

Introduction to

Parasites



Amoeba



Fish Tape worms



Hook worms



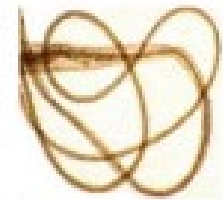
Flukes



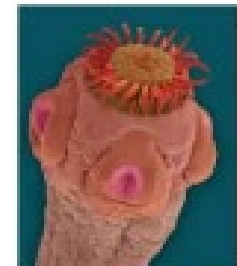
Dwarf Tapeworms
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Pin worms



Whip worms



As long as the head survives, the tapeworm will continue to grow and shed segments
Tapeworm Mouth

4th stage –Biology Dept.

2024-2025

Lecture 1




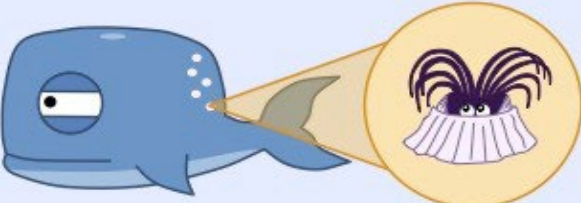


Introduction

- **Parasite** is an organism baring food and shelter temporarily or permanent and living **IN** or **ON** another organism.
- **Parasitism:**
organism depend upon another for living, one is living at the expense of the other and harmful, called **Parasite**, the other organism is called **Host**.
- The study of parasites is called **Parasitology**.
- **Clinical Parasitology:** deals with animal parasites of man and their medical importance.

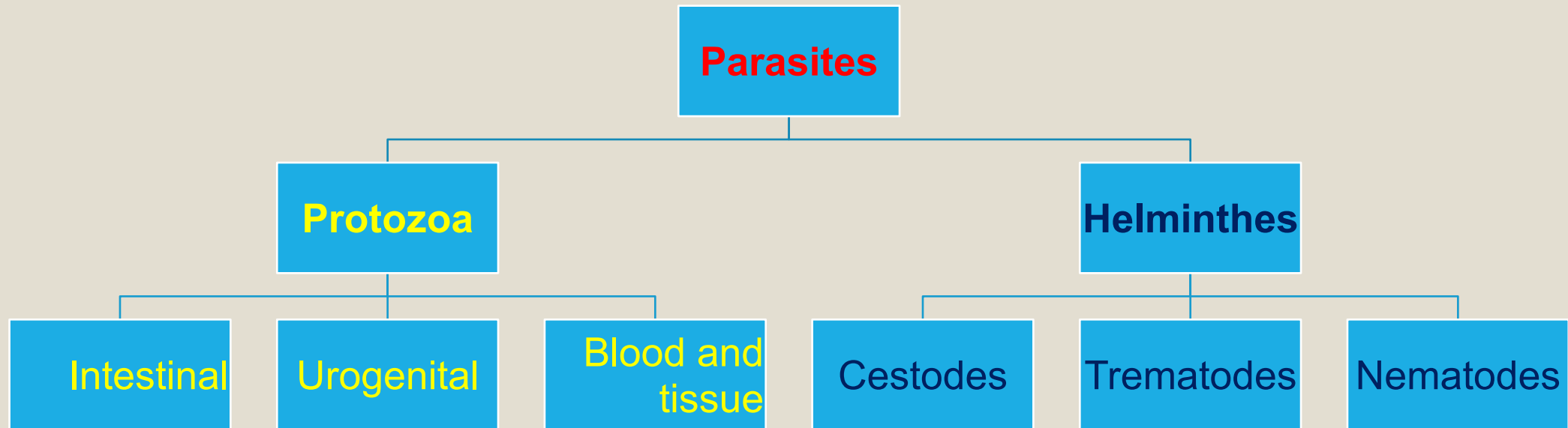
Relationships between organisms:

- **Symbiosis:** permanent association between two organisms
- **Mutualism:** two organisms living together, the two organisms benefit.
- **Commensalism:** Two organisms Living together, one is benefited and the other is not been affected.
- When the other organism become affected, then the relationship turns = **Parasitism.**
- **Zoonosis:** disease of animals but can be transmitted to a man. Ex: *Hymenolepis nana*.

- **Mutualism** – Both species benefit from the interaction (anemone protects clownfish, clownfish provides fecal matter for food)
- **Commensalism** – One species benefits, the other is unaffected (barnacles are transported to plankton-rich waters by whales)
- **Parasitism** – One species benefits to the detriment of the other species (ticks and fleas feed on the blood of their canine host)

INTERACTION	TYPE OF SYMBIOSIS	EXAMPLE
 <p>Benefits Benefits</p>	<p>Mutualism Species A benefits Species B benefits</p>	 <p>Sea anemone Clown fish</p>
 <p>Benefits Unaffected</p>	<p>Commensalism Species A benefits Species B unaffected</p>	 <p>Whale Barnacle</p>
 <p>Benefits Harmed</p>	<p>Parasitism Species A benefits Species B harmed</p>	 <p>Dog Tick</p>

Classification of parasites



What is the Difference Between Protozoa and Helminths

The main difference between protozoa and helminths is that the **protozoa** are unicellular **protists** whereas **helminths** are metazoa that is multicellular worms.

