

Entomology 101 - Insects and People

Medical Importance of Arthropods

Read: Rats, Lice, and History by H. Zinsser (1935. Little Brown Publ., Boston)

For those of us that live in the so-called developed countries, it is difficult to understand the affect that insect vectored diseases still have on world populations and have had on cultural development.

In what ways do arthropods affect human health and well being?

1. By feeding on body tissues including blood.
2. By creating open wounds that can serve as sights for secondary infections
3. By producing annoyance, discomfort, and irritation
4. By the production of toxic by-products (Envenomization)
5. By transmitting agents of disease

-disease

-arbodisease

-vector

-pathogen

-reservoir

a. Mechanical Transmission

b. Biological Transmission

Some Important Arbodiseases

1. Chagas' Disease (American trypanosomiasis)
 - pathogen - flagellate protozoan
 - victim - humans and 100 or so other mammalian hosts
 - vector - conenose bugs (kissing bugs) Hemiptera: Reduviidae
 - reservoir - humans, numerous mammals
 - distribution - American tropics and subtropics
 - importance - widespread in the American tropics; currently some 10 million cases in Central and South America

Xenodiagnosis

3. Onchocerciasis (river blindness)

- pathogen - filarial worms
- victim - humans
- vectors - black flies (Diptera: Simuliidae)
- reservoir - humans
- distribution - tropical Africa and America
- importance - estimated 20 million world cases; estimated 5 million blind

4. Human Malaria

- pathogen - protozoan
- victim - humans
- vectors - mosquitoes in the genus *Anopheles*
- reservoir - humans
- distribution - mainly humid tropical areas; formerly widespread in temperate Europe and America
- importance - considered the principal debilitating parasitic disease in the tropics. A major deterrent to development in tropical countries

4. Mosquito Borne Human Filariases

- in the extreme form referred to as obstructive filariasis or elephantiasis.
- pathogen - nematode worm
- victim - humans
- vector - mosquito
- reservoir - humans
- distribution - humid tropics and around the Mediterranean
- importance - at least 250 million cases worldwide; debilitation

5. Plague (Black Death)

- pathogen - bacterium, *Yersinia pestis*
- victim - humans, fleas, and rodents (primarily a disease of rodents)
- vectors - fleas
- reservoir - partially resistant field rodents
- distribution - worldwide
- importance - historically, pandemics killed millions of people; currently between 1,500 and 5,000 cases annually.

Buboes

Affects of plague on Human Civilization

- Rural Feudal system
- power to the common person (to some slight degree)
- a new look at medicine and science
- religious reformation