



**Department of biology**



***Department of Biology***

**2025-2026**

**((Mycological Taxonomy))**

**Stage (-3-)**

**LEC- ((1))**

**Oomycota**

**By**

**Asst.Lec .Baneen Maen Kareem**





## Department of biology



Order: Saprolegniales

Mostly found in freshwater, living on decaying plant and animal matter, with some species occurring in soil or saltwater

Includes parasites of fish (e.g., *Saprolegnia parasitica*) and (economically important plants (e.g., *Aphanomyces*

Contains both unicellular species and true fruiting species

Asexual reproduction: via biflagellate zoospores produced from cylindrical sporangia

Sexual reproduction: oogamous, with oogonia containing more than one egg

Order: Peronosporales

Most species live on plants as facultative or obligate parasites, with some occurring in soil or air

Hyphae are coenocytic (non-septate) and branch within host cells, forming haustoria to absorb nutrients

Sporangia detach from the hyphae upon maturation and disperse via wind or germinate directly under dry conditions



# Department of biology



## Families and Genera

### 1-Family: Pythiaceae

Cause plant diseases such as root rot and damping-off, and are commonly found in moist soils

Genus *Pythium*: Requires high moisture, parasitizes higher plants, mostly homothallic in sexual reproduction

Genus *Phytophthora*: Similar to *Pythium*, but sporangia are more conspicuous and branched; causes serious diseases like potato blight and citrus gummosis

### 2-Family: Albuginaceae

Obligate parasites causing white rust in flowering plants

Genus *Albugo*: Produces clustered, club-shaped sporangia beneath the host epidermis, forming motile or directly germinating spores depending on environmental conditions

### Family: Peronosporaceae

Obligate parasitic fungi causing downy mildew diseases

Genus *Plasmopara*: Highly branched, parasitic within host cells, producing biflagellate zoospores and branched sporangia

Genera *Peronospora*, *Bremia*, *Basidiophora*, *Sclerospora*: Differ in sporangial branching patterns and spore dispersal methods



## Life Cycle

Most species reproduce asexually via motile spores and sexually through oogonia and antheridia, producing oospores resistant to adverse conditions

Disease spread depends on humidity and temperature, with infections being more severe in moist environments.

## Characteristics of Oomycetes :

1. Most oomycetes live in **water**, but some grow in **soil**, and others attack the **stems or shoots of land plants**.
2. **Body Structure**
  - Primitive forms are **unicellular**
  - Advanced forms have a **well-developed, branched, thread-like structure (filamentous) with multiple nuclei in a single continuous cell (coenocytic mycelium)**.
  -
3. **Cell Wall**
  - The cell wall is mainly made of **cellulose- $\beta$ -glucan**.
  - **Chitin is completely absent** (chitin is found in true fungi).
4. **Asexual Reproduction**
  - In primitive aquatic forms, **zoosporangia** (spore-producing structures that release swimming spores) are **not clearly separated from normal hyphae**.
  - In advanced forms, **distinct zoosporangia** are present.



## Department of biology



- Some oomycetes also produce **non-motile asexual spores called conidia**.

### 5. Growth Pattern

- Most oomycetes are **eucarpic**: only part of the body produces spores.
- Members of the order **Lagenidiales** are **holocarpic**: the entire body transforms into spores.

### 6. Sexual Reproduction

- Sexual reproduction is **oogamous**, meaning there is a **large female cell (oogonium)** and a **small male cell (antheridium)**.
- The sexual organs can be **terminal** (at the tip of the hypha) or **intercalary** (in the middle of the hypha).

Many terrestrial Oomycetes cause serious plant diseases such as late blight of potato , downy mildew of grape - wine , white rust of crucifers , damping off of seedlings and others .

\*Late blight of potato and downy mildew of grape - vine are historically very important . The late blight of potato resulted in Irish Famine ' in The mid - 19th century that caused death of millions of people in Europe .

\* Downy mildew of grape - vine helped Prof. Millardet to discover the first fungicide called ' Bordeaux mixture ' .

\*Many members of this group help understand the evolutionary migration of fungi from aquatic to terrestrial environments .



# Department of biology





# Department of biology





# Department of biology





# Department of biology



# Department of biology