Furthermore, **protozoa** undergo both asexual and sexual reproduction while **helminths** undergo sexual reproduction.

Protozoa and **helminths** are two forms of eukaryotic organisms that are parasitic on plants and other animals.

Types of Parasite

- Ectoparasite

- Live ON the surface of their body hosts

- Endoparasite

- Live IN the body (inside) of their hosts

- Access to hosts by:

- Consumption of contaminated food
- Penetration of the skin by infective stage during contact with contaminated soil and water
- Inoculation by an infected hematophagous vector

- Obligate parasite

- Cannot exist outside of their host

- **Facultative parasite**
 - Living free but can transfer into parasites when accidentally ingested or enter the host through wound or openings of the body.
- **Permanent parasite**
 - Spend their entire life within their hosts.
- **Temporary/intermittent parasites**
 - Associate into their host only when feeding and then leave them after -
Bedbugs
- **Accidental/Incidental parasites**
 - Enter or attach to the body of host that are different from their preferred hosts.
 - *Toxocara* – causes serious visceral migrans.

○ **Host:** organism harboring the parasite species may be affected or not.

○ Classification of Hosts:

1-Definitive host:

harbors the adults or final stages or sexual stages (♂♀)
in the development of parasite ex: man.

2-Intermediate host:

in which you have the larva stages or Inter mediate
stages in the development.

○ **Ex:** *Taenia* SP. adult----- man
 Larva ---- cattle

3-Reservoir host (carrier):

the carrier host is well adapted to the parasite and tolerates the
infection but serve as source of the infection to other organisms.

Vectors

- They are intermediate hosts that introduce the infective stages of the parasite to the definitive host through their bites for their blood meal.
- **Mosquitoes** – malaria and filariasis
- **Sandflies** – Leishmaniasis
- **Tsetse flies** – African trypanosomiasis
- **Triatomid bug** – American trypanosomiasis

Diagnostic stages that escapes the human host can be detected from these samples:

- Feces
- Sputum
- Blood
- Tissue biopsies

Tools for detection of diagnostic stages:

- Microscopy (gold standard)
- Serologic technique (antigen & antibodies)
 - Serum
 - Saliva
 - Feces
- Molecular means by DNA detection
 - Feces
 - Blood

Sites of parasitic infections

- Respiratory tract

- Specimen: sputum & aspirates
- Detect: *Pneumocystis carinii*, *Cryptosporidium parvum*, *Echinococcus spp.*, and *Microsporidia*

- Gastrointestinal tract

- Specimen: feces & aspirates (duodenal contents), fresh stool
- Parasites: protozoans, nematodes, and trematodes
- Developmental stages: cyst, trophozoites, oocysts, spores, adult, larvae, and eggs

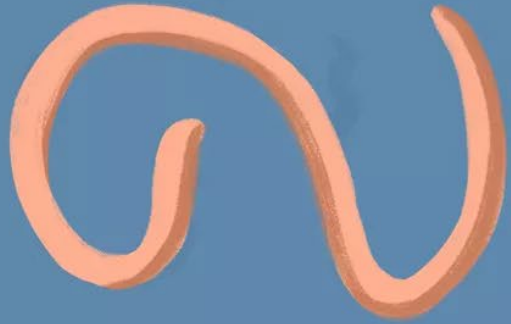
- Tissue biopsy

- Histologic preparations and impression smears
- Skin, muscle, cornea, intestine, liver, lung, and brain

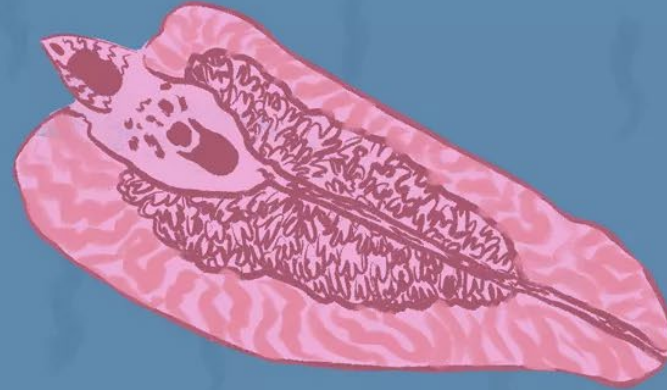
- Blood

- Collected through venipuncture and finger puncture and processed either through thin film, thick film, and blood concentrations.

