



# **Fungi & Parasites**

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# Fungi

- Eukaryotic lack of chlorophyll
- Cell wall made of chitin
- Heterotrophs and major decomposers
- Body is made of long filaments of hyphae which form a mycelium.
- Reproduce sexually and asexually
  - Asexually by spores
  - Sexually by mating of hyphae filaments.



# ECOSYSTEM ROLES OF FUNGI

- Recycling
- Mycorrhizae
- Food
- Medicine
- Biocontrol
- Plant & Animal disease



# FUNGI TAXONOMY

## MUSHROOM TAXONOMY

**KINGDOM:** FUNGI, MYCETAE

**Division:** Eumycota, the true fungi

**Class:** Hymenomycetes, specialized spore layer

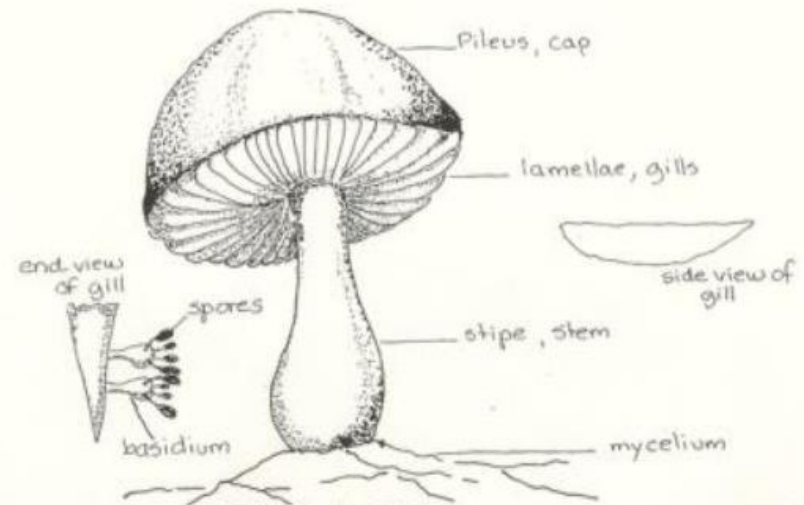
**Order:** Agaricales, having gills

**Family:** Agaricaceae, type family of the order

**Genus:** Agaricus, type of the family

**Species:** bisporus, brunescens

**Dark Clouds Of Flies Gather Seasonally**





# MOST COMMON FUNGAL DISEASE

- Fungal nail infections → common infections of the fingernails or toenails
- Vaginal candidiasis → caused by the yeast *Candida*
- Ringworm → common fungal skin infection looks like a circular rash.
- Candida infections of the mouth, throat, and esophagus

