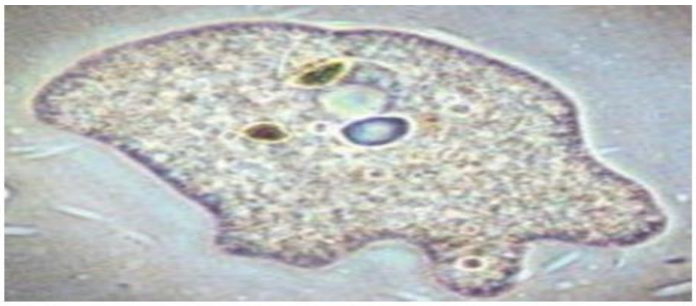
# Slime Molds - Myxomycota—plasmodial slime molds

**Kingdom Protoctista**
**Phyla of slime molds:**

- ☐ Myxomycota—plasmodial slime molds
- ☐ Plasmodiophoromycota—endoparasitic slime molds
- ☐ Dictyosteliomycota—cellular slime molds
- ☐ Acrasiomycota—cellular slime molds

Slime mold: An organism that produces a trophic stage that lacks a cell wall; phagotrophic
Trophic stages: amoebae, Plasmodia
Amoebae are uninucleate , Plasmodia are multinucleate, both lack cell walls, engulf food, and can multiply

**Amoeba or plasmodium?**
Amoebae are uninucleate
Plasmodia are multinucleate
Both lack cell walls, engulf food, and can multiply



## CELLULAR SLIME MOLDS

Cellular slime molds vs. plasmodial slime molds (Myxomycota)—trophic stage is uninucleate in cellular slime molds (**myxamoeba**) and multinucleate (**plasmodium**) in plasmodial slime molds.

**Myxomycota—plasmodial slime molds**
**Myxomycota: The true slime molds, or plasmodial slime molds**
**Phylum Myxomycota , Class: Myxomycetes**

There are approximately 500 species of Myxomycetes. They are found on moist soil, decaying wood, and dung. One of the more interesting characteristic about this group of organisms is that while the

species of other organisms will vary in different geographical localities,. Most species can be found throughout the world.

 **class Myxomycetes**

o 2 - 3 subclasses containing a total of 5 - 6 orders

o Orders are distinguished on the basis of

-Sporophore development •

-Type of sporophore produced •

-Method of spore production •

-Spore color •

Presence or absence of special thread-like structures collectively known • as( capillitium ) pl. capilitia; L. capillus = hair

Calcium (often called "lime") content of the sporophore, and•

.Plasmodium type •

Spore color •

**The Life Cycle of Myxomycota**

1. Once a spore is released from the fruiting body (**Sporangium**), it is dispersed, either by insects, animals, and rain or air movement. On landing on a suitable location with appropriate moisture and temperature, one to four protoplasts are germinated (**Figure 1**).
2. The protoplasts once released from the spore's wall through a pore will be either a flagellated swarm cell if conditions are wet, or a non-flagellated myxamoebae cell in dryer conditions.
3. If conditions for growth are not suitable, the cells can become microcysts to survive long periods of time.
4. A diploid zygote is formed when two compatible myxamoebae or swarm cells fuse. This is known as plasmogamy and karyogamy.
5. After a time of feeding and growing, the zygote develops into a single celled multinucleate structure known as a plasmodium.

6. If environmental conditions are not suitable, then the plasmodium can change into another dormant state known as the sclerotium.

7. When the conditions are suitable, the mature plasmodium produces one to many fruiting bodies (sporangia) containing spores depending on species.

