

ECTOPARASITES: *OTODECTES CYNOTIS*, *FELICOLA SUBROSTRATUS* AND *NOTOEDRES CATI* IN THE EAR OF CATS

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Summary: In 1998-99 we examined the carcasses of 101 stray cats from the Ljubljana area for ectoparasites in the ear. The cats were transported to the pathology laboratory for examination after they had been euthanized for medical reasons, killed by hunters or on the roads or they had died as a result of various diseases. Swabs were collected from the auricle and deep inside the auditory canal of each cat using a circular motion and then immediately treated with 10 % KOH. We found that 34.65 % of the cats were infested with one or more of *Otodectes cynotis* (33 cats; 32.7 %), *Felicola subrostratus* (5 cats; 4.95 %) and *Notoedres cati* (2 cats; 1.98 %).

Key words: ectoparasites; ear; stray cats

Introduction

Stray cats may be a source of various diseases in their environment. They may transmit diseases directly to other animals and to humans via companion cats. These include some important parasitic diseases caused by ectoparasites, which are in many cases zoonotic and are not uncommon (1). Thus, the ectoparasites are a recurrent and important source for the transmission of various diseases; they provoke hypersensitivity and skin disorders in cats and, above all, they can cause serious, life-threatening anaemia in young animals.

The most common ear mite is *Otodectes cynotis*, which colonizes the external ear canal (auditory canal) and the outer ear (auricle) in dogs and cats. Sotiraki et al. (2) are of the opinion that *Otodectes cynotis* is responsible for at least half of the feline illness in the world. Mehlhorn believes that 80 % of Europe's stray cats carry this parasite (3). Cats and foxes are the most common carriers of *Otodectes cynotis* and may transmit the parasite to dogs and to humans who have close contact with an infested animal (4).

The parasitic *Notoedres cati* mite is relatively rare. It colonizes the facial area of cats and is especially frequent around the auricle. *Notoedres cati* is most frequently found on stray cats in particularly poor condition (1).

Additionally, the disease it causes is zoonotic and it most commonly affects humans in the area of the palm and the back of the hand. Young children are particularly at risk and it may cause transient dermatitis.

Felicola subrostratus belongs to the order of *Mallophaga*, chewing lice, which are rare in cats and usually only seen on the head, face, neck, back and auricle of elderly or chronically ill animals. They are more problematic in long-haired cats (3, 5) and can cause an unpleasant itch in humans.

Material and methods

The object of this study was to determine the type and degree of ectoparasitic ear infestations found in 101 stray cats from the Ljubljana area between 1998 and 1999. Swabs were collected from the auricle and from deep inside the auditory canal of both ears of the cats, whose carcasses had been brought to the pathology laboratory for examination. The swabbing was performed using a circular motion and the

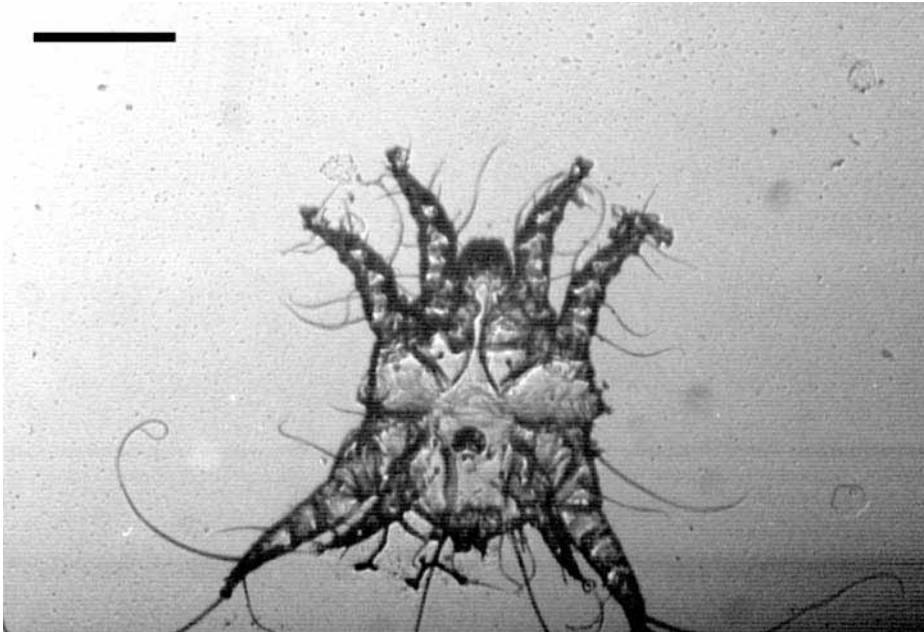


Figure 1: *Otodectes cynotis*, male, ventral view (scale = 160 μ m)



Figure 2: *Notoedres cati*, female, ventral view (scale = 120 μ m)

swabs were immediately treated with 10 % KOH. Treating the sample in this manner clears away any dark cerumen, debris and dirt and leaves a transparent sample, which allows any isolated parasites to be quickly observed and determined by their morphological characteristics. The 10 %-KOH treatment is commonly used in parasitology to observe ectoparasites, which are arthropods and whose exoskeletons are primarily composed of chitin. The KOH is used to make the chitin transparent and to dissolve keratin, hairs and debris (6).