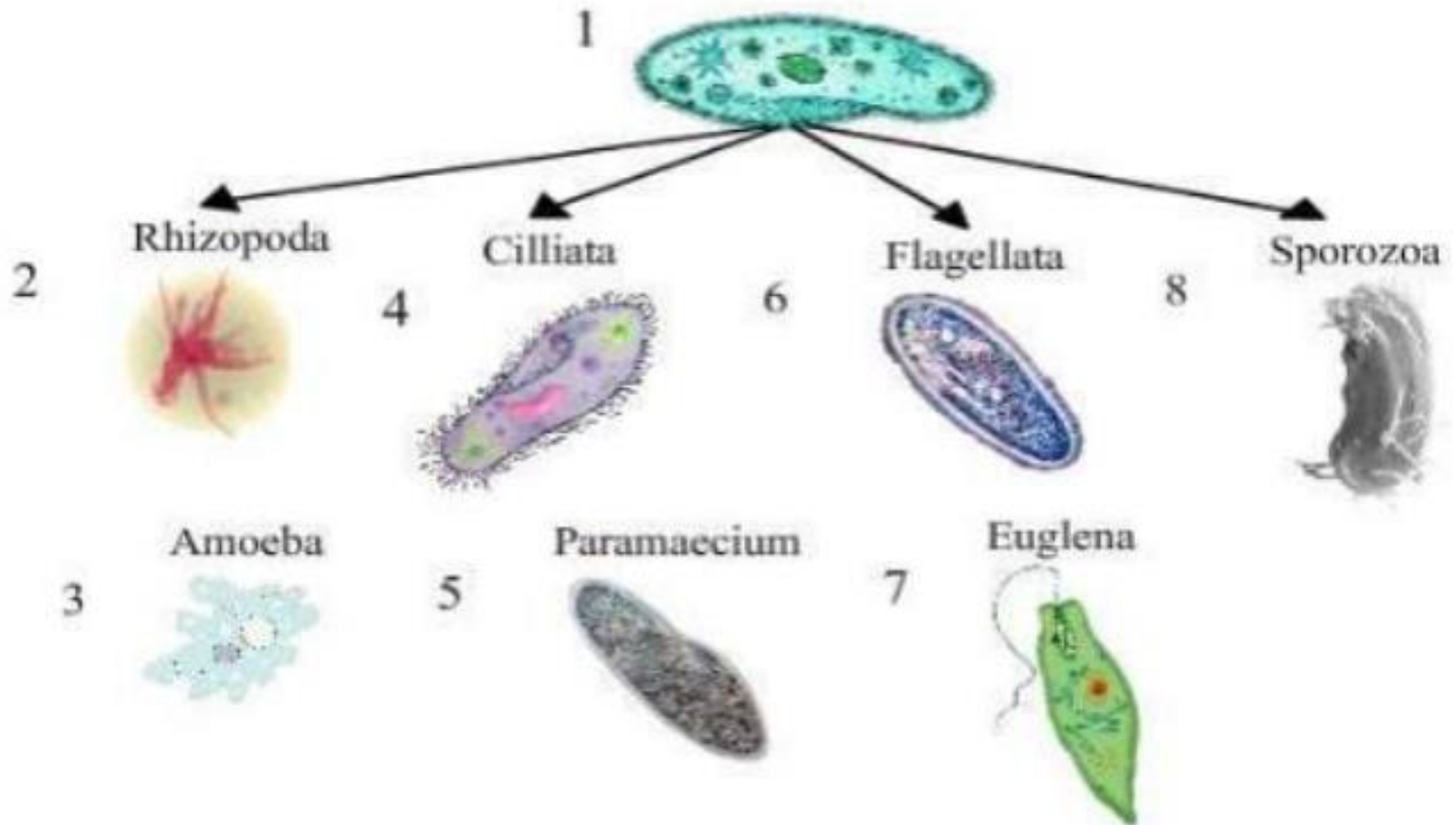


# PROTOZOA

The phylum protozoa is classified into 4 subdivisions according to the methods of locomotion.

1. The amoebae (sarcodina) move by means of pseudopodia.
2. The flagellated (mastigophora) typically move by long, whiplike flagellae.
3. The ciliates (ciliate) are propelled by rows of cilia that beat with synchronized wavelike motion.
4. The sporozoans (sporozoan) lack specialized organelles of motility.

# PROTOZOA



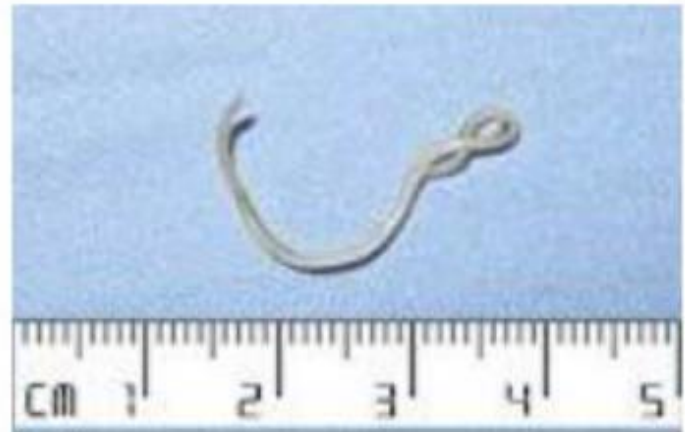
# HELMINTS

- Worm classified as a parasite
- Contaminate food, water, air, feces, pets, wild animals, toilet seats and door handles
- Prevention:
  - Frequent hand washing
  - Frequent cleaning of bathrooms and kitchens
  - Thorough cooking of beef, pork, sausage, and bear meat.



