

➤ **Definition Parasitology :**

Parasitology is the sciences deals with parasites which live temporarily or permanently, on or within the human body (host) & their pathogenic effects.

Human parasites are either unicellular (protozoa) or multicellular (helminthes and arthropods). The parasites may live inside the host (endoparasites) or on the host surface (ectoparasites).

➤ **Parasites :** Is an organism adapted to live on or in other organism (host).

➤ **Types of parasites:**

According to the nature of the host-parasite interactions and the environmental factors, the parasite may be one of the following types :

- 1- **Ectoparasite** –a parasitic organism that lives on the outer surface of its host, e.g. lice, ticks ..etc.
- 2- **Endoparasites**– parasites that live inside the body of their host, e.g. *Entamoeba histolytica*.
- 3- **Obligate Parasite**- Parasites that are entirely dependent on their hosts & cannot live outside the host, e.g. *Plasmodium* spp.
- 4- **Facultative parasite** – Parasites that are capable of living either free or in or on a host . E.g. *Naegleria fowleri*
- 5- **Accidental parasite** – when a parasite attacks an unnatural host and survives. E.g. *Hymenolepis diminuta* (rat tapeworm).
- 6- **Temporary Parasite**:- Parasitic only during part of its life cycle.
- 7- **Permanent Parasite**:- Live parasitically during the whole life cycle.
- 8- **Pseudoparasite**:- Is an object that resembles a parasite or the egg of a parasite but it is not a parasite (called **artifact**) this is include yeast, hairs, spores...
- 9- **Wandering parasite**: Parasite reaches a place where it cannot live.
- 10- **Pathogenic Parasite**:-Causing injury to the host.

- **Host** : The organism which harbors the parasite.

Hosts are classified according to their role in the life cycle of the parasite into:

- 1- **Definitive host** –a host that harbors a parasite in the adult stage or where the parasite undergoes a sexual method of reproduction.
- 2- **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.
- 3- **Temporary host** – the host which harbors the parasite for a short time.
- 4- **The vector** – is an organism which belong to the arthropods or insect which transmit the parasite from one host to another.
- 5- **Paratenic host**: is a carrier or transport host where the parasite remains viable without further development.
- 6- **Reservoir host**: Is an animal species on which the parasite depends for its survival in nature & acts as a source of infection for other hosts including man. e.g. cutaneous *Leishmania* & its reservoir host is the dog.

- **Host-Parasite relationship**:-

The relationship between two living organisms may be one of the following:-

1- **Symbioses** :

The relationship between two dissimilar organisms adapted to living together & lost the ability to live alone.

2- **Commensalism** :

The relationship between parasite & host, when one of the associated is benefited & the other (host) neither benefited nor harmed. e.g. *E. coli* Bacteria live in human colon but doesn't cause trouble to human.

3- **Parasitism** :

The relationship between two organisms in which one of them get the benefit from the host and harming it in different condition. e.g. *E. histolytica*

➤ **Binomial nomenclature :**

Every organisms (parasite- bacteria- and viruses) is written by two names. All these names must be of Greek or Latin origin.

The first is **genus name** which start by capital letter and **species name** which start by small letter by the name of scientist who discovered the organism followed by the year of discovery.

Ascaris lampercoides Linnaeus 1758

Leishmania tropica Borousky 1898

Mycobacterium tuberculosis kokh 1882

➤ **Life cycle and type of life cycle :**

-Life cycle : The whole process of parasite growing and developing.

1- The direct life-cycle : Only one host (no intermediate host).

2- The indirect life cycle : Life cycle with more than one host (intermediate host and final host).

➤ **• Parasitic disease may be grouped epidemiologically as follows (mode of infection):**

- 1) Filth-borne or contaminative:** Like intestinal protozoa, helminthes, louse infestation.
- 2) Contaminated soil or water:** Like eggs of *Ascaris* & *Trichuris*, or through the skin as with the infective larvae of hook worms or blood flukes.
- 3) Food-borne infections:** Like *Taenia spp.* Eating raw or under cooked meat containing the larval stage of the parasite. Also ingestion of encysted larvae on aquatic plants.
- 4) Arthropods-borne infection:** Like Malaria, Leishmania, Lice.

➤ **Diagnosis:**

Diagnosis of parasitic diseases depends on 2 parts:

1) **1st. Clinical features:** like fever, pain

2) **2nd. Laboratory diagnosis to:**

- a) Detect the presence of eggs, larvae, cysts (in stool, urine, blood sputum).
- b) Distinguished these stages from each other.
- c) Find out whether it is the causative agent or coincidental.

➤ **Other Terms in parasitology :**

- ✓ **Infection** : is the establishment of parasite inside the body.
- ✓ **Infestation** : is the establishment of parasite on the body in the skin.
- ✓ **Zoonosis**: is a term applies to the disease which transmitted from animal to human either incidentally or commonly.
- ✓ Parasites that injury the host are **Pathogens**.
- ✓ The development of the damage called **Pathogenesis**.
- ✓ **Symptoms**: Are the manifestations of pathological process result from the effect of the agent.
- ✓ **Epidemiology**:Is the science concerned with factors which determine the prevalence of infection & incidence of disease.