

# Fleas

## Description

**Order:** Siphonaptera

### Characteristics:

Adults 1-8mm long; brownish in colour, body laterally compressed (streamlined) and covered with backward-directed bristles; reduction or loss of eyes; piercing mouth parts; no wings, although transitory wing buds may appear in pupae of some species; muscular legs, with hind limbs adapted for jumping; metamorphosis complete with egg, larval, pupal and adult stages.

### Species characteristics and host/habitat:

#### Cat Flea (*Ctenocephalides felis*)

Adults, 2-3.25mm long; forepart of head longer than it is high; prominent pronotal and genal combs (first teeth of genal comb nearly as long as second); basal section of legs equipped with stout spines.

**Host/habitat:** especially members of Felidae family, also dogs, other animals and man; found particularly in host bedding. Many infestations in commercial and institutional premises derive from feral cats.

#### Dog Flea (*Ctenocephalides canis*)

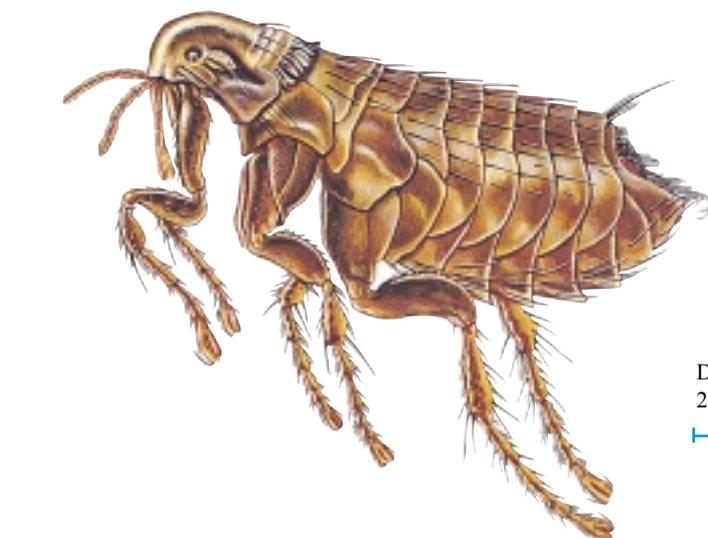
Adults, 2-3.25mm long; forepart of head as long as it is high; prominent pronotal and genal combs (first teeth of genal comb only about half as long as second); basal section of legs equipped with stout spines.

**Host/habitat:** especially members of Canidae family, also domestic animals and man; found particularly in host bedding.

#### Human Flea (*Pulex irritans*)

Adults, 2-3.5mm long; no pronotal or genal comb; basal section of legs equipped with stout spines.

**Host/habitat:** especially man, but will also breed on pigs, hedgehogs, foxes and badgers; found in homes, usually in bedrooms.



Dog Flea  
2.6mm long



#### Rabbit Flea (*Spilopsyllus cuniculi*)

Adults, 1.5-2.25mm long; pronotal and genal combs, the latter with five vertically arranged rounded spines; basal section of legs equipped with stout spines.

**Host/habitat:** especially rabbits, in whom it is the main vector of the myxomatosis virus, but will also attack cats; the females are sedentary and attach themselves to the host, especially around the ears and head.

#### Tropical Rat Flea (*Xenopsylla cheopis*)

Adults, 1.5-2.5mm long; no pronotal or genal comb; row of bristles along back of head; basal section of legs equipped with stout spines.

**Host/habitat:** various rodents, but will also attack man; found especially around ports.

#### Hedgehog Flea (*Archaeopsyllus erinacei*)

Adults, 2-3.5mm long; genal comb of 1-3 short spines; pronotal comb of 2-9 spines.

**Host/habitat:** generally associated with hedgehogs, but occasionally brought indoors by dogs, cats and humans; also found in gardens and outbuildings.

#### Bird Flea (*Ceratophyllus gallinae*)

Adults 2-2.5mm long; no head folds to retain antennae; pronotal comb with more than 24 teeth; no genal comb, no spines on basal section of legs.

**Host/habitat:** especially birds nesting in dry situations but will also attack animals and man; breeding mostly limited to birds' breeding season, migrating from the nests when fledglings leave. Often originating from birds' nests in roof spaces.

#### Mole Flea (*Hystrihopsylla talpae*)

Adults 3.5-6mm long; genal comb of 9-12 spines; pronotal comb of 42-58 spines.

**Host/habitat:** associated with moles; also found in gardens and outbuildings.

## Distribution

Adult fleas live exclusively as parasites of warm-blooded animals, especially mammals, although birds may also be attacked. Whilst they show a certain degree of host preference, fleas are by no means specific and will feed on other animals in the absence of the normal host. In fact they tend to be more nest than host-specific, for whilst the adults may feed on the blood of a variety of animals the larvae require more precise conditions which are associated with the habitats and nesting habits of the hosts rather than the characteristics of their blood.

Cat fleas are responsible for many flea infestations, the remainder being attributable to a variety of bird and animal species. *Pulex irritans* infestations are now uncommon. The significance of *Ctenocephalides felis* is explained by the increased number of pets being kept and the tendency for their beds to be neglected during cleaning. Wall-to-wall carpeting also provides a relatively undisturbed environment for flea larvae to develop, whilst the spread of central heating has served to ensure ideal temperature conditions.