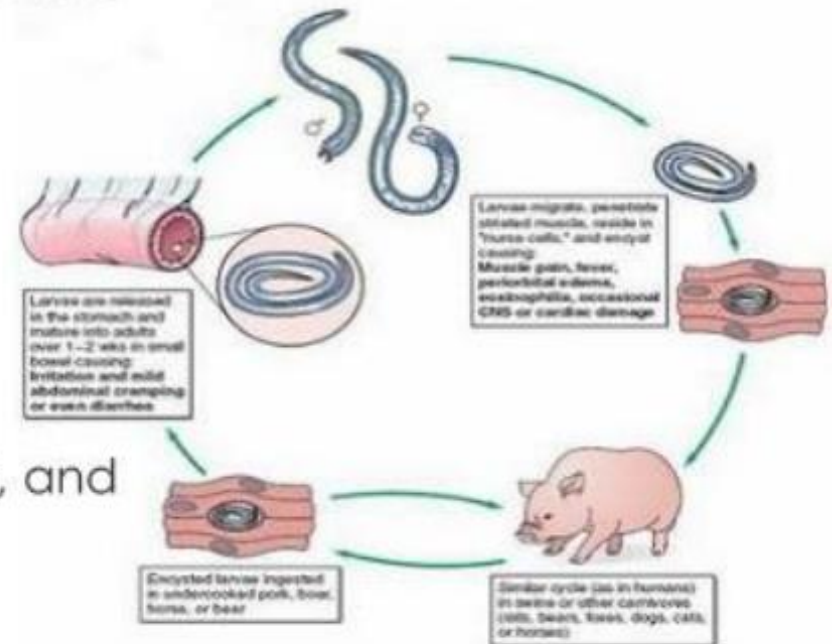
# Common helminths

- Roundworm
  - Hatch/live in intestines
  - Symptoms
    - fatigue,
    - Weight loss
    - Irritability
    - Poor appetite
    - Abdominal pain
    - Diarrhea
  - Untreated
    - Anemia
    - malnutrition



# Common helminths

- *Trichina spiralis* (trichinosis)
  - Ingested via undercooked pork, sausage, or bear meat
  - Spread throughout bloodstream and lymphatic system
  - Symptoms
    - Vomiting
    - Diarrhea
    - Muscle cramps
  - Untreated
    - Penetration of muscles, heart, and brain
    - Death



# Pinworms

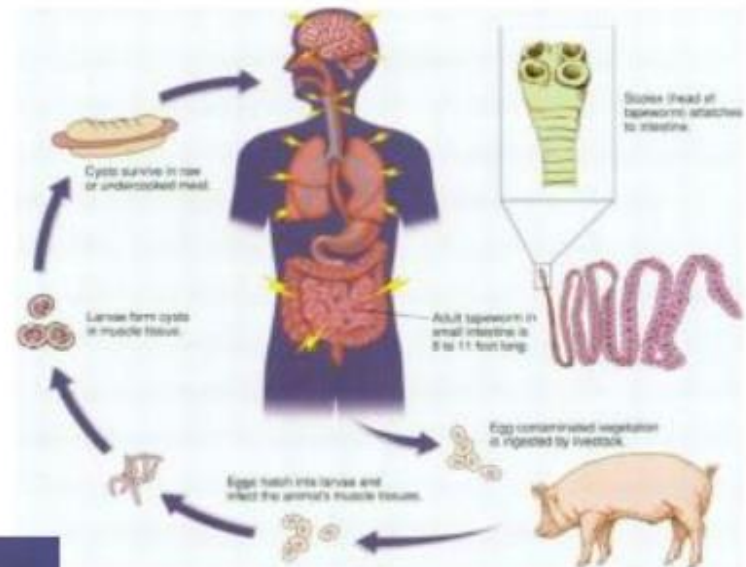
- AKA: seatworms or threadworms
- Most common in US
  - 42 million people
  - Mostly children aged 5-14 years
  - Commonly institutional settings such as child care facilities, hospitals, or family members
- Only helminthic infection with approved OTC treatment



