

## Division 2: Eumycota

### Subdivision 1: Mastigomycotina:

This subdivision classified to **three** classes depending on **number**, **type** and **location** of **flagella**:

#### Class 1: Chytridiomycetes

General characteristics: -

- 1- Production motile cell zoospores and planogametes, each with a single, **posterior**, whiplash flagellum.
- 2- More prevalent in aquatic habitats, many of them, however, also inhabit the soil, some of them are parasites.
- 3- Somatic structures are:
  - a) Coenocytes structure.
  - b) Multinucleate, globose or oval with or without rhizoid
  - c) Well- develops mycelium.

This class was classified into **three** orders:

#### Order 1: Chytridiales:

General characteristics: -

1. Unicellular, globose, with or without rhizoid and holocarpic.
2. Water or soil inhabiting species, many of them former parasitic on algae and water mold, many of the later on vascular plants.
3. There are only a few economically important parasites in the entire order. *Synchytrium endibioticum* causes the disease known as **Potato wart** (Black wart disease on Potato).



## Life cycle of *Synchytrium endobioticum*:

The life cycle of *Synchytrium endobioticum*, the fungus responsible for **potato wart disease**, is involve:

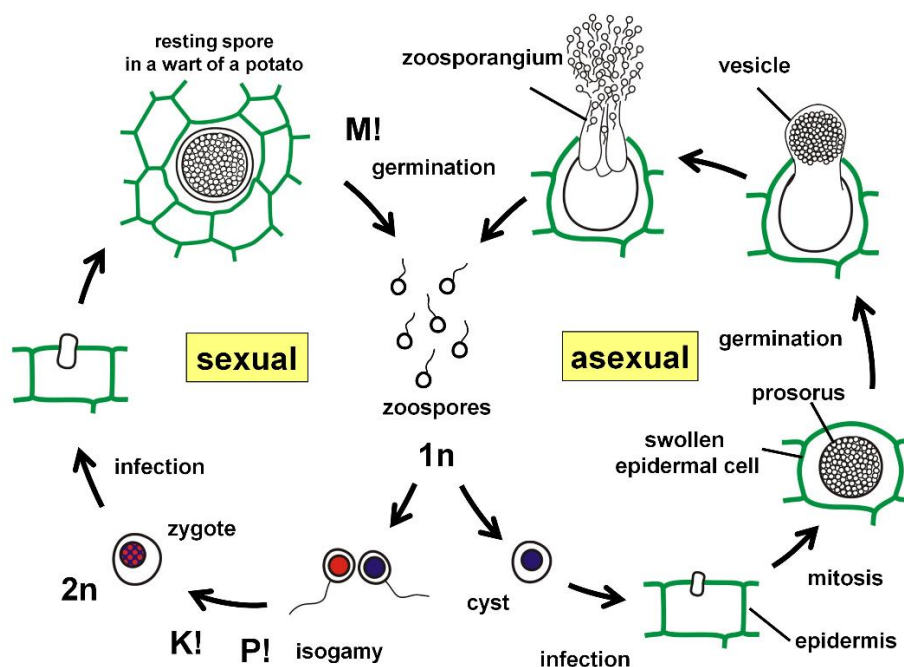
### Asexual cycle

The fungus causes **hypertrophy** and **hyperplasia** of the surface cell layers of the infected Potato tubers, which have **resting sporangia**. When the warts lyses, the resting sporangia are release in soil, and then the zoospores are released when the conditions are suitable. The zoospores are penetrating the host through the root hairs, then the zoospore increase in size and produce two layers chitinous wall around itself to form **Prosorus**. The fungus parasite increases in size, and mitosis is started to give 32 nuclei, then cytoplasmic septa are formed to form 4-9 sporangia in one sac—**Sorus**. The mitosis is continuous to give 100-300 nuclei in each sac, each nucleus will be converting to zoospore in the presence of water. The zoospore can penetrate the host again.

### Sexual cycle

Lacking the water at a certain period in the development of the fungus affords a maturation of gametes. These gametes are union in pairs to form zygote, which can penetrate the host cell. The parasite will increase in size and converting to resting sporangium, then the nucleus is undergoing division to give zoospores.

**Note:** It is considered that, meiosis is occurring during zoospore formation.



## Order 2: Blastocladales

General characteristics: -

1. Most of them are saprobes on animals and plants debris.
2. Vegetative structure is Eucarpic.
3. Somatic structure consists of basal cell with rhizoid and bearing one sporangium or more.

