

# General Arthropodology

# MEDICAL IMPORTANCE OF ARTHROPODS

## ■ Direct Impacts

- Peeler and Exploiter Impacts
- Toxic Impacts
- Traumatic Impacts
- Mechanical Impacts
- Inflammatory Impacts
- Psychological Impacts
- Immuno-biological Impacts

## ■ Indirect Impacts

### ■ Transmit of Vector-Borne Diseases

#### A) Mechanical Vector

- Transmit by biting
- Transmit by contact

#### B) Biological Vector

- Transmit by biting (blood feeding)
- Transmit by swallowed vector

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# Peeler and Exploiter Impacts

- Parasitic arthropods supply foods from their hosts. These nutrient sources can be blood, tissue liquids, various tissue cells and excret and secret of body.
- Parasitic arthropods can cause various healthy problems during the feeding processes.
  - Part of the arthropods feed by blood sucking (e.g. mosquitoes) or tissue liquid (e.g. Varroa) sucking of their hosts by using penetrative-sucking mouth parts. Some of the arthropods have cutter-chewing mouth part and feed the residuum of hair, skin and woolly of host and their epithelium cells (etc. lice located in Mallophaga genus).
- When the numbers of these are small, they usually do not cause much trouble. However, they can cause irritation, itch, discomfort, anaemia, cachexia, productivity loss and even death, when the numbers of these are too many.

# Toxic Impacts

- Some arthropods can cause toxication by transferring of venom via sitting (e.g. bee, spider, scorpion, ant and some larvae)
- or by transferring of toxic salivary fluid during blood feeding (e.g. soft ticks).
- The larvae of some arthropods which have toxin can cause toxication by way of take or eat with foods
- **Toxications**
  - **Histotoxic**
  - **Hematotoxic**
  - **Neurotoxic**

# Traumatic and Mechanical Impacts

- Parasites can cause wound, rupture and perforation in tissues of hosts and it can be seen disorders related to these systems and even deaths.
  - For example;
    - Fleas
    - Bedbugs
    - Mosquitos
    - *Hypoderma*
    - *Gastrophilus*

# Traumatic and Mechanical Impacts

- Some arthropods and their larvae can cause detrimental impact on tissue and organ of hosts by creating pressure.
- For example;
  - *Oestrus ovis*
  - *Gastrophilus*

# Inflammatory Impacts

- Parasitic arthropods and their larvae cause generally impact of foreign body in tissue and organ of host and thus cause inflammation
  - For example;
    - Scabies (mange)



# Psychological Impacts

- Restlessness caused by arthropods (feeding from hosts) can create problems and thus can give rise to problems on the situation of general health of hosts and productivity loss
  - Restless animals- difficulty in intervention
  - *Tabanid*, and *Hypoderma* spp.
  - Some psychological disturbances in humans (delusion)

# Immuno-biological Impacts

- Arthropods can cause allergic reactions in humans and animals.
  - Individual sensitivity level
  - Immunogenic feature
  - Encounter before

# Immuno-biological Impacts

- Immunological reactions are mostly caused by salivary fluids of blood feeding arthropods (e.g. tick, flea, lice, mosquito, etc.).
- Some arthropods cause allergic reactions with their feces (e.g. house dust mite) or contact of arthropod's body (e.g. tarantula).
  - Three type arthropod-borne allergies (IgE-mediated) are seen in humans and animals.

# Immuno-biological Impacts

- Type I allergic anaphylaxis
- The reactions evolve very quickly (minutes or a few hours). It can be local or generalize
  - Bite of mosquito, flea, or bedbug
  - Inhalation of feces of house dust mites (rhinitis, asthma, etc.).
  - Bee stings (anaphylactic shock).

# Immuno-biological Impacts

- Type II allergy
- Destructive effect of antigen-antibody complex.
  - Swelling, erythema, hemorrhages in the skin due to the bite of mosquitoes, fleas, and bedbugs (usually after 6-8 hours)
  - Joint pain or nephritis caused by mosquito bites.