

### Classification of Myxomycetes

The Latin name *Myxomycota* comes from the Ancient Greek words *μύξα* (*myxa*), which means "mucus", and *μύκης* (*myces*), which means "fungus". The true slime molds, or plasmodial slime molds, containing about 500 described species. These organisms exhibit phagotrophic nutrition.

### General characteristic of Myxomycetes:

1. Free-living multinucleate, naked, acellular protoplasmic mass called plasmodium represents the thallus.
2. The entire plasmodium organized in one or more plant like fruiting bodies called sporangia.
3. The somatic phase are represented by the plasmodium is the holocarpic, free living and active.
4. The spore wall differentiated into two layers, the outer of which is sculptured or spiny.
5. Spores germinate to giving biflagellate swarm cells, which function as gametes.
6. The sexual reproduction is isogamous type.

Class Myxomycetes contains 2-3 subclasses, containing much order from which Physarales, Stemonitales, and Ceratiomyxales.

### Orders distinguished based on

1. Sporophore development
2. Type of sporophore produced
3. Method of spore production
4. Spore color

5. Presence or absence of special thread-like structures collectively known as capillitium

6. Calcium (often called “lime”) content of the sporophore, and

7. Plasmodium type

### **Basic types of plasmodia**

**1. Protoplasmodium** - Microscopic throughout its existence; gives rise to only a single sporangium when it fruits.

**2. Aphanoplasmodium** - Resembles a protoplasmodium in its initial stages, but soon elongates, branches, and becomes a network of very fine, transparent strands; Stemonitales.

**3. Phaneroplasmodium** - It resembles a protoplasmodium at first; it grows larger and becomes more massive. Its protoplasm is very granular, and the plasmodium is visible even at an early stage of development. The gelified and fluid portions of the veins are easily distinguishable and the rhythmic, reversible streaming is very conspicuous.

Recent phylogenetic analysis divides slime molds into two superclades depending on the appearance of their spores and further into several orders and families According to Stephenson and Schnittler the classification of *Myxomycetes* can be summarised (to the level of order) as follows:

- Myxogastria
  - Collumellidia
    - Echinosteliales
    - Physarales
    - Stemonitales
  - Lucisporidia
    - Liceales
    - Trichiales

