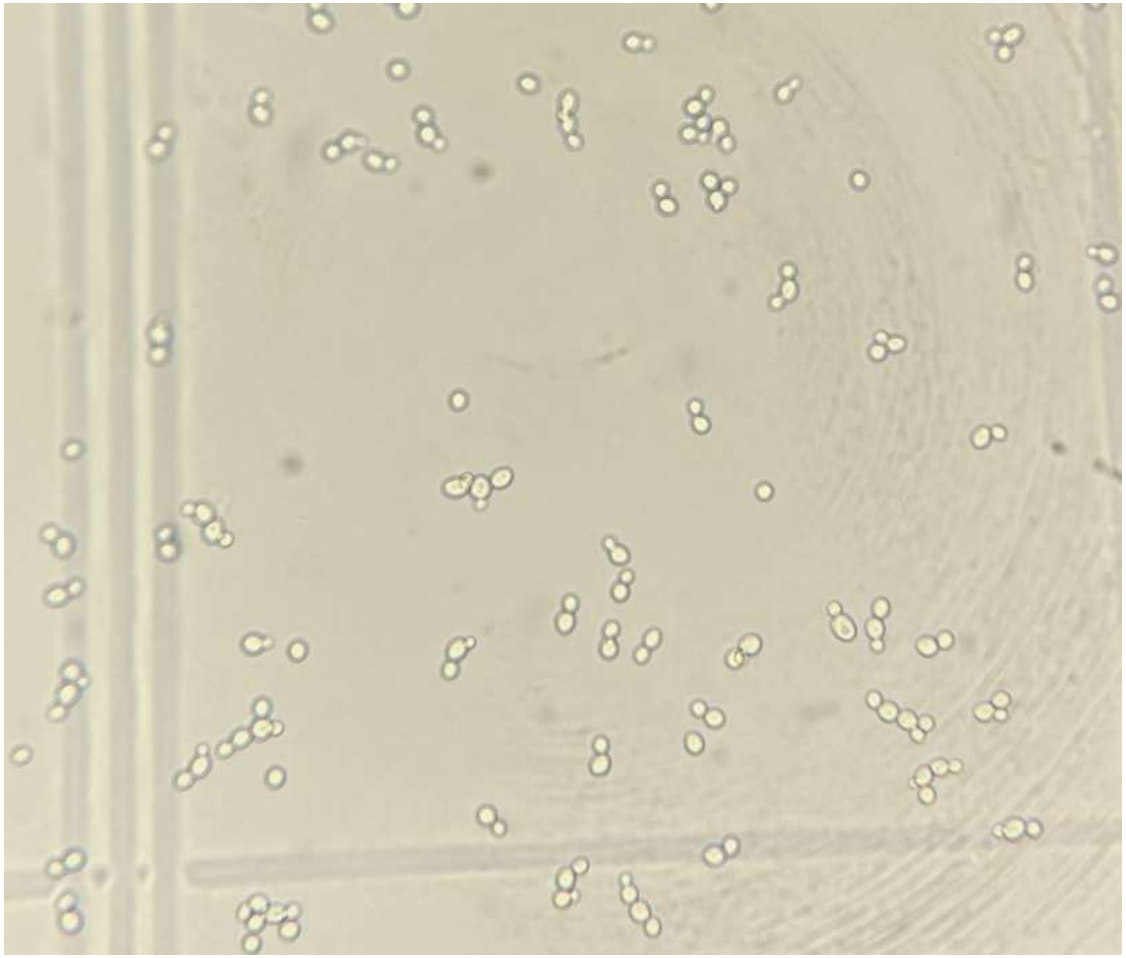
2. **Karyogamy:** Karyogamy follows plasmogamy almost immediately in some species, whiles in others these two events are separated in time and space; it is the fusion of the two nuclei brought together by plasmogamy.

3. **Meioses:** This again reduces the number of chromosomes to the haploid. The significance of sexual reproduction is that it results in a vary high incidence of recombination and formation of new genotypes. This enables fungi to adapt readily to a multitude of environmental conditions.

