Division 1: Myxomycota

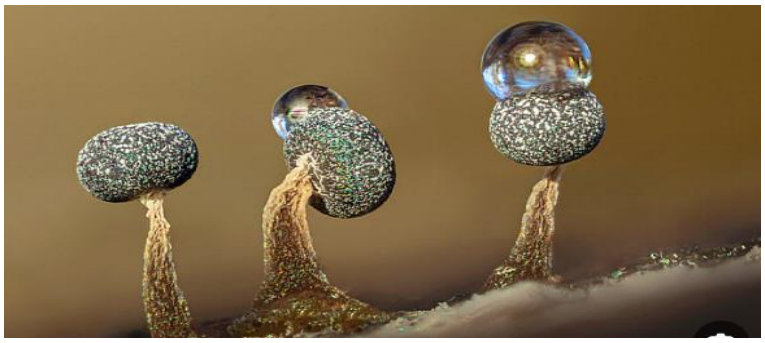
Myxomycetes (slime molds) do not typically cause human disease or pose significant health risks. Here are the key points:

1. Myxomycetes are not known to be pathogenic or of economic importance.
2. Myxomycetes are not fungi, but rather free-living amoeboid organisms, despite historically being classified with fungi due to some similarities in appearance and lifestyle.
3. There is no evidence that Myxomycetes cause invasive infections or systemic diseases in humans.
4. The main potential health impact of Myxomycetes appears to be related to allergies.

Class 1: Myxomycetes

It is considered slime molds animals and called them –**Mycotozoa**, because the vegetative phase is **like-plasmodium**. They have a free- living, a cellular, multinucleate somatic plasmodium. Produce **flagellated** swarm cells inside a fructification sporophore that usually develops a peridium enclosing the spores. There are **three** types of (sporophore) reproductive organs in class Myxomycetes:

1- Sporangium: This sporangium either **bearing on stalk** or **stalkless** (sessile), each sporangium has a peridium of its own. There are spores and capilitium inside sporangium Fig: 1 Ex: *Physarum*.



2- Plasmodiocarp:Is similar to a stalk less sporangium. In the formation of plasmodiocarp, the protoplasm concentrates around some of the main veins of the plasmodium and secreting a membrane around itself Ex: *Trichia*.

3- Aethalia: A group of sporangia that have **not** separated into individual units. Ex: *Lycogala*.

Plasmodiocarp *Trichia*/

Aethalia *Lycogala*

Life cycle of a typical Myxomycetes

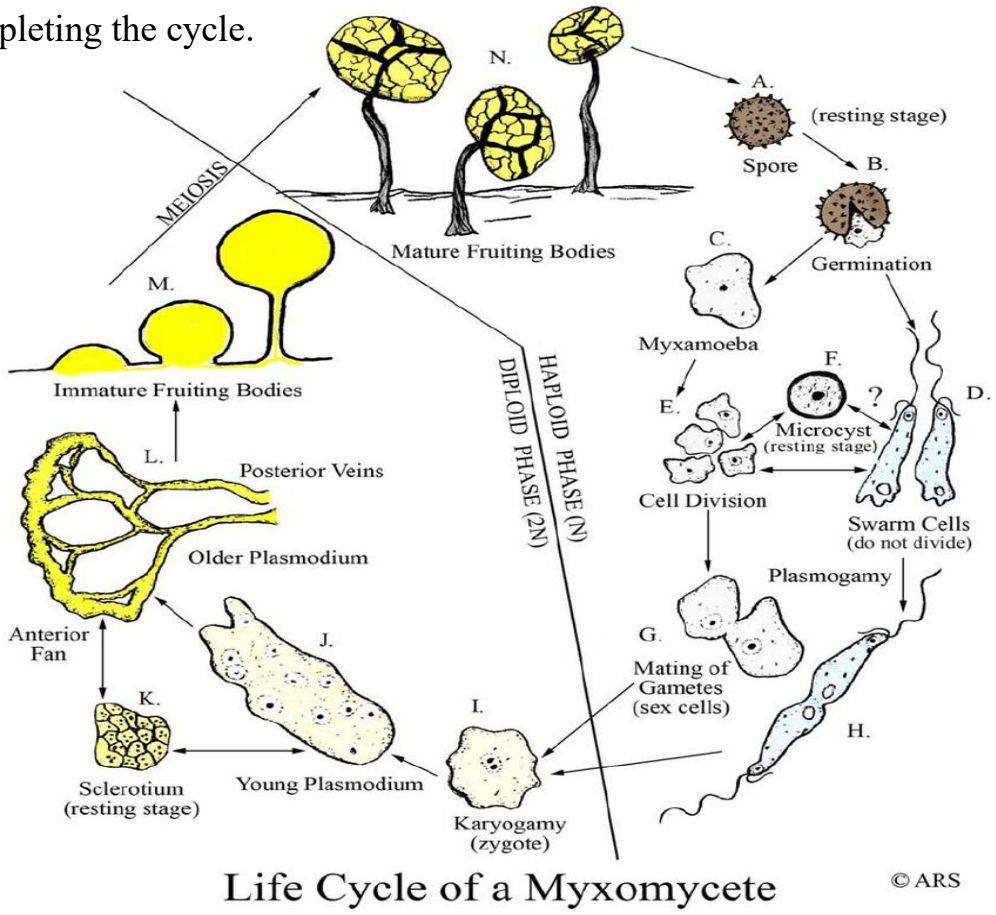
- **Spore Stage:** The cycle begins with microscopic spores released from mature fruiting bodies. These spores are highly resistant and can remain dormant for long periods.
- **Unicellular Stage:** When conditions are favorable, the spores germinate to produce one to four **haploid**, unwalled protoplasts. These protoplasts can take two forms:

1. **Flagellated** swarm cells (in moist conditions).
2. **Amoeboid** cells (in drier conditions).

