

Atlas Of Parasitology: Volume 7 Akheel Mohammad

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to Parasitology

Parasitology is the scientific study of parasites, organisms that live on or in a host organism and get their food from or at the expense of their host.

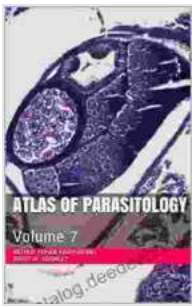
Parasites can be broadly divided into two groups: endoparasites and ectoparasites. Endoparasites live inside the host's body, while ectoparasites live on the host's body surface.

The study of parasites is important for several reasons. First, parasites can cause disease in humans and animals. Some of the most common

parasitic diseases include malaria, schistosomiasis, and hookworm infection. Second, parasites can damage crops and livestock, leading to economic losses. Third, parasites can be used as biological control agents to control populations of other organisms.

Protozoa

Protozoa are single-celled eukaryotic organisms that are found in a wide variety of habitats, including water, soil, and the bodies of animals and plants. Some protozoa are parasites, while others are free-living.



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The most common parasitic protozoa belong to the following groups:

- **Apicomplexans:** Apicomplexans are a group of protozoa that are characterized by the presence of a specialized structure called an apical complex. Apicomplexans include some of the most important human parasites, such as *Plasmodium* (which causes malaria) and *Toxoplasma gondii* (which causes toxoplasmosis).
- **Flagellates:** Flagellates are a group of protozoa that are characterized by the presence of one or more flagella. Flagellates include some of the most common human parasites, such as *Giardia lamblia* (which

causes giardiasis) and *Trypanosoma brucei* (which causes African sleeping sickness).

- **Amoebas:** Amoebas are a group of protozoa that are characterized by their ability to change shape. Amoebas include some of the most common human parasites, such as *Entamoeba histolytica* (which causes amoebic dysentery) and *Acanthamoeba* (which causes *Acanthamoeba keratitis*).
- **Ciliates:** Ciliates are a group of protozoa that are characterized by the presence of cilia. Ciliates include some of the most common human parasites, such as *Balantidium coli* (which causes balantidiasis) and *Paramecium* (which is a free-living protozoan that is often used in laboratory studies).

Helminths

Helminths are multicellular eukaryotic organisms that are found in a wide variety of habitats, including water, soil, and the bodies of animals and plants. Some helminths are parasites, while others are free-living.

The most common parasitic helminths belong to the following groups:

- **Platyhelminthes:** Platyhelminthes are a group of helminths that are characterized by their flattened bodies. Platyhelminthes include some of the most important human parasites, such as *Schistosoma* (which causes schistosomiasis) and *Taenia* (which causes taeniasis).
- **Nematodes:** Nematodes are a group of helminths that are characterized by their round bodies. Nematodes include some of the most common human parasites, such as *Ascaris* (which causes ascariasis) and *Trichuris* (which causes trichuriasis).

Ectoparasites

Ectoparasites are parasites that live on the surface of their host's body.

Ectoparasites can be divided into two groups:

- **Arthropods:** Arthropods are a group of invertebrates that includes insects, spiders, and crustaceans. Some arthropods are parasites, while others are free-living. The most common parasitic arthropods are lice, fleas, and ticks.
- **Non-arthropods:** Non-arthropods are a group of organisms that includes worms, mollusks, and leeches. Some non-arthropods are parasites, while others are free-living. The most common parasitic non-arthropods are leeches and scabies mites.

Arthropod-borne Parasites

Arthropod-borne parasites are parasites that are transmitted to their hosts by arthropods. Arthropod-borne parasites include protozoa, helminths, and bacteria.

The most common arthropod-borne parasites are:

- **Malaria:** Malaria is a parasitic disease that is caused by the protozoan *Plasmodium*. Malaria is transmitted to humans by mosquitoes.
- **Schistosomiasis:** Schistosomiasis is a parasitic disease that is caused by the trematode *Schistosoma*. Schistosomiasis is transmitted to humans by snails.
- **Filariasis:** Filariasis is a parasitic disease that is caused by the nematode *Wuchereria bancrofti*. Filariasis is transmitted to humans by mosquitoes.

- **Onchocerciasis:** Onchocerciasis is a parasitic disease that is caused by the nematode *Onchocerca volvulus*. Onchocerciasis is transmitted to humans by black flies.
- **Dengue fever:** Dengue fever is a viral disease that is transmitted to humans by mosquitoes. Dengue fever is a major public health problem in many tropical and subtropical countries.

Laboratory Diagnosis of Parasitic Infections

The laboratory diagnosis of parasitic infections is based on the identification of parasites in clinical specimens. The most common clinical specimens used for the diagnosis of parasitic infections are blood, stool, urine, and skin scrapings.

The following are some of the most common laboratory tests used for the diagnosis of parasitic infections:

- **Microscopy:** Microscopy is the most common method used to identify parasites in clinical specimens. Microscopy can be used to identify parasites in blood, stool, urine, and skin scrapings.
- **Serology:** Serology is a laboratory test that is used to detect antibodies against parasites in the blood. Serology can be used to diagnose past or present parasitic infections.
- **Molecular diagnostics:** Molecular diagnostics are laboratory tests that are used to detect the DNA or RNA of parasites in clinical specimens. Molecular diagnostics can be used to diagnose parasitic infections that cannot be diagnosed by microscopy or serology.

Clinical Parasitology

Clinical parasitology is the branch of medicine that deals with the diagnosis, treatment, and prevention of parasitic infections. Clinical parasitologists are physicians who have specialized training in the diagnosis and treatment of parasitic infections.

The following are some of the most common clinical manifestations of parasitic infections:

- **Fever:** Fever is a common symptom of parasitic infections. Fever is caused by the release of toxins from parasites into the bloodstream.
- **Diarrhea:** Diarrhea is a common symptom of parasitic infections. Diarrhea is caused by the irritation of the intestinal tract by parasites.
- **Abdominal pain:** Abdominal pain is a common symptom of parasitic infections. Abdominal pain is caused by the inflammation of the intestinal tract by parasites.
- **Weight loss:** Weight loss is a common symptom of parasitic infections. Weight loss is caused by the decreased appetite and increased metabolism that is associated with parasitic infections.
- **Skin rashes:** Skin rashes are a common symptom of parasitic infections. Skin rashes are caused by the allergic reaction of the skin to parasites.

Parasite Control and Prevention

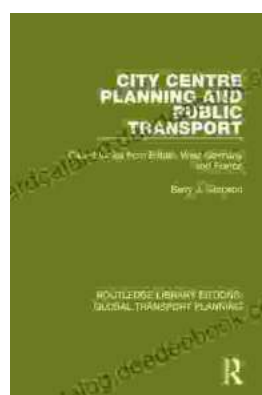
The control and prevention of parasitic infections is a major public health challenge. The following are some of the most important strategies for controlling and preventing parasitic infections:

- **Vector control:** Vector control is the control of arthropods that transmit parasites. Vector control can be achieved through the use of insecticides, repellents, and bed nets.
- **Sanitation:** Sanitation is the control of environmental factors that contribute to the transmission of parasites. Sanitation can be achieved through the provision of clean water and sanitation facilities, and the disposal of human waste.
- **Health education:** Health education is the provision of information about



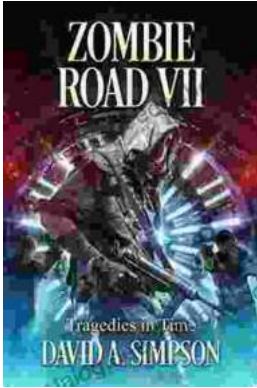
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