## Significance

Fleas can be vectors of disease or may transmit parasitic worms. The most serious infection which they can spread is bubonic plague, transmitted to man by rodent fleas (*Xenopsylla cheopis*) which carry the causative bacillus from infected rats. In the past rodent fleas have been responsible for serious epidemics of the disease, notably the Black Death in Europe and Asia in the 14th to 17th centuries. Rodent fleas may also carry murine typhus and, because of their readiness to attack humans as well as rats, are probably the major flea vector of disease. The Dog flea is an intermediate host of the Dog tapeworm (*Dipylidium caninum*), whose vertebrate host is usually the dog (occasionally the cat) but which can sometimes be transmitted to man.

In Europe fleas are not generally responsible for the transmission of disease. However, they are still objectionable because of the bites they inflict and the deep-rooted social stigma attached to humans with flea infestations. Occasionally psychological problems arise with the induction of delusory parasitosis, in which the victim imagines he is infested with ectoparasites.

Flea bites are identified as a tiny dark red spot surrounded by a reddened area. The bite persists for one or two days and is intensely irritating. First bites are not generally liable to cause serious reactions, but they may lead to hypersensitivity. Reactions are usually delayed following regular biting over a long period; there will then follow a period when reactions are immediate. The cycle then repeats until a state of non-reactivity - immunity - is achieved.

## Life-Cycle

Flea eggs are about 0.5mm long, oval, pearly-white in colour and laid indiscriminately in the fur or feathers of the host or in its nest or bedding. They do not adhere to the host but readily fall from the animal, are shaken or scratched off. The same applies to the dark coloured faeces of the adult fleas thus creating the black and white - salt and pepper - effect associated with flea infestations. Four to eight eggs are laid after each blood meal and a single female may produce 800-1000 eggs during her lifetime, which may be as long as two years.

The eggs hatch in about one week to give white, threadlike, legless larvae 1.5mm long.

These are distinguished by an identifiable, usually brownish head without eyes; jaws adapted for biting; three thoracic segments and 10 abdominal segments all equipped with bristles; and peg-like processes on the terminal abdominal segment. The larvae thrive in dark, humid places such as animal bedding and carpet fluff, and feed on organic debris and adult flea excrement. The latter forms a valuable part of the diet as a source of blood, which some larvae, while not attacking the host, require for their development. Larvae may also be predacious, living on small and weak arthropods. Cats' bedding may support a flea population of 8000 immature and 2000 adult forms. A typical flea infestation may be composed of adults 5%, larvae 35%, pupae 10% and eggs 50%.

After 2-3 weeks, by which time they will have moulted twice and be about 5mm long, the larvae spin silken cocoons, incorporating debris, in which to pupate. The cocooned larvae then moult within three days to give the pupae which are initially creamy-white but change to dark brown as they mature to become adults. This phase is the quiescent stage and the flea may overwinter in this state. The adult flea will then be stimulated to emerge by the vibrations set up by a passing host. This explains the occasional mass attacks which take place in deserted premises.

The development cycle from egg to adult is normally completed in 4 weeks but at low temperatures will take much longer.

## Control

Selecting flea control measures depends to a large extent on the size of the problem. In many instances infestations of well kept houses can be easily traced to pets. Where this is not the case it is useful to establish the pest species. This will help to identify possible hosts and even the foci of the infestations. Control measures must be directed at the brood as well as the adult fleas.

### a) Hygiene/management

Regular cleaning will deny the insects their breeding site and so make an important contribution towards their control. Infested clothing, beds and bedding should be destroyed by burning or thoroughly cleaned and the same measures employed when dealing with old bird and animal nests. Accumulations of debris should also be removed from cracks and crevices such as the cracks between floorboards, and the whole area thoroughly cleaned.

### b) Insecticidal control

Insecticides can be used to treat infested premises and protect them from reinfestation. In addition, hosts can be treated directly, or rodenticides employed.

#### Host treatments:

Insecticidal products are available which have been specifically formulated and registered for use on the host animals. Only these products should be applied to animals and care should be taken to follow the manufacturer's instructions.

#### Rodenticides:

Where rats and mice have been identified as the primary hosts in flea infestations, rodenticides can be used to control them and, indirectly, the fleas.

## Checklist for control

|                        |   |
|------------------------|---|
| <b>SURVEY</b>          | <ul style="list-style-type: none"> <li>— Define the extent of the infestation.</li> <li>— Identify involvement of animals.</li> </ul>                                   |
| <b>PRE-TREATMENT</b>   | <ul style="list-style-type: none"> <li>— Clean thoroughly.</li> <li>— Remove articles from the area to be treated.</li> <li>— Treat animals, as appropriate.</li> </ul> |
| <b>TREATMENT</b>       | <ul style="list-style-type: none"> <li>— Interior.</li> <li>— Exterior.</li> <li>— Control rodents etc, as appropriate.</li> </ul>                                      |
| <b>ADVISE OCCUPIER</b> | <ul style="list-style-type: none"> <li>— Expectations for control.</li> <li>— Further actions by pest control operator and occupier.</li> </ul>                         |

## Glossary of terms

*Genal and pronotal combs*: Rows of stout spines on cheek and first thoracic segment respectively.