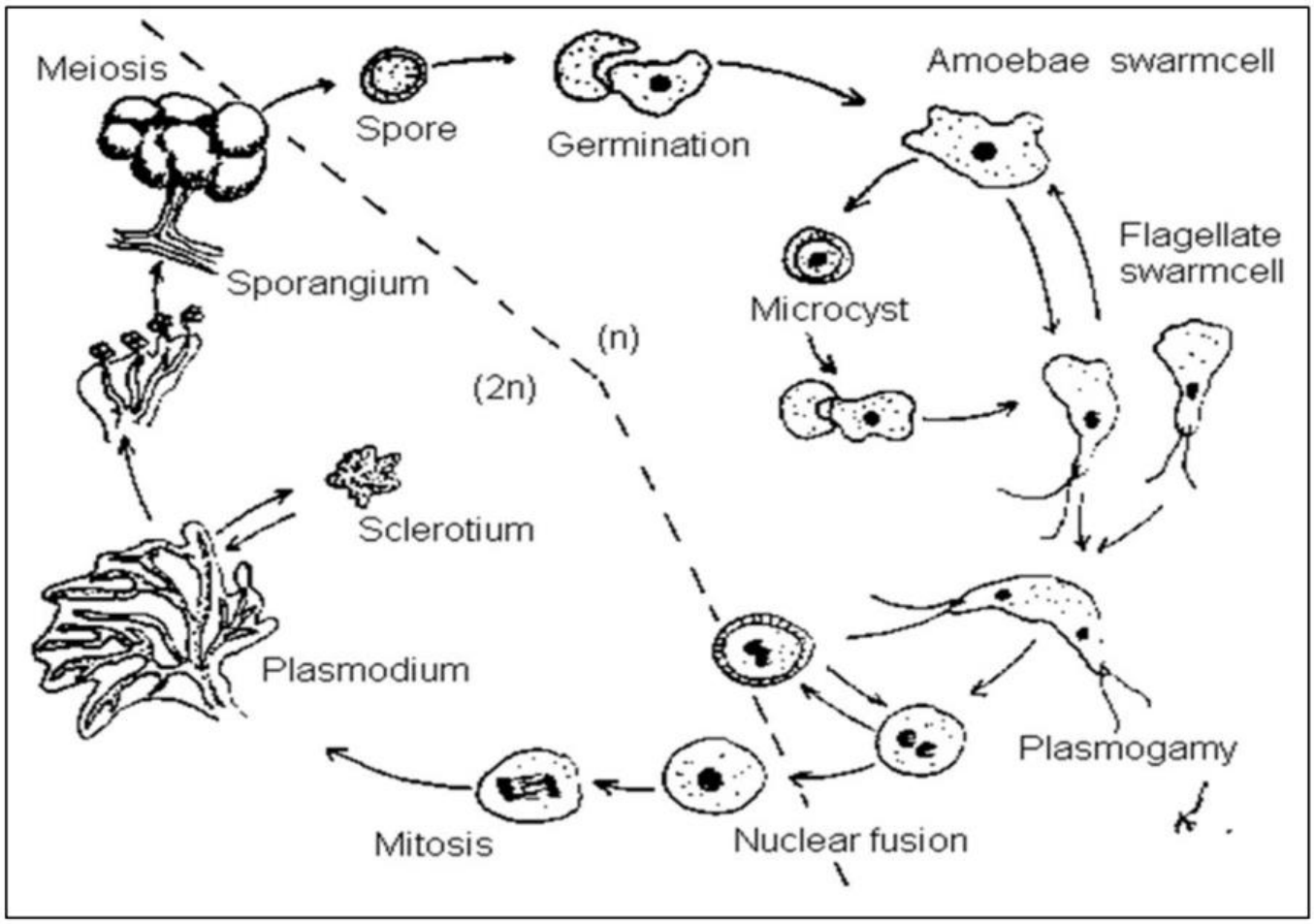



**Figure 1:** The typical Life Cycle of Myxomycota

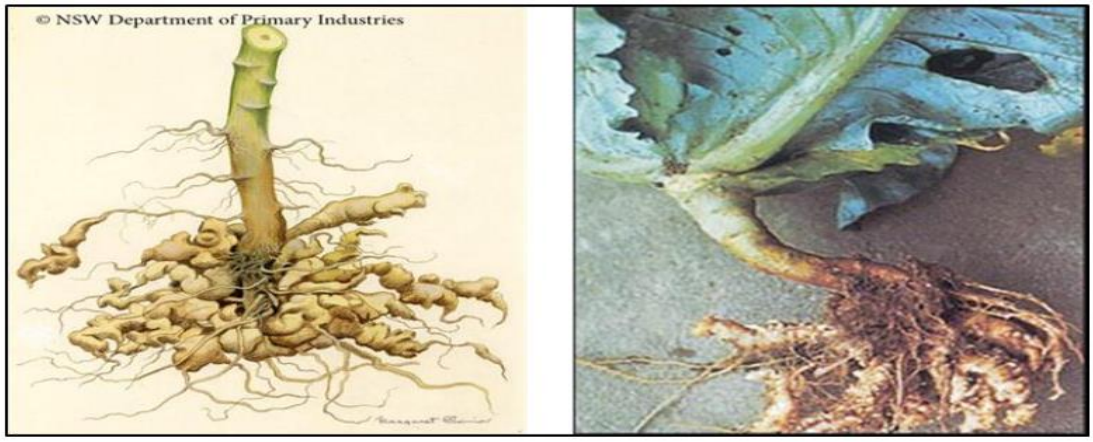
## Class: Plasmodiophoromycetes

Majority of these are obligate parasite, grow on algae, aquatic .(fungi and higher plants (commonly in roots

They typically develop within plant cells, causing the infected tissue to grow into a gall or scab. Important diseases caused by these -:members include

1-Club root in curcifer caused by genus Plasmodiophora brassicae

2-Powdery scab in potatoes caused by genus Spongospora subterranea




***Plasmodiophora brassicae***

***Spongospora subterranea***

**The Life Cycle of *Plasmodiophora brassicae***

- Is an obligate parasite, which survives in the soil only as dormant cysts. Primary zoospores released from germinating cysts infect host root hairs by encysting on the root surface and entering through developing epidermal cells in the form of an amoeba like cell .

- In the root hairs, amoeboid cells of the pathogen join together to form a multinucleate plasmodium. This plasmodium divides and forms multiple secondary zoospores, which are released into the soil. Secondary zoospores infect healthy parts of the initial host or infect nearby plants. These zoospores also enter through the host root hairs, but the infecting amoeboid cells migrate into the cortical cells of the host.

**o** Once in the cortex, the amoeboid pathogen infects one host cortical cell where it may multiply or join with other amoeboid cells to form a plasmodium.

**o** As the plasmodium develops, it releases plant hormones which cause the host cells to enlarge up to 20 times of its normal size. As the plasmodium grows, it divides and infects neighboring cells causing them to enlarge. Clusters of these enlarged cells are responsible for the clubbing on the roots.

**o** Plasmodium in all host cells eventually undergo meiosis and develop into resting cysts. These new cysts will be released into the soil because other soil microorganisms decompose the club root.