Fungi Life Cycle

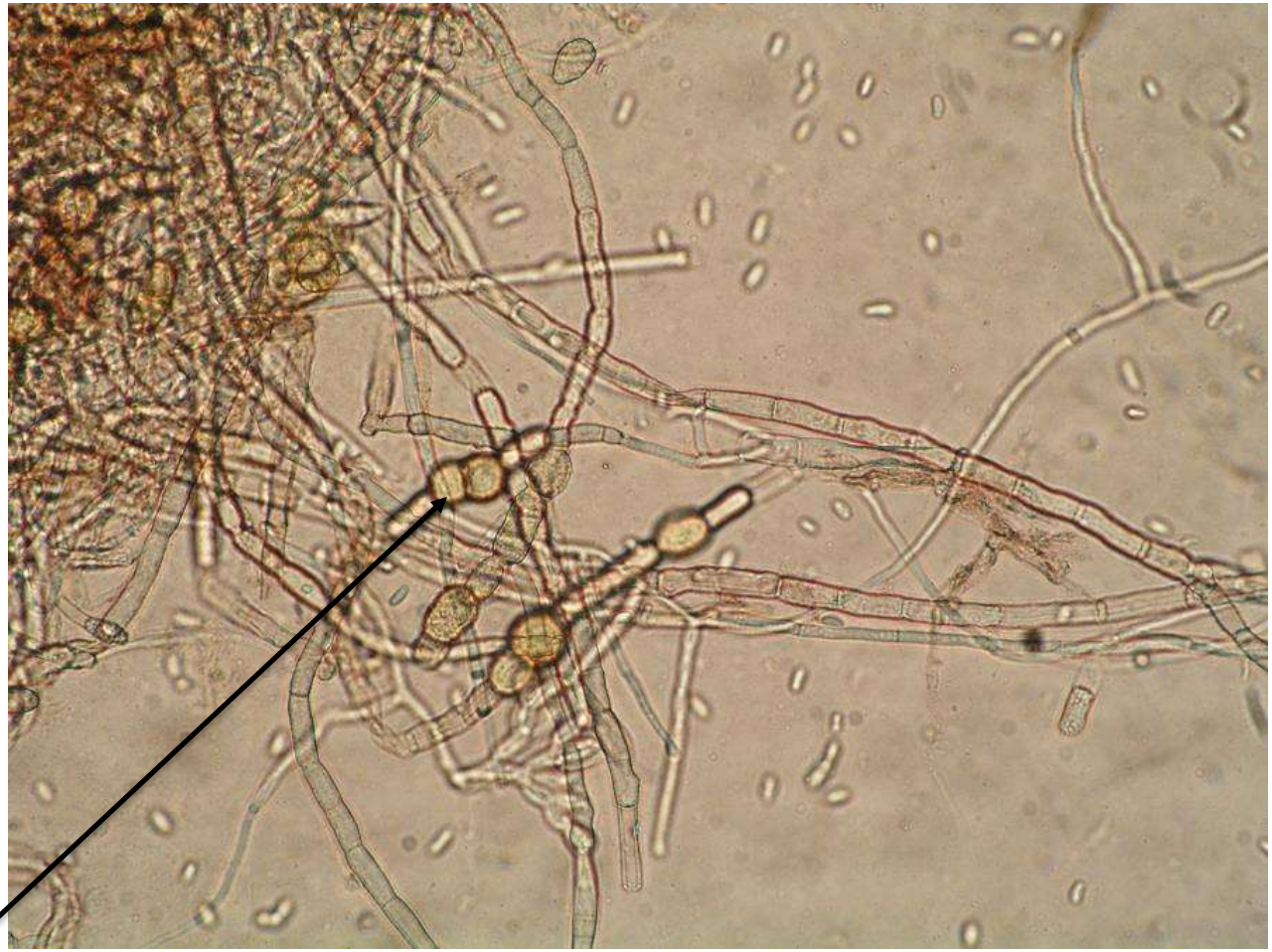


Peudohyphae *Candida albicans*

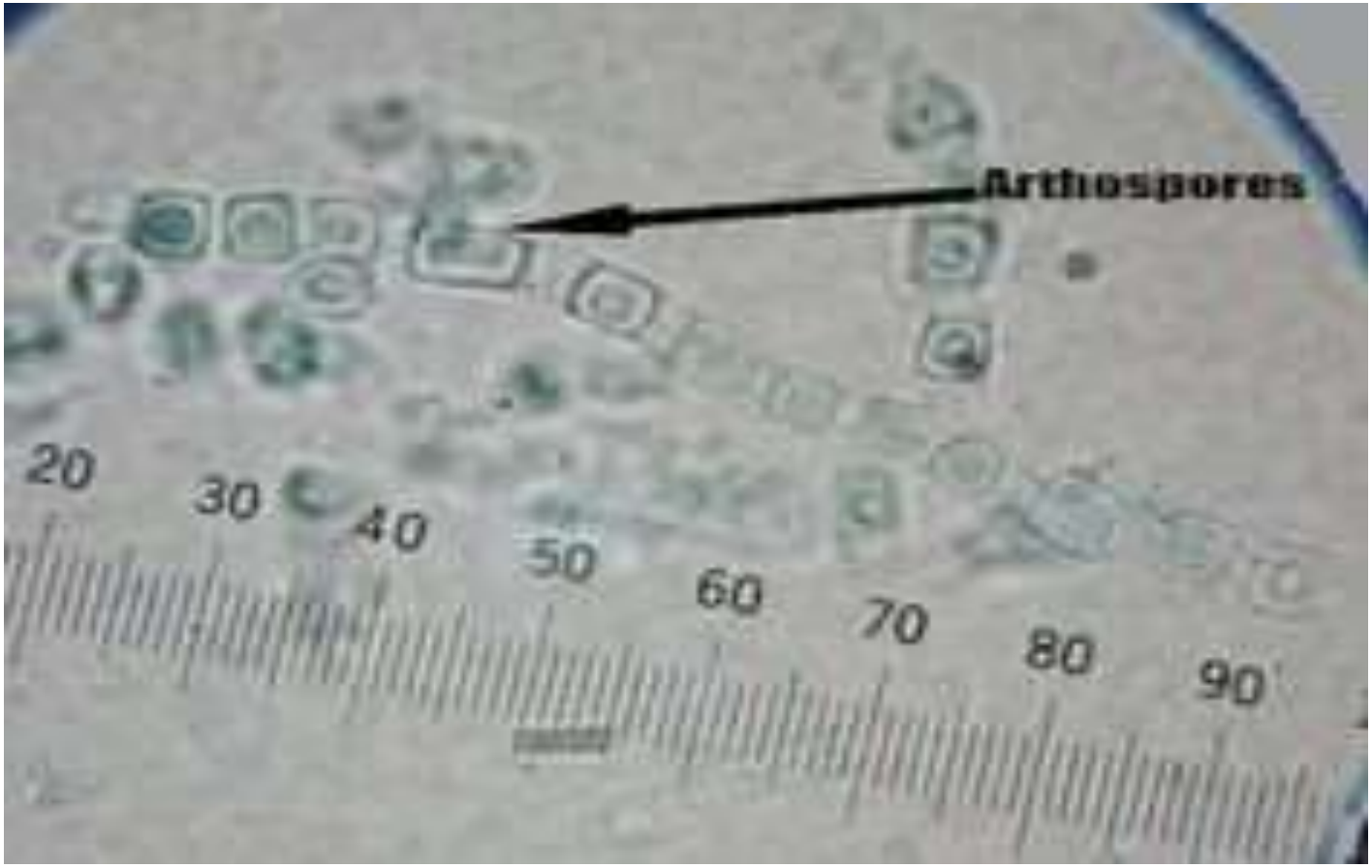


Budding *Candida albicans*

Sporangium *Rhizopus* sp.



Chlamydospore



Arthrospore

Conidiospore