

# Louse infestation (pediculosis) in pet animals

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**ABSTRACT:** Although pediculosis in pet animals is less common than flea infestation in most parts of the United Kingdom, it should be considered in the differential diagnosis of pruritus, erythema, scaling, anaemia and irritability. It is a cause of miliary dermatitis in cats. Lice are easily killed by many commercially available insecticides. Transmission is usually by direct contact but indirect transmission is also possible and brushes, combs, bedding and the general environment should be kept clean. DOI: 10.1111/j.2044-3862.2010.00027.x

## INTRODUCTION

Lice are small (1-2 mm), dorsoventrally flattened, wingless insects. They are host-specific, obligate parasites and spend their entire life cycle (about three weeks) on the host. Lice are reported to be increasing in number in Western Europe, and in northern Scotland, they are more common than fleas.

## LICE IN DOGS

Two species of lice are found in dogs in the UK, *Trichodectes canis* (family Mallophaga), the biting or chewing louse (Fig. 1), and *Linognathus setosus* (family Anoplura), the sucking louse. In Australia and some tropical countries, another biting louse, *Heterodoxus spiniger* (family Boopidae), can be found. Transmission is usually by direct contact between dogs although immature lice can survive for up to three or four days off-host, long enough to be transmitted indirectly via brushes, combs and bedding. Neglected animals in overcrowded, dirty conditions are particularly susceptible.



Fig. 1: *Trichodectes canis*, the canine biting louse.

*Trichodectes* feeds on hair, skin debris, scale and inflammatory exudate. It can act as intermediate host for the tape worm, *Dipylidium caninum*. *Linognathus* feeds on blood, lymph and inflammatory exudate. Lice are typically found at the base of hairs, and adult lice have a claw at the end of each foot enabling them to stay attached.

Eggs (nits) are laid by females at the base of hairs and attached firmly to the hairs by cement. They are about 1 mm long, whitish and operculate (Fig. 2), and hatch out within about six days to produce



Fig. 2: *Trichodectes canis nit*.



Fig. 3: Scaling, crusting and alopecia on the pinna of a Labrador with lice.

nymphs which then moult three times before becoming adults. Each female lays about 300 eggs and can live up to eight weeks.

## Clinical features of louse infestation in dogs

Lice are most commonly found around the head and back, accumulating under mats of hair, and around the pinnae (Fig. 3). Pruritus with poor coat and alopecia are classic features although severity of pruritus is variable (Fig. 4). A pinnal-pedal scratch reflex is sometimes seen. Papules, scale, crusting, excoriations and secondary infections may be severe (Fig. 5). Dogs with lice often have a poor, dirty, matted coat although this can be associated with neglect as much as the lice themselves. Affected dogs may also smell quite bad and are often irritable. Some animals, however, are asymptomatic carriers.

Heavy infestations of sucking lice, especially in young animals, may produce anaemia.





Fig. 4: Depression, poor coat, scaling, crusting and alopecia in a Labrador with lice



Fig. 5: Erythema, alopecia and excoriations on the forelegs of the dog in Fig. 4.

### Diagnosis

The diagnosis is suggested from the history and clinical signs but confirmation requires finding the lice. Lice are visible to the naked eye but biting lice move very quickly and may be difficult to see (Fig. 6). A magnifying glass may be helpful. Skin



Fig. 6: Lice and nits adherent to the base of hairs on the head of a Labrador with *Trichodectes* infestation.



Fig. 7: Tape strips can be used to demonstrate lice in animals.

scrapings, tape strips and hair plucks can be used to demonstrate both lice and nits (Fig. 7). Skin biopsies are unnecessary, histopathology revealing varying degrees of superficial perivascular dermatitis.

The differential diagnosis includes allergic skin diseases, sarcoptic mange, cheyletiellosis and harvest mite infestation.

### Prognosis

The prognosis is usually good with appropriate treatment.

### Treatment

Mats should be clipped and the patient and all in-contact dogs treated with an appropriate insecticide. Fortunately, lice are relatively easy to eradicate although products may need to be re-applied in line with manufacturer's instructions. Many of today's commercially available insecticidal products are effective and licensed for treating biting lice in dogs (Table 1). These products are considered effective against, but unlicensed for, sucking lice. Brushes, combs and bedding should be cleaned thoroughly and the premises sprayed where appropriate with a suitable environmental insecticide (Table 2). Advice should be given to owners regarding importance of general hygiene and environmental cleanliness. The source of infestation should be investigated with a view to preventing re-contamination.

