Introduction to Helminths (Metazoa)

The term helminth has been derived from a Greek word meaning worn. It was originally meant to refer to only intestinal worms, but now includes tissue parasites as well as many free living species. These are metazoa.

Classification of helminths

The metazoa are classified into two phyla: Platyhelminthes and Nemathelminthes. Platyhelminthes divided into two classes: Cestodea (tapeworms) and Trematodea (flukes) while Nemathelminthes has only one class Nematodea (roundworms).
General characteristics of helminths

1. They do not possess organs of locomotion, so locomotion is by muscular contraction & relaxation.

2. The outer covering, known as cuticle or integument. It is situated on its outer surface & may be armed with spines or hooks. It is resistant to intestinal digestion.

3. Nervous system and excretory system are primitive.

4. Digestive system is complete, partially lost (rudimentary) or absent. The alimentary tract has entirely disappeared from all stages of the tapeworms (cestodes); it is greatly or nearly absent in many of the trematodes, but its present and complete in most nematodes. The digestive system is partially lost (rudimentary) or absent in certain parasitic helminths because of their location in the hosts (intestine or tissue), where predigested nutrient are abundant.

5. Reproductive system is very well developed.

6. They may be monocious or diecious. Both self-fertilization and cross-fertilization may take place.

7. Reproduction to increase the parasite population within the same host (internal autoinfection) does not occur among certain helminths; more over under usual conditions of host & environment, the number of worms that reach maturity in any given host is limited levels that are tolerable to both host & parasite. Thus most of the people who are infected with helminths are asymptomatic.
carriers, & the diseased individuals among the infected group are those with the heaviest worm burdens.
- The terms, light moderate, and heavy as applied to worm burdens are relative and differ for the various species of helminths & in people of different ages & physical status.
8. When worms are crowded the collective egg output is great, but the output per worm is relatively low, depending on the degree of crowding.
9. The factors that determine helminth population, are those associated with the host-parasite relationship (i.e. the immune factors derived from the host responses & the complex role of co-existing infection).
- Massive infection depends initially on massive inoculation of infective larvae & eggs.
10. The co-existence of several species of helminths in the same individual (poly-helminthism) is widely prevalent.
11. In some helminths, the life cycle is direct & relatively simple; involving only one host species and a brief period of development of an infective stage, an example is the pin worm (Enterobius vermicularis).
- In a group referred to as soil transmitted helminths, the life cycle involves only one host (man) but the infective stage (larvae) remaining in the egg, as in Ascaris lumbricords & Trichuris trichiura; or free in soil as in
hookworm species which requires a period of development in soil, i.e. the soil functions as an intermediate host.

- In other, the man-to-man cycle involves essential development in one intermediate host as in the filarial worms & most tapeworms, or two intermediate hosts, as in most trematodes; the first being a snail or other mollusk, the 2\textsuperscript{nd} is an animal or plant that is eaten by people.

- Intermediate hosts provide the parasite with sustenance for essential development, protection & availability to its final host.

12. Worms & larvae that migrate through or reside in tissue generally produce eosinophilia, focally in tissue, in the blood or in both.

- Persistant hyper-eosinophilia is the most recognized general sign of helminthic infection.

- Helminthic infections frequently are occult or cryptic because certain helminths of animal develop in man, but do not produce eggs or larvae & therefore the infection are not patent. Such infections are referred to as non-patent.

- In addition to eosinophilia, common signals to occult helminthic infections, somewhat in order of their significance or frequency, are hepatomegaly,
pneumonitis, bronchial asthma, urticaria, subcutaneous cyst or swelling, neurologic disturbance, and deviations in behavior.

Adult worm of cestode (tapeworm)
Adult worm of trematode (fluke)

Adult worm of nematode (roundworm)