Phlebotominae (Sand Flies)

Taxonomy

- The subfamily Phlebotominae includes about 700 species classified into five genera.
- The New World genus *Lutzomyia* and Old World genus *Phlebotomus* include species of public health and veterinary importance.

Life History

- Sand flies breed in humid, terrestrial habitats.
- Breeding sites include cracks and crevices of soil, manure, rocks, masonry, rubble, forest litter, tree hallows, tree crotches, termite mounds, animal burrows, nests, poultry houses, barns, stables, homes, privies, cesspools, cellars, wells, and other dark, moist locations where organic material is present.
- Both male and female sand flies feed on plant juices and sugary secretions.
- Females also blood feed to produce egg.
- Larvae feed on decaying organic matter, fungi, and associated microorganisms.

Public health importance

- Many species of *Lutzomyia* and *Phlebotomus* are vector of viral, bacterial, and parasitic pathogens of humans.
  - Vesicular Stomatitis Virus Disease
  - Chandipura Virus Disease
  - Sand Fly Fever
  - Changuinola Virus Disease
  - Bartonellosis
  - Leishmaniasis

Veterinary Importance

- Leishmaniasis
- Vesicular Stomatitis Virus Disease

Prevention and Control

- Insect repellents and protective clothing are effective personal protection.
- Sand flies cannot bite through outdoor clothing because of their relatively short mouthparts.

Simuliidae (Black Flies)

Taxonomy

- More than 2000 species of black flies have been described worldwide.
- The Simuliidae comprise two subfamilies.
  - Parasimuliinae (the females of these species do not have biting mouthparts)
  - **Simuliinae**

Life History

- Immature black flies are found in virtually any water that flows, even if only imperceptibly and temporarily, from the smallest trickles to the largest rivers.

- Most species occupy specific habitats.

Public Health Importance

- Biting and Nuisance Problems.
- Human Onchocerciasis
- Mansonellosis

Veterinary Importance

- Biting and Nuisance Problems.
  - Simulitoxicosis
- Bovine Onchocerciasis
- Leucocytozoonosis

Prevention and Control

- Management of black flies typically is aimed at the larval stage.
- Although adulticiding has sometimes offered temporary relief, it is typically more costly and has been used less frequently than larviciding.
- The use of the entomopathogenic bacterium *Bacilus thuringiensis* var. *israelensis*

Glossinidae (Tsetse Flies)

Taxonomy

- Glossinidae includes the single genus *Glossina* with 31 species and subspecies.
- Glossina species are arranged in three subgenera
  - *Austenina*
  - *Nemorhina*
  - *Glossina*

Morphology

- *Glossina* species are tan or brown flies, which range in length from 6 to 14 mm, excluding the proboscis.

Public Health Importance

- African Sleeping Sickness
  - *Trypanosoma gambiense*
  - *Trypanosoma rhodesiense*

Veterinary Importance

- Nagana
  - *Trypanosoma brucei*
  - *T. congolense*
  - *T. simiae*
  - *T. vivax*
  - *T. uniforme*
  - *T. suis*

Prevention and Control

- intensive treatment and isolation of infected human and domestic animal hosts to try to break transmission cycles
- use of trypanotolerant animals for agricultural purposes
- laboratory research on development of vaccines for human and non-human hosts
- as well as chemical and ecological attacks on the tsetse flies themselves.