### LICE IN CATS

The species of louse found in cats is the biting louse, *Felicola subrostratus*. As well as being a cause of severe pruritus, *Felicola* may be associated with miliary dermatitis. Cats may sometimes be asymptomatic carriers of *Felicola*. Diagnosis is confirmed by demonstration of lice or nits.

**TABLE 1: Commonly used insecticidal products, licensed for use against biting lice (*Trichodectes canis*) in dogs. All products should be used in line with manufacturer's instructions.**

	Formulation	Ingredients	Application
Advantage (Bayer plc)	Spot-on	Imidacloprid	On dog
Advantix* (Bayer plc)	Spot-on	Imidacloprid and permethrin	On dog
Advocate (Bayer plc)	Spot-on	Imidacloprid, moxidectin	On dog
Effipro Spray (Pfizer Ltd)	Spray	Fipronil	On dog
Frontline Spray (Merial Animal Health)	Spray	Fipronil	On dog
Frontline Spot-on Dog (Merial Animal Health)	Spot-on	Fipronil	On dog
Frontline Combo Spot-on Dog (Merial Animal Health)	Spot-on	Fipronil, methoprene	On dog
Promeris duo (Pfizer Ltd)	Spot-on	Metaflumizone, amitraz	On dog
Stronghold (Pfizer Ltd)	Spot-on	Selamectin	On dog

\* Contraindicated in cats

Continued on page 52

**TABLE 2: Commonly used environmental insecticidal products. All products should be used in line with manufacturer's instructions.**

Acclaim (CEVA Animal Health Ltd)	Spray	S-methoprene, permethrin	General, household environment
Indorex (Virbac Ltd)	Spray	Permethrin, pyriproxyfen, piperonyl butoxide	General, household environment
RIP for fleas (Genitrix)	Spray	Methoprene, permethrin, bioallothrin	General, household environment
Staykil (Novartis)	Spray	Permethrin, cyromazine	General, household environment

**TABLE 3: Commonly used insecticidal products, licensed for use against biting lice (*Felicola subrostratus*) in cats. All products should be used in line with manufacturer's instructions.**

	Formulation	Ingredients	Application
Effipro Spray (Pfizer Ltd)	Spray	Fipronil	On cat
Frontline Spray (Merial Animal Health)	Spray	Fipronil	On cat
Frontline Spot-on Cat (Merial Animal Health)	Spot-on	Fipronil	On cat
Frontline Combo Cat (Merial Animal Health)	Spot-on	Fipronil, methoprene	On cat
Stronghold (Pfizer Ltd)	Spot-on	Selamectin	On cat

#### Treatment

Some insecticidal products are specifically licensed for use against *Felicola subrostratus* in cats (Table 3). Advantix is toxic to cats and should always be avoided in this species. Cats should not be allowed to come into contact with animals treated with Advantix until the application site is dry. The data sheet states that cats should not be allowed to groom the application site on a dog treated with Advantix.

#### LICE IN OTHER SPECIES (Table 4)

Diagnosis is confirmed by demonstration of lice or nits.

#### GUINEA PIGS

Lice are common in guinea pigs. The two most common species, *Gliricola porcelli* (slender guinea pig louse) (Fig. 8) and *Gyropus ovalis* (oval guinea pig louse) are both biting lice. Another species of biting louse, more rarely found in guinea pigs, is *Trimenopon hispidum*.

Infestation in guinea pigs is often asymptomatic although pruritus, poor coat, scaling, crusting and alopecia, especially around the ears and dorsum, may develop (Fig. 9). Young guinea pigs kept in poor conditions are more susceptible to heavy louse infestations.

#### Treatment

A recent study (Sanghun *et al.*, 2008) suggested a single topical application of 0.05 ml of a solution containing imidacloprid (10% w/v) and moxidectin (1% w/v) (Advocate spot on solution for small cats and ferrets: Bayer plc) to be an effective and convenient treatment for *G. porcelli* infestation in guinea pigs. Sprays