# Common helminths

## ■ Tapeworms

- Ingested via undercooked beef
- Live in intestines
- Symptoms
  - Usually absent
  - May include abdominal pain, fatigue, weight loss, diarrhea



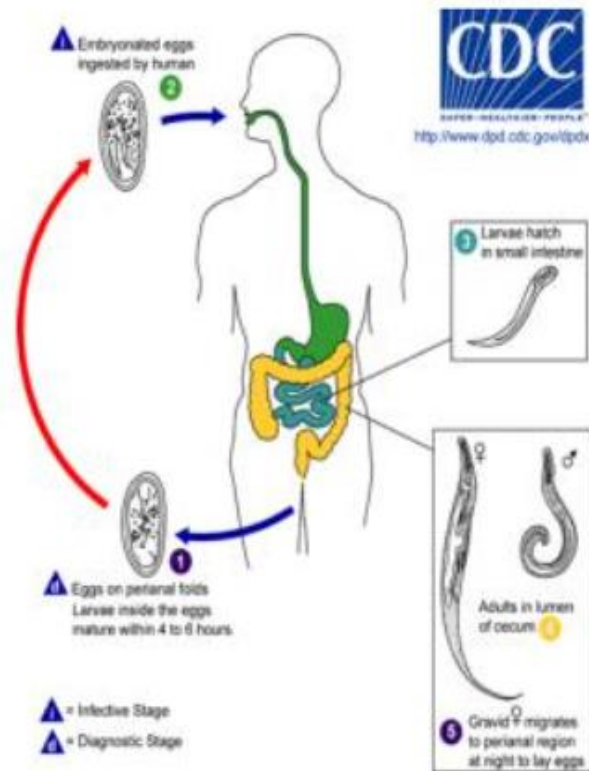


# Pinworm transmission

- Embryonated eggs are on clothes, bedding, bathroom fixtures or dust.
- Embryonated eggs are ingested (fingersucking is considered a source of infection).
- Reinfection occurs by direct anus to mouth transfer, with eggs found under fingernails of children who have scratched the anal area.



# Pinworm lifecycle



1. Adult males and females inhabit ileocecum.
2. Female migrates out of anus and deposits eggs in perianal region then dies.
3. Eggs hatch within a few hours and larvae return to large intestine via anus (retroinfection), crawl into genitourinary tract, or eggs are reingested by the host.

# Diagnosing Pinworms



- Visual inspection
  - With a flashlight, inspect the anal area during early morning hours while child is asleep
- Cellophane tape sample
  - Using a tongue depressor, apply the sticky side of a piece of tape to the perianal area and then to a glass slide, sticky side down. Commercial kits are available. The sample undergoes microscopic examination by a physician.

# Prescription therapy

- Mebendazole (Vermox):
  - Adult / pediatric > 2yrs: 100mg x 1 dose
  - Repeat in 2 weeks if symptoms do not resolve
  - Indications: roundworm, pinworm, hookworm, trichinosis, some tapeworms
  - MOA: blocks glucose uptake by parasite until death ensues
  - Precautions:
    - Pregnancy (category C) – animal studies showed teratogenic effects
    - Breast feeding – excretion into breast milk is unknown
    - Hepatic disease (eliminated by liver)
    - Inflammatory bowel disease





*Thank you*