Types of Helminths (Parasitic Worms)



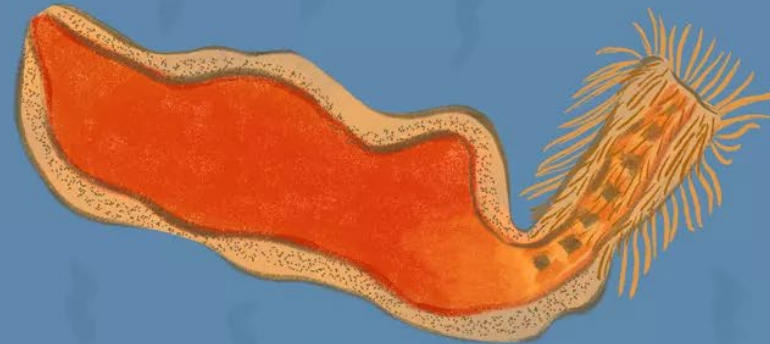
Roundworms : Can cause infection in the intestines or the body



Flukes: Generally infects the bile ducts, liver, or blood

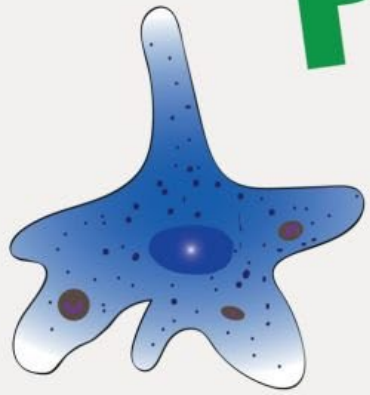


Tapeworms: Infects the intestines

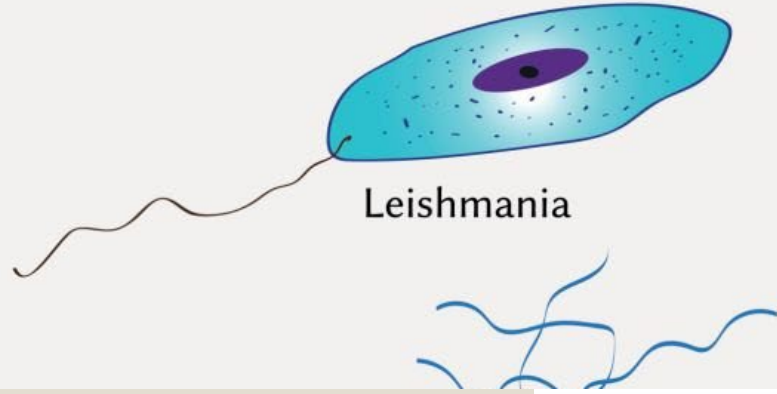


Thorny-headed worms: Mainly infects animals, rarely can infect humans

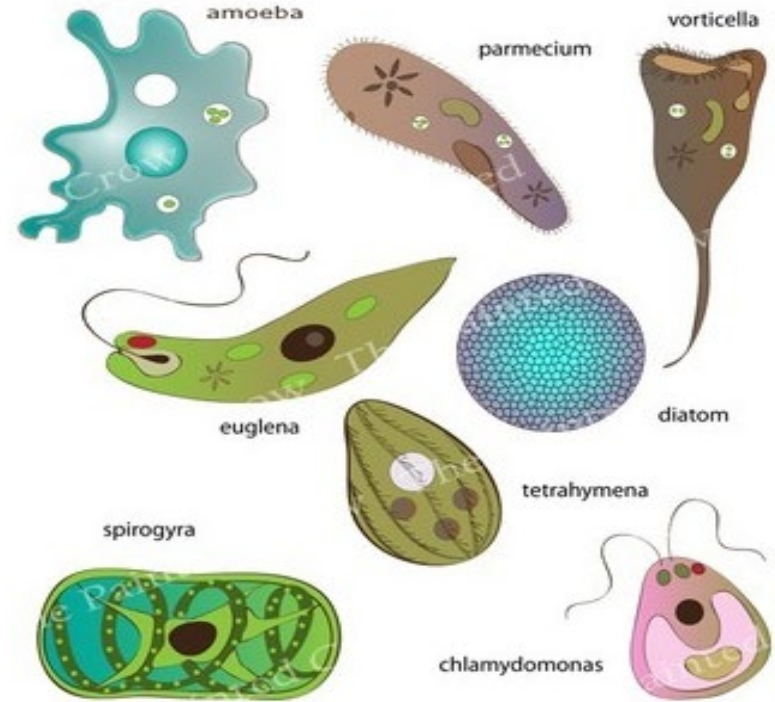
Protozoa



Entamoeba histolytica



Leishmania





THANK YOU