**TABLE 4: Lice found in rabbits, guinea pigs, mice and rats and treatments used.**

	Lice	Treatment
<b>Rabbits</b>	<i>Haemodipsus ventricosus</i> (sucking)	Pyrethroid-containing powders; permethrin (Xenex Ultra Spot-on, Genitrix Ltd); ivermectin spot-on (Xeno 50-mini, Genitrix); ivermectin spray (Xeno 200 spray, Genitrix Ltd); ivermectin injection (200-400 µg/kg sc injection on 3 occasions at 2 week intervals); selenium sulphide shampoo (Seleen, Ceva). Improved husbandry.
<b>Guinea pigs</b>	<i>Gliricola porcelli</i> (biting) <i>Gyropus ovalis</i> (biting) <i>Trimenopon hispidum</i> (biting)	Imidacloprid and moxidectin; also as per rabbits
<b>Mice and rats</b>	<i>Polyplax serrata</i> (sucking louse of mice) <i>Polyplax spinulosa</i> (sucking louse of rats)	As per guinea pigs

approved for lice in cats are likely to be safe and effective in guinea pigs, although it would always be prudent to check with the manufacturers. A range of topical and injectable ivermectin products are available for guinea pigs (Table 4).

#### RABBITS

Lice are an uncommon cause of skin disease in rabbits. Heavy infestations of *Haemodipsus ventricosus* (a sucking louse) may result in variable pruritus, scaling and anaemia.

For treatment options see Table 4.



**Fig. 8:** *Gliricola porcelli*, a biting louse of guinea pigs.



**Fig. 9:** Alopecia in a guinea pig infested with *Gliricola porcelli*, a biting louse.

## mICE aND RaTS

Sucking lice (*Polyplax serrata* in mice, *Polyplax spinulosa* in rats) are occasionally found. Clinical signs are variable and include pruritus, erythema and scaling, typically on the neck and back. Young and debilitated rodents are more susceptible.

## Treatment

One drop of imidacloprid (10% w/v) and moxidectin (1% w/v) (Advocate spot on solution for small cats and ferrets: Bayer plc) has been recommended for treatment of lice in small rodents (Beck, 2004).

## Summary

Although pediculosis in pet animals is less common than flea infestation in most parts of the United Kingdom, it should be considered in the differential diagnosis of pruritus, erythema, scaling, anaemia and irritability. It is a cause of miliary dermatitis in cats. Lice are easily killed by many commercially available insecticides. Transmission is usually by direct contact but indirect transmission is also possible and brushes, combs, bedding and the general environment should be kept clean.

## FURTHER READING

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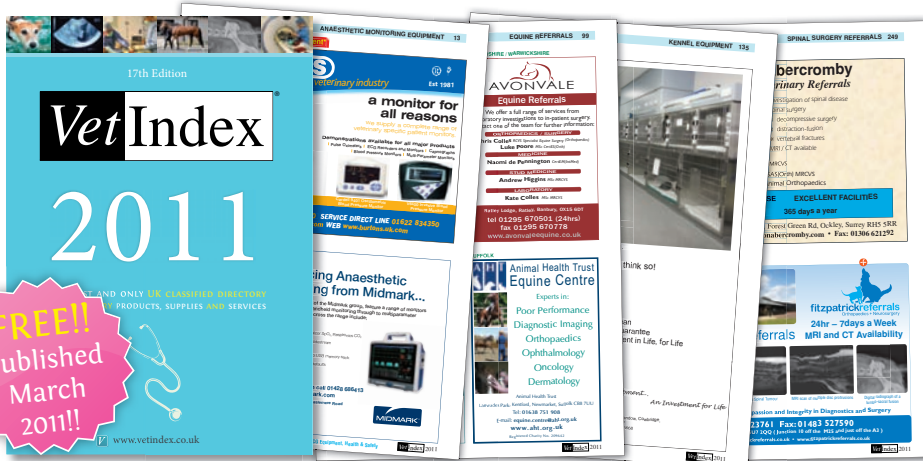
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These multiple choice questions are based on the above text. Answers appear as supporting information in the online version of this article.

1. Which of the following statements is/are accurate:
  - a. Lice are small, flattened insects
  - b. Lice spend much of their life cycle off the host
  - c. Lice are not host-specific
  - d. All of the above
2. *Linognathus setosus* is the sucking louse of dogs: True or false.
3. Which of the following are biting lice:
  - a. *Felicola subrostratus*
  - b. *Linognathus setosus*
  - c. *Polyplax serrata*
  - d. All of the above
4. Which of the following lice are found in guinea pigs:
  - a. *Glicicola porcelli*
  - b. *Polyplax serrata*
  - c. *Heterodoxus spiniger*
  - d. None of the above



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