Introduction host parasite relationship

Symbiosis: (symbiotic relationship): it is the relationship between any two living things in which each of them depend on the other (physiologically)

Symbiot: Is the organism that lives inside the body of host.

Host: is the organism that harbours the parasite.

Relationship	symbiot	Host
Mutualism	benefit	Benefit
Commensalism	benefit	No
Parasitism	benefit	Harm

1. **Mutalism**: is the relationship between the symbiot and the host in which both of them depend on each other from the physiological point of view. For example: termite- protozoa relationship, here termite feed on cellulose but its own digestive enzyme are incapable of digest it. Protozoa living in termite digestive tract have the ability to do so.

Thus termite gets benefit by digesting its food and protozoa in the same time get; nutrient, multiplication, protection, suitable environment for living and shelter.

2. **Commensalism**: in which symbiot get benefit and host remain unaffected for ex: *Entamoeba coli*.
3. **Parasitism:** here symbiot again get benefit but host is affected. For ex: *Taenia saginata* this worm feed by absorption of semi digested food (liquid material) through the whole body of it, as

each piece contain male and female genital organ and behave as a separated parasite. It prefers vitamins, proteins, and carbohydrates so cause harm to the host.

Another example of parasitism is the hydatid cysts which may be present in the kidneys, ovaries, lungs or even in the brain.

In parasitism, always the small organism is the parasite and the big one is the host. Parasite causes disease by sharing the host in his food or by causing injuries in the host different organs.

Types of parasites:

1. **Endoparasite:** this parasite lives inside the body of the host. Eg: *Malaria, Ascaris, Hydatid cysts, Taenia saginata*.
2. **Ectoparasite:** this parasite lives outside the body of the host (on the surface) as on the skin. e.g: mosquito, fleas and flies. Such as house fly, another example scabies which are microscopically parasite, that penetrate and live deep to the skin and spread beneath it just like termite on wood.
3. **Obligatory parasite:** the parasite which cannot live without host. e.g: *Malaria, Ascaris, Taenia saginata*.
4. **Facultative parasite:** a parasite that accidentally infects the host. e.g: larval stage of house flies inside the ear, this occur due to discharge of inflammation pus which attracts flies to feed on and the latter may accidentally put eggs that remain in the ear.
5. **Permanent parasite:** the parasite that remains inside the host permanently. eg: *Taenia saginata* which may live in the body for a long time (10 years).

6. **Temporary parasite:** the parasite comes to the host for short time for obtaining nutrient and then leaves away. eg: mosquito flies.

Types of hosts:

1. **Final host:** in which parasite lives and reaches maturity (sometimes called definitive host). e.g: human for *Taenia, Ascaris*.
2. **Intermediate host:** the host in which larval stages continue their life cycle and then travel to the final host so some parasite need intermediate host while others do not. e.g: cow for *Taenia saginata*, snails for *Bilharizia*.
3. **Reservoir host:** the host in which the parasite can be found or develop as asymptomatic infection until it travels to its own intermediate or final host. Ex: *leishmaina* lives in rodents as a reservoir host transmitted by sand fly as an intermediate host to human as a final host.
4. **Transport host:** an organism that transport the parasite by a mechanical process without development of the parasite inside it. e.g: house fly.

The severity of infection depends on:

A. **Host factor:**

1. Age: usually children and old people are more susceptible to sever infection.
2. Sex: there is a difference between male and female.
3. Immunity: person with intact immunity are less susceptible to infection.

4. Co-infection: having other infection causes more severe infection.

B. <u>Parasite factor:</u>

1. Number.
2. Strain
3. Route of infection: for example swallowed parasite goes to digestive tract. While parasite enter through skin will go to blood and other vital organs.

C. Factors common to both: environmental factors. In this case parasite will be affected by pH, oxygen, temperature….

Types of parasite effects:

1. **Mechanically:** usually takes place due to size, motility and pressure effect of parasite. Eg: motile worm in intestine cause irritation in the wall of the intestine.
2. **Lytic:** parasite secret lytic enzymes, eg: *Entamoeba histolytica* secrete lytic enzymes causing lyses to the cell and can invade the tissue of large intestine.
3. **Toxic:** secrete toxic substances (mainly through metabolic process of parasite) and that affect the tissue.
4. **Allergic:** the lesion produced by the parasite may open a way for another pathogen like bacteria or virus and other secondary pathogen to enter the tissue.

How are parasitic infections diagnosed?

Parasitic infections can be diagnosed in a number of ways. For example, your doctor might perform or order:

1. A blood test
2. A fecal exam: check the parasites and their eggs.
3. An endoscopy or colonoscopy.
4. X-rays, magnetic resonance imaging (MRI), or computerized axial tomography (CAT).