A large number of the examined cats had dark cerumen, which indicated inflammatory distur-

tion of the auditory canal caused by *Otodectes cynotis*. *Felicola subrostratus* and *Notoedres cati* mites were also found in some of the cats with very dark cerumen, excessive content and crusts in the ear. These smears were intensely odorous. The swabs of the cats with clean ears, i.e. without dirty cerumen or crusts, were generally negative.

Results

The following ectoparasites were identified from the swabs: - *Otodectes cynotis*, *Felicola subrostratus* and *Notoedres cati*.

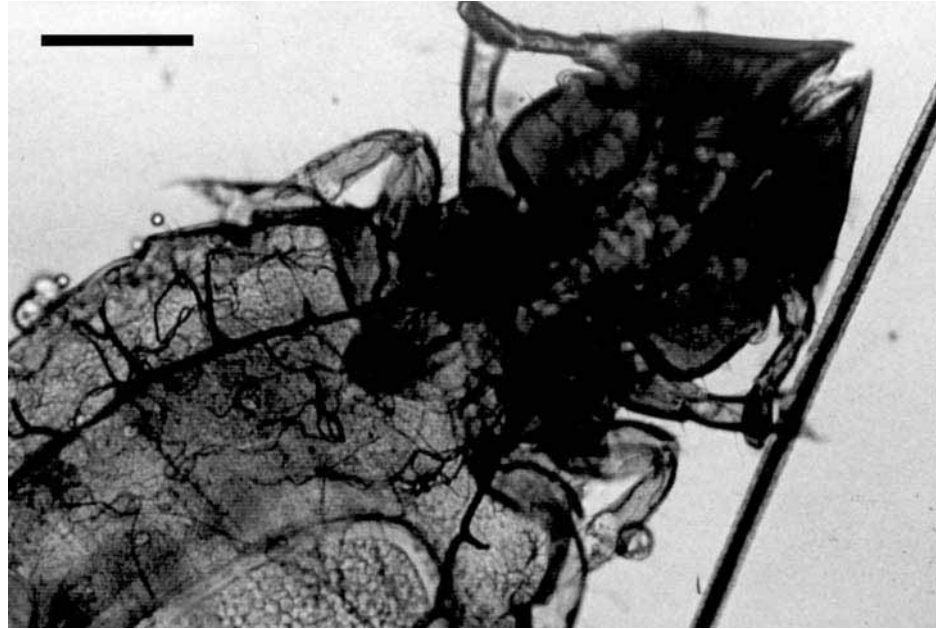


Figure 3: *Felicola subrostratus*, female, a proximal part of the body (scale = 200 μ m)

Table 1: Breakdown of the type and distribution of the ectoparasites identified in % (all cats n = 101)

Positive cats	<i>Otodectes cynotis</i>	<i>Felicola subrostratus</i>	<i>Notoedres cati</i>
35	33	5	2
34.6 %	32.7 %	4.9 %	1.9 %
	94.3 % of all positive	14.3 % of all positive	5.7 % of all positive

A large number of the cats had dark cerumen, which is symptomatic of an inflammation of the auditory canal, and in these cases the presence of *Otodectes cynotis* was confirmed.

The odour of many of the swabs was very strong. Where the ears were clean, i.e. without black-brown cerumen or scabs, the parasitological examinations were generally negative.

In our study, ectoparasites were found in the ears of 34.6 % of the examined cat carcasses. One cat was infested with both *Felicola subrostratus* and *Otodectes cynotis*; two others were infested with all three of the ectoparasites (*Otodectes cynotis*, *Notoedres cati* and *Felicola subrostratus*).

Discussion

Dermatitis, which is primarily caused by ectoparasites, can be located on the head area, neck and periauricular region. The *Otodectes cynotis* mites can migrate from the ear to the neck where it can cause alopecia. The parasites may

also migrate into the auditory canal, which is uncommon for the *Notoedres cati* and *Felicola subrostratus* mites. Animals may be without symptoms and may only be carriers.