### **Kingdom : Protista**

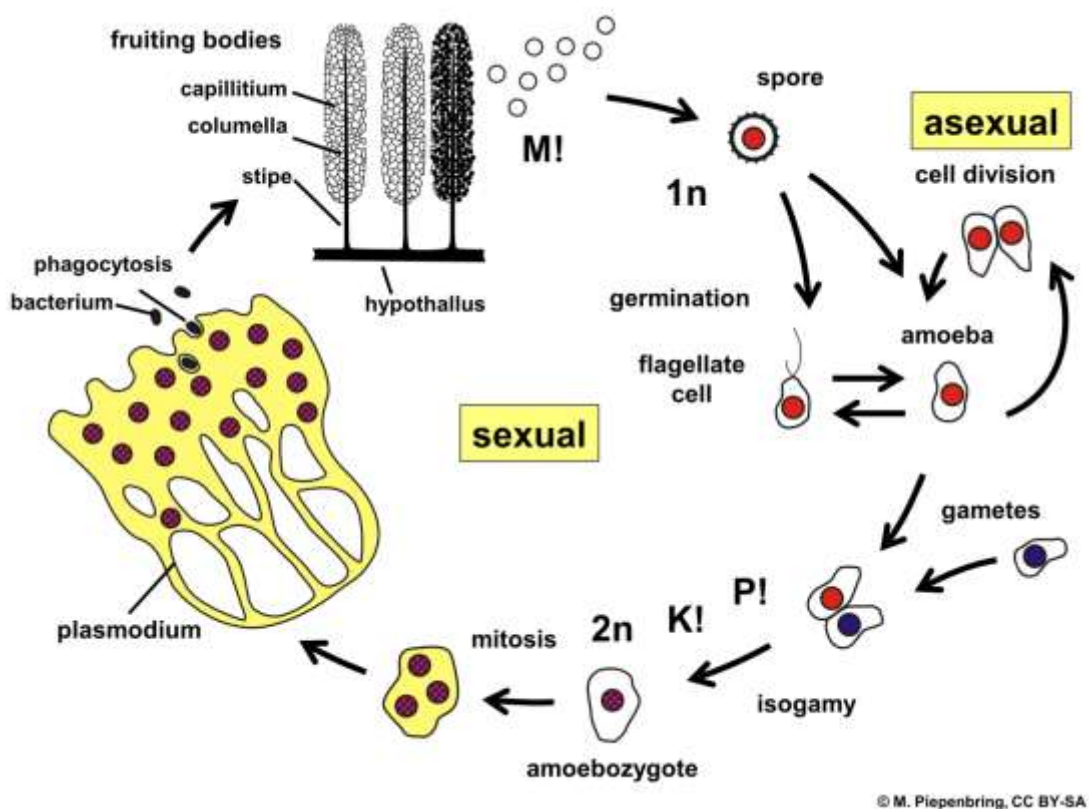
Phylum: Myxomycota

Order: Stemonitales

Family: Stemonitidaceae

**Genus stemonitis:**

This is one of the most common Myxomycetes growing on dead wood and dead leaves (Fig. 328A). The plasmodium is of aphanoplasmodium type. The colour of the plasmodium is usually watery to creamy-white, often may be pale-yellow. . They are characterised by the tall brown sporangia, supported on slender stalks, The solid stalk extends within the sporangium usually to near the apex as a columella. The capillitium is formed of numerous threads radiating from all parts of the columella , grow in clusters on rotting wood.<sup>1</sup>



## Kingdom 2 Straminipila (chromista )

### Phylum : Oomycetes

#### Class: Oomycetes

Oomycetes have assigned the name (water molds) by several investigators.

#### General characteristics of Oomycetes:

1. Although Oomycetes occur in variety of habitats, a majority of them are aquatic fungi, and a few live parasitically on algae, water molds, aquatic insects and other animals as well as plants, some higher forms grow in the soil, e.g. Some Saprolegniales and Peronosporales
2. The mycelium is well-branched, filamentous coenocytic and grown abundantly in the substratum, however, some Oomycetes are unicellular
3. The cell wall shows the presence of cellulose, which is very rare in most the other fungi. the chitin is mostly absent
4. A majority of Oomycetes are eucarpic, i.e develop reproductive bodies in some parts of the thallus
5. Zoospores are produced by almost of all Oomycetes
6. The zoospores produced inside zoosporangium
7. Many Oomycetes produce only the kind of zoospores, which germinate directly into new fungus, such species called monoplanetic and this phenomenon called as monoplanetism
8. Many Oomycetes produce non-motile asexual spores, generally at the tip or side of unbranched hyphae
9. Sexual reproduction is Oogamous-taking place by gametangial contact, and results in the formation of thick walled resting spore or oospore
10. The life cycle in a majority of Oomycetes is haplobiontic –diploid

Previously the group was arranged into six orders.

1-The **Saprolegniales** are the most widespread. Many break down decaying matter; others are parasites.

2-The **Leptomitales** have wall thickenings that give their continuous cell body the appearance of septation. They bear chitin and often reproduce asexually.

3-The **Rhipidiales** use rhizoids to attach their thallus to the bed of stagnant or polluted water bodies.

4-The **Albuginales** are considered by some authors to be a family (Albuginaceae) within the Peronosporales, although it has been shown that they are phylogenetically distinct from this order.

5-The **Peronosporales** too are mainly saprophytic or parasitic on plants, and have an aseptate, branching form. Many of the most damaging agricultural parasites belong to this order.

6-The **Lagenidiales** are the most primitive; some are filamentous, others unicellular; they are generally parasitic.

