Parasitology introduction part 2

http://www.microbiologybook.org/book/parasit-sta.htm

CDC

WHO

basic principles and concepts

Parasite ecology and evolution :

The host is the parasite’s environment

Parasite Ecology

The Host as an Environment

Trophic Relationships

- Parasites always live at a **higher trophic level** than their hosts
- All parasites are at least primary **consumers**
- Trophic relationships are **direct** and obvious for parasites that eat host tissue and fluids (hookworms, flukes, ticks…)
- **Indirect**: “preying” on homeostatic mechanisms and reproductive efforts of organisms of lower trophic levels.

Parasite Ecology (continued)

- All parasites are **heterotrophic** : requiring energy and carbon in the form of complex organic molecules and their nitrogen as a mixture of amino acids.

Parasite Ecology (continued)

- Parasite's **feeding devices:**

- Sometimes there is no digestive tract
- Anticoagulants in ticks' saliva – adaptation to the clotting mechanism of the host's blood
- Construction of mouthparts

The Parasite's Ecological Niche

- Dependence on resources provided by the living body of host and abiotic conditions
- Infection sites

- **Coelozoic** parasites live in hollow organs
- **Histozoic** – live in tissues

Parasite Populations

Quantitative description

- **Infrapopulation** – all parasites of a particular species occurring within the body of a single host individual

- **Intensity** (mean intensity) – average number of parasites in infected host

- **Metapopulation** – all the infrapopulations within a single host species in the ecosystem

Parasite Populations (continued)

- **Suprapopulation** – all the parasites of the single species, regardless of developmental stages, that occur in the ecosystem
- **Prevalence** - % of hosts that are infected at a given time
- **Incidence** – number of new infections per unit of time divided by the number of infected individuals at the beginning of the of the measured time
- **Density** –average number of parasites per sampling unit, usually per host = arithmetic mean = abundance

- Macroparasites – large parasites that do not multiply (spend part of the life cycle in particular host species)
- Microparasites – multiply within the host

- Population structure
- Multiple species infection

Parasite Reproduction

- **Little parental care** (sometimes viviparity)
- **Increase of reproductive potential** who succeed at finding a host (asexual reproduction and hermaphroditism)
- **Schizogony or multiple fission** – nucleus divides numerous times before cytokinesis occurs, resulting in the simultaneous production of many daughter cells
- **Binary fission**