These unicellular forms, known as **myxamoebae**, feed on bacteria and divide by binary fission.

- **Zygote Formation:** Two compatible myxamoebae or swarm cells fuse to form a **diploid zygote**. This involves the fusion of both their protoplasm and nuclei.
- **Plasmodium Stage:** The zygote develops into a plasmodium a large, multinucleate cell that grows and feeds as it moves through its environment.
- **Fruiting Body Formation:** Under certain conditions (which are not fully understood), the plasmodium undergoes a transformation to produce one or more fruiting bodies (sporangia). These structures are typically small (1-2 mm) but visible to the naked eye.

- **Spore Production:** Within the fruiting bodies, new spores are produced, completing the cycle.



Classification of Class 1: Myxomycetes

This class classified into two subclasses according to the **position of the spores** in relation to the fruiting body.

Subclass 1: Ceratiomyxomycetidae: In this subclass spores born **outside** (No fruiting body)

Order: Ceratiomyxales ex: **Genus:** *Ceratiomyxa:* This genus called exospores, there is **no** sporangium.

Subclass 2: Myxogastromycetidae: In this subclass spores born **inside** sporangia (fruiting body) (Endospores). This subclass classified into **4** orders according to:

1. The color of sopres.
2. Presences or absence of capilitium.
3. Presence or absences of lime.

Order 1: Liceales: Spores in mass are pallid or brightly colored. The capilitium and columella are lacking but Pseudocapilitium is often present. The lime is absences Ex: *Lycogala*

Order 2: Trichiales: Spores are yellow to orange colored. The capilitium is presences and the columella is lacking.The lime is absences. Ex: *Arcyria.*

Order 3: Stemonitales: Spores are dark or black in color**.** The capilitium and columella are presence. Lime is absences. Ex: *Stemonitis.*

Order 4: Physarales: Spores are dark or black in color. The capilitium and columella are presence. Lime is presence. Ex*: Physarum*

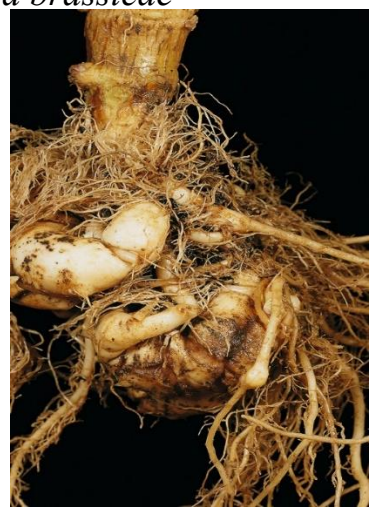
Class 2: Plasmodiophoromycetes**:**

General characteristics:

1. The somatic phase is a plasmodium that develops within the host cells (Endo) parasite.
2. Produce two types of spores, **zoospores** and **resting spores**.
3. When the resting spores are germinated give zoospores.

Family: Plasmodiophoraceae /// Ex:- *Plasmodiophora brassicae*

Causes: **Club-root disease** in Cruciferae Figure 4.



Life cycle of *Plasmodiophora brassicae*

Survival in Soil: *P. brassicae* produces thick-walled resting spores that can survive in soil for up to 15 years. These resting spores are highly resilient to harsh environmental conditions.

Primary Infection:

1. Resting spore germination: Chemicals released by host plant roots stimulate resting spores to germinate and release **primary zoospores**.
2. Root infection: Primary zoospores infect root hairs and epidermal cells in the root elongation zone.
3. Primary plasmodium: Inside infected cells, the pathogen forms uninucleate **primary plasmodia**.
4. Zoosporangia formation: The primary plasmodium undergoes nuclear division and cytoplasmic cleavage to form **zoosporangia**.

5. Secondary zoospore release: Zoosporangia produce and release 4-16 secondary zoospores.

Secondary Infection

1. **Cortical invasion**: Secondary zoospores penetrate and infect cortical root tissues.
2. **Conjugation**: Secondary zoospores may undergo conjugation in root epidermal cells.
3. **Secondary plasmodium**: The pathogen develops into uninucleate, then multinucleate secondary plasmodia in cortical cells.
4. **Cellular changes:** Infected cells undergo hypertrophy and abnormal cell division, leading to gall formation.

Spore Production and Release

1. Resting spore formation: Uninucleate resting spores form within the galls
2. Gall decay: As galls decay, large numbers of resting spores are released back into the soil.