### **Saproleginales**

- It was known as water molds
- Mostly saprophytes some are parasites (e.g. *S. parasitica* on salmon)
- Large diameter hyphae; profusely branched; coenocytic
- Several oospores/oogonium
- Mostly eucarpic, some holocarpic; hermaphroditic & homothallic
- Morphology of sexual stages used to delimit species
- Asexual reproduction; long cylindrical terminal zoosporangia; sporangium morphology and zoospore release are used to delimit genera
- Zoospores primary and/or secondary, mono- or dimorphic; mono-, di- or polyplanetic

*Saprolegnia* is the main genus of water molds responsible for significant fungal infections of freshwater fish and eggs. It like most water moulds, is both a saprotroph and necrotroph (facultative parasites). Typically feeding on waste from fish or other dead cells, *Saprolegnia* has a complex life cycle which includes both sexual and asexual reproduction. Sexual reproduction involves the production of antheridium and oogonium gametangia, which unite for fertilization

The asexual spore of *Saprolegnia* release motile, primary zoospores. Primary zoospores are active only for a few minutes before they encyst, germinate, and release a secondary zoospore. Secondary zoospores are more motile for a longer period of time than primary zoospores then also encysts, before it germinates into a new mycelium,

### **Kingdom : Fungi**

**phylum:** Chytridiomycota

Fungi produce zoosporic flagellated cells during their life cycle.

Class : Chytridiomycetes

### **General characteristic of Chytridiomycetes:**

- The chytridiomycetes, or “chytrids,” are usually aquatic, either marine or freshwater.
- The chytrids are mostly single-celled forms; chytrids have no light-sensitive pigments.
- Presence of posteriorly uniflagellate celled zoospore. The flagella are of whiplash-type.
- In fact, chytrids are the only large taxon of fungi, which produces a zoospore of any kind.
- Chytrids have an absorptive mode of nutrition, like other Fungi.
- Chytrids have cell walls composed of chitin.
- Sexual reproduction is by isogamy to oogamy conjugation, asexual reproduction by uninucleate zoospores.
- Chytridiomycetes classified into the following important orders, chytridiales and blastocladales.

### **General characteristic of order Chytridiales**

1- Chytridiales found in aquatic as well as terrestrial conditions. They occur parasitically on algae, vascular plants e.g. *Synchytrium endobioticum*.

2- Many forms are endobiotic, live completely within the cells of the host, whereas some are also epibiotic life on the host surface.

3- Asexual reproduction takes place with the help of zoospores, which are posteriorly uniflagellate.

4- Zoospore-containing body is a spherical or pear-shaped sac, called zoosporangium.

5- Sexual reproduction has not observed in a majority of the chytrids. A thick-walled resting spore or resting sporangium formed after sexual reproduction.

6- Chytridiales classified into many important families from which synchytriaceae (e.g. *Synchytrium endobioticum*).

### **General characteristic of family Synchytriaceae**

1. Members are unicellular, holocarpic and lacking a true mycelium.
2. Thallus divides into many compartments at the time of reproduction, which used as sporangia or gametangia.

3. Many gametangia or sporangia remain enveloped in a common membrane to form a sorus.
4. A sexual reproduction by unflagellated zoospores whereas sexual by gametes. e.g. *Synchytrium endobioticum*

Like some other Chytridiales, *Synchytrium endobioticum* develops no mycelium. The fungus produces a thick walled structure known as a winter sporangium. It is 25-75  $\mu\text{m}$  in diameter and contains 200-300 spores. Sporangia clustered into thin-walled soruses.

The motile life stage, zoospore is about 0.5  $\mu\text{m}$  in diameter and has one posterior flagellum. causes the potato wart disease or black Scab. It also infects some other plants of the *Solanum* genus, though potato is the only cultivated.

### **General characteristics of the order Blastocladales:**

1. Members of the Blastocladales are order is chiefly occur saprophytically in water or soil. Some inhabit plant or animal debris .However, Coelomomyces is an obligate parasite of mosquito larvae and other invertebrates.
2. The thallus is eucarpic in all the Blastocladales except Coelomomyces where a naked plasmodium like thallus is present.
3. The cell wall in a majority of Blastocladales consists of chitin however; proteins, glucans, and ash also reported in the wall of some genera.
4. All Blastocladales produce thick -walled resting sporangia with pitted wall.
5. The zoospores are posteriorly unflagellate.
6. The sexual reproduction is isogamous in some and anisogamous in other investigated species. However, in many species sexual reproduction has not observed.
7. The gametes, if present are unflagellate.
8. Blastocladales show different types of life -cycle patterns.

Important genera include *Allomyces*, *Blastocladia*, and *Blastocladopsis*.

The family Blastocladaceae includes four genera of these *Allomyces* is the best known Genus *Allomyces*