



COCKROACHES
(Blattaria)

Taxonomy

- There are about 4000 species of cockroaches worldwide.
- There are five cockroach families, three of which include most of the pest species:
 - Blattidae
 - Blattelidae
 - Blaberidae

Morphology

- The Blattaria are distinguished from other insect orders by morphological characters associated with
 - wing size and venation
 - Biting-chewing mouthparts
 - Prominent cerci
- An indicator of cockroach infestations in their egg cases, or **oothecae**, which can be useful in differentiating species infesting buildings.

Life History

- The immatures generally are similar in appearance to the adults except for their undeveloped sexual organs and lack of fully developed wings.

- *Blatta orientalis* (Oriental cockroach)
- *Blatta lateralis* (Turkestan cockroach)
- *Periplaneta americana* (*Periplaneta americana*)
- *Periplaneta brunnea* (Brown cockroach)
- *Blattella germanica* (German cockroach)

Public Health Importance

- Mechanical transmission
 - Bacteria (e.g. *Salmonella* spp., *E. coli* etc.)
 - Protozoa (*T. gondii*)
- Intermediate hosts
 - *Ancylostoma duodenale*
 - *Necator americanus*
 - *Ascaris lumbricoides*
 - *Enterobius vermicularis*
 - *Hymenolepis* spp.
 - *Trichuris trichuria*

Prevention and Control

- Sanitation
- Harborage Elimination
- Physical Control
- Biological Control



COLEOPTERA (Beetles)

- Beetles constitute the largest order of insects but are relatively minor public health or veterinary importance.
- Adults and larvae of a few species occasionally bite, but more species secrete chemicals that can irritate the skin and eyes of humans and other animals.
- Beetles found in stored products can cause inhalational allergies, and some species found in dung and stored products act as intermediate hosts for helminthes that cause pathology in domestic and wild animals.

Culicidae (Mosquitoes)

Taxonomy

- Mosquitoes occur in practically every region of every continent in the world except Antarctica.
- Culicidae consist of about 3200 recognized species.
- There are 43 genera of mosquitoes, 40 of which are in the subfamily Culicinae.
- Genera
 - *Anopheles*
 - *Aedes*
 - *Culex*
 - *Culex pipiens* complex
 - *Culiseta*
 - *Mansonia*

Life History

- The holometabolous life cycle of mosquitoes is completed in two different environments, one aquatic, the other terrestrial.
- The larvae and pupae develop in a wide range of aquatic habitats.
- Mosquito eggs are laid either on or in water or on solid substrates that are likely to become inundated.

Public Health Importance

- Mosquito Bites
- Mosquito-Borne Viruses
 - Chikungunya
 - Dengue
 - Yellow fever
 - West Nile
 - Rift Valley fever
 - Equine encephalomyelitis
- Malaria (*Plasmodium*)
- Filariasis

Veterinary Importance

- Mosquito-borne viruses
 - Equine Encephalomyelitis
 - Japanese Encephalitis
 - Rift Valley fever
- Nonhuman Malarias
 - Reptilian Malarias
 - Avian Malarias
 - Primate malarias
- Dog Heartworm (*Dirofilaria* spp.)

Prevention and Control

- The four overlapping aims of mosquito control are
 - to prevent mosquito bites,
 - keep mosquito populations at acceptable densities
 - minimize mosquito-vertebrate contact
 - reduce the longevity of female mosquitoes.