



Fleas (Siphonaptera)

Taxonomy

- There are approximately 2500 species and subspecies of fleas that currently are placed in 15 families and 220 genera.
- Most fleas of medical or veterinary importance are members of family Pulicidae, with other important fleas belonging to the Ceratophyllidae, Leptopsyllidae, or Vermipsyllidae.

Morphology

- Adult fleas are small (1-8 mm), wingless, almost invariably bilaterally compressed, and heavily chitinized.

Life History

- Fleas are holometabolus insects, with an egg, larval (typically consisting of three instars), and pupal stage.
- Most flea larvae feed on organic matter in the nest or bedding materials of their hosts.

Human Flea (*Pulex irritans*)

- This flea will feed on humans and is capable of transmitting pathogens of medical importance.
- However it is more commonly an ectoparasite of swine and domestic dogs in most parts of the world.
- Adults of this species lack both genital and pronotal sternalia.

Cat Flea (*Ctenocephalides felis*)

- The cat flea occurs worldwide and is currently the most important flea pest of humans and many domestic animals.
- It is primarily a nuisance because it feeds not only domestic and feral cats, but also on humans, domestic dogs, and several livestock species.
- Cases of severe anemia associated with huge numbers of cat flea bites have been recorded for these and other domestic animals.

Dog Flea (*Ctenocephalides canis*)

- This flea is much less common on domestic dogs in most parts of the world than in previous decades.
- Instead, the cat flea has become the most common flea on domestic dogs in most regions.
- Dog fleas also parasitize wild canids such as foxes, coyotes, and wolves, on which they can be relatively common.

- Oriental Rat Flea (*Xenopsylla chopis*)
- European Rabbit Flea (*Spilopsyllus cuniculi*)
- Sticktight Flea (*Echidnophaga gallinacea*)
- Chigoe (*Tunga penetrans*)
- Northern Rat Flea (*Nosopsyllus fasciatus*)
- European Chicken Flea (*Ceratophyllus gallinae*)
- European Mouse Flea (*Leptopsylla segnis*)

Public Health Importance

- Flea-Associated Allergies
- Plague (*Yersinia pestis*)-*Xenopsylla cheopis*
- Murine Typhus (*Rickettsia typhi*)-*Xenopsylla* spp.
- Tungiasis- *Tunga penetrans*
- Double-pored tapeworm (*Dipylidium caninum*)-*C. felis*, *C. canis*, and *P. irritans*

Veterinary Importance

- Flea-Bite Dermatitis
- Allergic reactions to flea bites are a common problem of domestic animals, especially household pets.
- Hypersensitivity to saliva from feeding fleas is usually more apparent in pets
- A single flea bite can trigger an acute, sometimes chronic, dermatitis in hypersensitive dogs or cats.

- Tungiasis-*Tunga penetrans*
- Myxomatosis-*Spilopsyllus cuniculi*
- Murine Trypanosomiasis (*T. lewisi*)-*Nosopsyllus fasciatus*
- Double-pored tapeworm (*Dipylidium caninum*)-*C. felis*, *C. canis*, and *P. irritans*
- *Hymenolepis nana* and *H. diminuta*

Prevention and Control

- Various methodologies are used to control fleas or to protect humans and other animals from flea bites.
- Frequently vacuuming in homes, especially in areas where pets rest or sleep, helps to remove immature fleas and their food: steam cleaning of carpets is even more effective.
- Insect growth regulator (IGR) applications to carpets following steam cleaning will prevent subsequent reinfestations.

- Treatment of flea-infested premises or domestic animals with various insecticides generally provides good flea control.
- Host-targeted topical applied ectoparasiticides include pyrethrins, pyrethroids (e.g., permethrin), neonicotinoids (e.g., imidacloprid, dinofuran), phenylpyrazoles (e.g., fipronil), macrocyclic lactones (e.g., selamectin) and semicarbazones (e.g., metaflumizone)