Location of parasites

Parasites can be broadly categorised according to their location on or in of their host.

a*) Ectoparasites*: these live or feed on the surface of the host, or embed themselves into superficial or adjacent underlying tissues. Ectoparasites engage in host-parasite asccoations ranging from flies that land fleetingly to feed on secretions from the eyes, nose or other orifices to mites that spen nearly their whole lives in skin tunnels.

b) *Endoparasites:* these live within the body of the host. Parasites may be found in every tissue expect, perhaps bone and keratin.

A fundamental distinction that influences both of pathogenesis and options for control is the relationship of the parasites to the tissue it inhabits.

a*) Extracellular parasites*: these live on or within host tissue but do not penetrate into host cells. Examples include almost all metazoan and also many protozoan parasites.

b) *Intracellular parasites:* these live inside a host cell modifying its genomic expression to cater for their needs, e.g. many protozoan parasites and at least one nematode genus (*Trichinella*).

Parasites can also be differantiated on the basis of their reproductive behaviour in the final host. This distiction is useful as it points towards fundamental biological differences that influence pathogenesis, epidemiology, control and treatment.

a) *Microparasites:* these multiply within their host. Consequently, each organism that enters the body iscapable of initiating a massive infection if not checked by the host defences or by chemotherapy. This category includes the parasitic protozoa.

b) *Macroparasites:* these do not generally increas in number while they are on or within final host. They may produce eggs or larvae but these are dispersed into the environment. Thus, the number of mature parasite on or in the final host never exceedes the number of infective units that originally invaded the body. This category includes arthropods and helminths, although there are a few species that break the general rule by multiplying on or in tje host (for example licei mites and a few nematodes, e.g. some *Strongyloides* species).

Hosts

Some parasites require just one host to complete their development cycle and produce progeny. Others utilise two or more animals. Host can be exploited in different ways and the following terminology is used to differentiate between these:

a) *Definitive (or final, true) host*: a term used to identify the host in which sexual reproduction or adult form of the parasite take places.

b) *Intermediated host:* this is a host in which only immature stages grow and development. Asexual replication may ocur (but not sexual reproduction). In other words, an intermediated host is one in which required for the parasites development but one in which parasites do not reach sexual maturity or adult form.

c) *Paratenic and transport hosts:* no parasitic development of any kinds take place in these and they are not a necessary part of life – cycle. The parasite takes advantage of another animal by using it as a vehicle to increase its chances of reaching its next essential host. The word 'paratenic ' implies an intimate reiationship in which the parasite becomes embedded within the tissue of its host. The corresponding association with a transport host is more causal and often passive in nature. The two terms are sometimes used interchangeably with less precision.

In parasitology, the term paratenic host describes a host that is not necessary for he development of a particular species of parasite, but nonetheles happen to server of maintain the life cycle of that parasite. A parasite does not undergo any changes into the development stage of its development. Paratenic hosts may be bridge ecological gap between parasites and their final hosts.

Toxocara canis may serve as example; larval stages of this parasite reside in rodents such as mice and rats, and different animals such as sheeps, pigs, chickens and eartworms. The larvae may not undergo further development in these animals.

d) *Vector:* this is a organism that transmit parasites from host to host is termed vector. This a term for insect and ticks that carries (transmits) a parasitic disease from one host to another host. A biological vector is required in the life cycle of parasite. In parasitology, a disease vector is one in which infectious parasitic pathogen agents such as especially protozoan are transmitted into any host. A major group of parasitic vectors is encompassed *Arthropods* such as mosquitoes, flies, lice sand flies, ticks, fleas and mites. Many vectors are haematophageous, feed on blood at some or all stages of their life. When the insects feed blood, pathogens enter the blood stream of the host.

e) *Reservoir host:* Organism in which parasites that is pathogenic for some other species lives and multiples without doing serious damage to its host. A single reservoir host may be reinfected several times.

Life – cycles of parasites

The parasitic animals do not live indepent life, as other animals do. It must, at the same during life cycle, leave one host and make to contacting and establishing a parasitic association with another host. It is to this necessity of passing from one host to another that the terms direct and indirect life cycle refer. Life – cycles are described as being: indirect (or heteroxenous) life cycle, and direct (or monoxenous) life cycle.

Direct life cycle (monos: alone, xenos: guest, foreigner) , means that all prepasitic stage of the parasite are found free-living in the environment and their development may take place either inside the egg or after hatching in the development.

For examples: in *nematodes*, the members of the family *Trichostrongylidae*, the first stage larvae from their eggs subsequent development take place in the environment and second larvae and third larvae (as infected stage fort he definitive host) of the parasitesealso development free-living in the environment.

For example: in *nematodes*, *Toxocara canis*, roundworm of dogs, where the eggs of these parasites do not hatch, parasitic larval development inside their eggs so that the infected stage for the definitive hosts is an egg containing an infected larva. Hatching will take place after these eggs are eaten by definitive host and infected larva escapes in the body of definitive host.

Indirect life cycle (hetero: the other, xenos: guest, foreigner) , means that the parasitic larvae develop to the infected stage inside an appropiate intermediate host. In this life cycle, an intermediated host is involved. In this life cycle, there are two possible ways of transmission of infective larvae to the definitive host.

1) The intermediate host, in which found the infected stage of parasite, is ingested by definitive host or the infected stages are released by intermediate host are found freely in the environment (so these larvae on ground or in water), and these infected larvae are ingested by definitive host.

2) The intermediated host is a biting or sucking arthropods. Transmission of the infected larvae of parasites occurs during feding on the definitive host.

Sometimes, the parasites have to both direct and indirect development types at the same time.

For example: Hymenolepis (Rodentolepis) nana: this tapeworm lives in the small intestine of rodents, humans and primates, and has to both direct and indirect life cycle.

In direct life cycle, the cysticercoids (as larval form of paraistes) are developed in the villi of small intestine of the definitive host and then are developed to the adult tapeworm in the intestnal lumen. In indirect life cycle, otherwise, flour beetles or fleas can serve as intermediate hosts in which found the cysticercoids of *Hymenolepis nana*.