**Family: Blastocladiaceae**

ex: **Genus: *Allomyces***

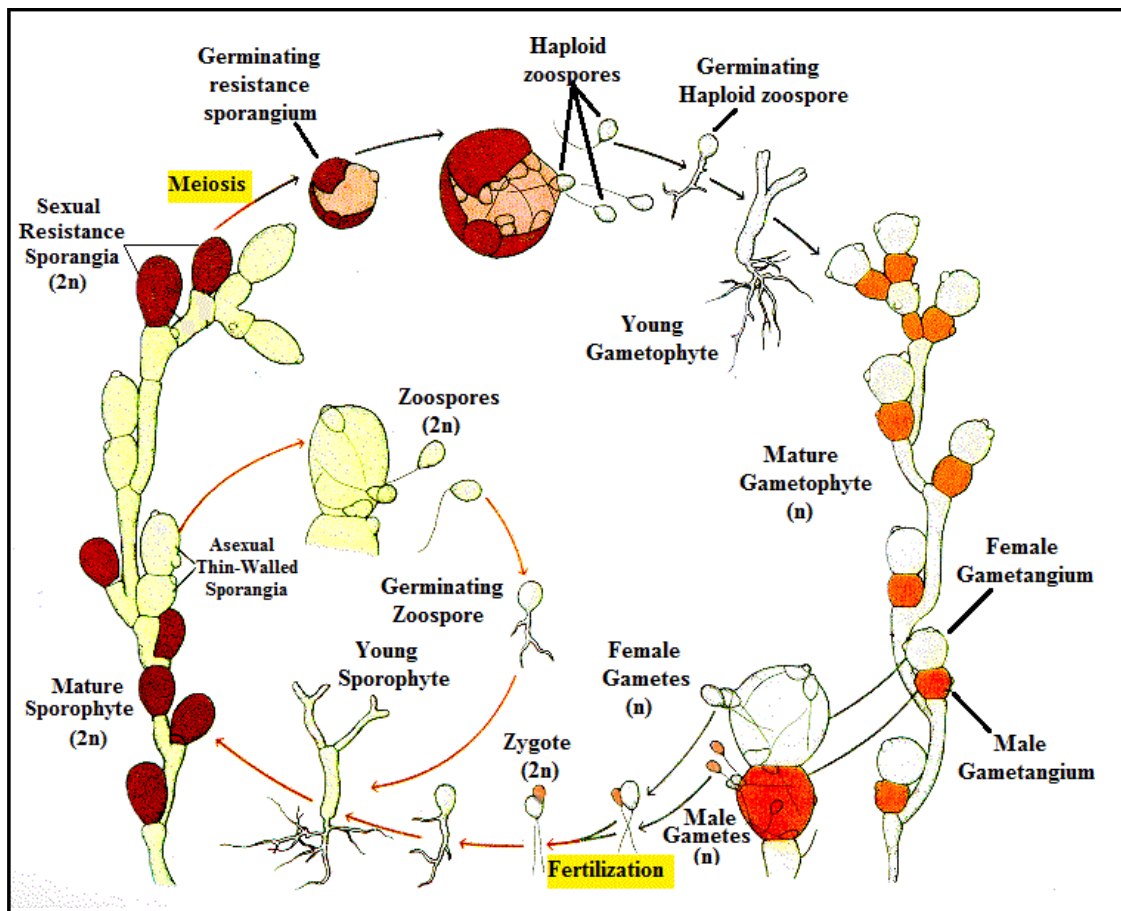
### **Life cycle of *Allomyces*:**

Species of the genus *Allomyces* exhibit a definite **alternation of generations**, haploid **gametothallus** alternating with diploid **sporothallus**. The gametothalli produce colorless female gametangia and orange male gametangia usually in a 1:1 ratio.

The male gametangia are smaller than female and borne on the later such as in *A. macrogynus* or below them such as in *A. arbuscula*. Both types of gametangia release motile gametes, the gametes are posterior uniflagellate, copulation then occurs to give zygote. Zygote enlarges and gives rise to the first hyphal tube, which elongates, branched dichotomously, and develops into a diploid sporothallus.

At maturity, the sporothalli form two types of sporangia; thin walled, elongated, colorless zoosporangia (**Mitosporangia**), and thick-walled, pitted, resistant sporangia (**Meiosporangi**) resting sporangia that have melanin pigments and appear reddish brown. The zoosporngia germinate soon after their formation, releasing diploid zoospores (mitospores) that swim about for a time, encysted and give rise to **sporothalli**, thus repeating the diploid generation. The resistant sporangia (Meiosporangia) require a rest of 2-8 weeks or more before they germinate.

Meiosis in the resistant sporangia takes place at the time of germination to form haploid zoospores; that are slightly smaller than the diploid. Then meiospores being haploid give rise to **gametothalli**, which produce gametangia instead of sporangia.



### Order 3: Monoblepharidales

Family: Monoblepharidaceae

Genus: *Monoblepharis*

### Class 2: Hypochytridiomycetes:

1. The hypochytridiomycetes, are aquatic, fresh-water or marine chytrid like fungi whose motile cells are **anterior** uniflagellate, with a tinsel type of flagellum.
2. They are parasitic on algae and fungi or saprobic on plant and insect debris in the water in which they live.
3. All are included in the single order hypochytridiales. Ex: *Rhizidiomyces*