Dirt, dark cerumen and debris in the auditory canal indicate the presence of parasites. In similar research performed by Raschka et al. in 1990-92, where 111 stray cats were examined, the results were comparable. They found *Otodectes cynotis* in 27.9 % of the cats, *Felicola subrostratus* in 12.6 % and *Notoedres cati* in 1.8 % cats, however, they examined the entire cat, not just the auditory canal as we did.

Sabolić wrote about 'otitis externa parasitaria' (inflammation of the external ear caused by parasites), which was established in 19.9 % of the cats examined, where the cause was *Otodectes cynotis* and the inflammations were purulent and eczematous (7).

Sotiraki et al. (2) found *Otodectes cynotis* in 41 out of 161 cats (25.5 %), with 9 of the cats (16.1 %) being heavily infested – more than 5 parasites

could be seen in the microscope's field of vision. They washed and massaged the ears with 1-2 ml mineral oil before aspirating the material from the ear for examination. They commented that washing the ears is more effective than taking a smear with cotton wool, especially if the infestation is only slight.

Otosopic examinations of 200 cats by Akucewich et al. (8) found that *Otodectes cynotis* was present in 45 cats (22.5 %). They reported that 74 cats (37 %) had infestations in both ears. In 1969, Vuković reported on an invasion of *Notoedres cati* in the former Yugoslavia that affected about 1.2 % of the country's carnivorous animals (9).

References

1. Raschka C, Ribbeck R, Haupt W. Untersuchungen zum Ektoparasitenbefall bei streunenden Katzen. *Mh Vet Med* 1994; 49: 257-61.
2. Sotiraki ST, Koutinas AF, Leontides LS, Adamama-Moraitou KK, Mimonas CA. Factors affecting the frequency of ear canal and face infestation by *Otodectes cynotis* in the cat. *Veterinary Parasitology* 2001; 96: 309-15.
3. Mehlhorn H, Mehlhorn B. *Gesunde Katzen*. Bochum: Springer Verlag, 1993: 75-84.
4. Kraft W, Kraiss-Gothe A, Gothe R. *Die Otodectes cynotis – Infestation von Hund und Katze: Erregerbiologie, Epidemiologie, Pathogenese und Diagnose sowie Fallbeschreibungen generalisierter Räuden bei Hunden*. *Tierärztl. Prax.* 1988; 16: 409-15.
5. Wall R, Shearer D. *Veterinary Ectoparasites: Biology, Pathology and Control* 2nd edition. London: Blackwell science, 2001: 33-39, 173-174.
6. Unknown. *Manual of veterinary parasitological laboratory techniques*. *Techn Bull* 1979; 18: 96-8.
7. Sabolić M. Najčešće bolesti u pasa i mačaka s posebnim osvrtom na raširenost, dajagnostiku i liječenje – veterinarska stanica Varaždin. *Vet. stanica* 1997; 28: 329-35.
8. Akucewich LH, Philman K, Clark A, Gillespie J, Kunkle G, Nicklin CF, Greiner EC. Prevalence of ectoparasites in a population of feral cats from north central Florida during the summer. *Veterinary Parasitology* 2002; 109: 129-39.
9. Vuković V. Prilog poznavanju parazitaranih oboljenja mesojeda. *Veterinaria (Sarajevo)* 1959; 8: 605-10.

ZUNANJI ZAJEDAVCI *OTODECTES CYNOTIS*, *FELICOLA SUBROSTRATUS* IN *NOTOEDRES CATI* V UŠESU PRI MAČKAH

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Povzetek: V letih 1998-99 smo pregledali 101 potepuško mačko iz ljubljanske regije na prisotnost zunanjih zajedavcev v ušesu. Trupla potepuških mačk, ki so bile usmrčene iz medicinskih vzrokov, ki so jih ustrelili lovci ali pa so poginile zaradi posledic prometnih nesreč ali različnih bolezni, so bila prepeljana na oddelek za patologijo. Odvzeli smo brise iz ušesnega kanala, kjer smo z vatirancem obrisali notranjost obeh ušes s krožnimi gibi. Ušesni brisi so bili takoj obdelani z 10 % KOH, bombažni bris z vzorcem se je nekaj minut kuhal v 10 % KOH. Ugotovili smo, da je bilo 65,3 % mačk neinvadiranih, 34,65 % pa invadiranih. *Otodectes cynotis* smo ugotovili pri 33 mačkah (32,7 %), *Felicola subrostratus* pri 5 mačkah (4,95 %) ter *Notoedres cati* pri 2 mačkah (1,98 %).

Ključne besede: zunanji zajedavci; uho; potepuške mačke