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المرحلة الثالثة



# الطفيليات الابتدائية

*Protozoan Parasites*

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## Parasitology

### Introduction to Parasitology:

#### Definitions:-

1. **Parasite:** is an organism that obtains food and shelter from another organism and derives all benefits from this association
2. **Parasitology** :- the science or study of host-parasite relationships.
3. **Medical parasitology:** study of parasites which infect humans.
4. **Vector:** “carrier” of a parasite from one host to another. Often an insect.
5. **Host:** the partner providing food and/or protection. Some parasites require more than one host to complete their life cycle; or may not require a host during some stage(s).

#### Types of host:

- a. **definitive host:** the host in which sexual maturity and reproduction takes place. Man is usually a definitive host.
- b. **intermediate host:** harbors the larval stages of the parasite or an asexual cycle of development takes place. In some cases, larval development is completed in two different intermediate hosts, referred to as first and second intermediate hosts (malaria).
- c. **Reservoir (carrier) host:** a host that makes the parasite available for the transmission to another host and is usually not affected

by the infection

- d. **Natural host**: a host that is naturally infected with certain species of parasite.
- e. **Accidental host**: a host that is under normal circumstances not infected with the parasite.

**Symbiosis**: “living together,” a close association between two organisms.

**This relationship may be characterized as:-**

- a. **mutualism**: both organisms are benefited (bacteria in bowel)
- b. **commensalism**: “eating at the same table”; one organism is benefited, the other is unaffected.
- c. **Parasitism**: one organism is benefited at the expense of another (host).

### **DIFFERENT KINDS OF PARASITES:**

- **Ectoparasite**: a parasitic organism that lives on the outer surface of its host, e.g. lice, ticks, mites etc.
- **Endoparasites**: parasites that live inside the body of their host, e.g. *Entamoeba histolytica*.
- **Obligate Parasite**: This parasite is completely dependent on the host during a segment or all of its life cycle, e.g. Plasmodium spp.
- **Facultative parasite**: an organism that exhibits both parasitic and non-parasitic modes of living and hence does not absolutely depend on the parasitic way of life, but is capable of adapting to it

if placed on a host. E.g. *Naegleria fowleri*

- **Accidental parasite**: when a parasite attacks an unnatural host and survives. E.g. *Hymenolepis diminuta* (rat tapeworm).
- **Erratic parasite**: is one that wanders in to an organ in which it is not usually found. E.g. *Entamoeba histolytica* in the liver or lung of humans.

### **Effects of the parasite on the host:**

Parasitic damage to host:

1. trauma - damage to tissues, intestine, liver, eye.
2. lytic action - activity of enzymes elaborated by organism.
3. tissue response - localized inflammation, eosinophilia.
4. blood loss - heavy infection with hookworm may cause anemia.
5. secondary infections - weakened host susceptible to bacterial infection, etc.

### **SOURCES OF PARASITIC INFECTIONS**

Parasitic infection may happen by many ways such as:

1. **Damp soil**: It contains worm's eggs or protozoan cysts.
2. **Contaminated water**: It contains protozoan cysts, helminthes egg, worm larvae and else.
3. **Vegetables, Food and Meat** :It is food that contaminated by worms eggs, encysted larvae of worms, or protozoan cysts, it may be the uncooked well meat or unwashed vegetables and fruits.

**4. Animals** :that lives with man such as dogs, cats, rats and else, also Arthropods which transport the parasitic infection mechanically or biologically.

**Methods or mode of infection**

1. Mouth
2. Skin (Touch, Penetration).
3. of contaminate dust
4. Placental.
5. Vaginal or Anal.
6. Blood.

**Types of specimens which can be examined for diagnosis of parasites:**

€ Stool -€ Blood -€ Urine € - Sputum -€ Cerebrospinal fl uid (CSF) € Tissue and aspirates € - Genital specimens..

**Specimen Collection**

1. Collect in a clean container - without urine or water (these may be damaging to trophozoites. The entire passage is desirable (this allows for a thorough macroscopic examination).
2. Minimum number of specimens - due to irregular shedding patterns of parasites, a series of three normally passed specimens is preferred.
3. Time frame of collection - Collect on alternate days. Never on same day.

4. Use of laxatives is not permitted - these can mask infection or damage organisms.
5. Exact date and time of collection - important, required information.
6. Proper performance of diagnostic testing is critical - no shortcuts!  
Follow the procedure, do not modify it for convenience.

### **Techniques of Stool Examination:**

- A. Gross examination.
- B. Direct Wet Mounts (fresh or formalin preserved specimens).
- C. Stained Wet Mounts.
- D. Concentration Techniques.
- E. Identification by Molecular Methods.
- F. In Vitro Cultivation of Parasites - primarily used for blood & tissue protozoa. Can culture intestinal protozoa, but not generally done.
- G. Animal inoculation.

### **Use of Other Specimens:**

- A. Anal Swabs / Scotch Tape Preparation for *Enterobius vermicularis* - must be collected in the morning prior to bathing or bowel movement.
- B. Genital Specimens for *Trichomonas vaginalis* - vaginal, urethral, prostatic exudates are examined via wet mounts, looking for motile organisms.