

PREVALENCE OF ENDOPARASITES IN CATS FROM TWO URBAN AREAS IN SOUTHERN ROMANIA: PRELIMINARY DATA

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Abstract: Domestic cats can act as reservoir for many intestinal parasites. Furthermore, these animals play an important role in parasite transmission to human and other animals by contamination of the environment with faecal parasite stages. The purpose of this study was to investigate the endoparasite community of domestic cats from two urban areas in Southern Romania. For this, a total number of 120 cats were included in the study. From them, fecal samples were collected and examined, first grossly, then using a sodium chloride flotation technique followed by microscopy for identification of parasitic elements (eggs, oocysts). For a subset of 69 samples a Baermann method was performed for detection of lungworm nematodes. The overall prevalence of gastrointestinal parasites was 26.7% (32/120; 95%CI:0.19–0.35) and 2.9% (2/69; 95%CI:0.003–0.10) for lungworm, respectively, in the examined samples. Five endoparasite species, including helminthes (nematodes, cestodes) and protozoa were detected. The most prevalent species were *Toxocara cati* (12.5%) and *Isospora felis* (12.5%), followed by *Aelurostrongylus abstrusus* (2.9%), *Ancylostoma tubaeforme* (1.7%), and *Dipylidium caninum* (0.8%). For two samples (1.7%), mixed infection (*T. cati* + *Ae. abstrusus* and *T. cati* + *A. tubaeforme*) was diagnosed. In conclusion, the results are particularly of veterinary importance as these parasites commonly affect the animal health, suggesting the need for parasitological control. In addition, due to the zoonotic potential of some of these parasites, potential risks for the human health have to be considered.

Key words: cats, endoparasites, urban areas, risk factors

INTRODUCTION

Endoparasitoses of cats are caused by a large range of parasitic species from different taxonomic units, such as protozoa and helminths. These parasites are the main cause of various clinical signs, from gastrointestinal disorders in cats (Calvete et al., 1998), to anemia or anorexia in the more severe cases (Traversa, 2012). Furthermore, stray cats play an important role in parasite transmission to human and other animals by contamination of the environment with faecal parasite stages (Khademvatan et al., 2014).

It is well known that *Toxocara cati* and *Ancylostoma tubaeforme* are responsible for human visceral/ocular and cutaneous larva migrans, respectively but also *Dipylidium caninum* can infect humans (Robertson and Thompson, 2002; Deplasez et al., 2011). Other non-zoonotic parasites are also important in cats (i.e, *Isospora*) because can cause digestive disorders, like diarrhea and malabsorption in its hosts (Borji et al., 2011; Barutzki and Schaper, 2013).

Therefore, the importance of parasite control is not only to cure clinical signs in infected cats, but also to minimize the contamination risks and transmission of these parasites to other animals or to humans (Borji et al., 2011).

The aim of this study was to investigate the endoparasite populations of domestic cats from urban areas in Southern Romania.

MATERIALS AND METHODS

In the present study, a total number of 120 cats (69 females; 51 males), originated from two urban areas [B (n=102) and C (n=18)] in Southern Romania were copro-parasitological investigated. Data about their age (kitten ≤ 1 year; adult >1 year), outdoor access, and anthelmintic treatments were recorded, as provided by the owners.

Fresh fecal samples, collected from the cats, were examined, first grossly, then using a sodium chloride flotation technique followed by microscopy for identification of parasitic elements (eggs, oocysts). For a subset of 69 samples a Baermann method was performed for detection of lungworm nematodes.

RESULTS AND DISCUSSION

The coproscopical examination of the samples showed infestations with one protozoa and four helminthes species; an overall prevalence of gastrointestinal parasites of 26.7% (32/120; 95%CI:0.19–0.35) and 2.9% (2/69; 95%CI:0.003–0.10) for lungworm, respectively was registered. The most prevalent species were *Toxocara cati* (12.5%) (Fig. 1A) and *Isospora felis* (12.5%) (Fig. 1B), followed by *Aelurostrongylus abstrusus* (2.9%) (Fig. 1C), *Ancylostoma tubaeforme* (1.7%) (Fig. 2a), and *Dipylidium caninum* (0.8%) (Table 1).

For most fecal samples, infestation with a single parasites species was found. However, for two samples (1.7%), mixed infection (*T. cati* + *Ae. abstrusus* and *T. cati* + *A. tubaeforme*) was diagnosed.



Figure 1. Parasitic stages microscopically identified using flotation technique (A, B) and Baermann method (C) in feces of cats from urban areas in southern Romania: **A)** eggs of *Toxocara cati* (x10); **B)** oocysts of *Isospora felis* (x20); **C)** larva of *Aelurostrongylus abstrusus* (x20)



Figure 2. Mixed infection with a. *Ancylostoma tubaeforme* and b. *Toxocara cati* (parasitic stages identified using flotation technique; x20)

Infestations with helminthic stages were found in 14.1% (17/120) of the domestic cats included in the study. The most common helminth was *T. cati*, found in 12.5% (15/120) of the examined samples. Protozoa infections were found in 15 (12.5%) samples of the total cats examined.

Table 1. The frequency and prevalence of individual parasites identified by coproscopy in domestic cats from two urban areas in Southern Romania

Parasite species	Frequency (number positive/number examined)	Prevalence (%)
<i>Isospora felis</i>	15/120	12.5
<i>Toxocara cati</i>	15/120	12.5
<i>Aelurostrongylus abstrusus</i>	2/69	2.9
<i>Ancylostoma tubaeforme</i>	2/120	1.7
<i>Dipylidium caninum</i>	1/120	0.8

These findings, analyzed according to the age of animals, show a higher prevalence (44.0%) of endoparasites in kittens compared to the adult cats (17.7%).

Single parasitic infection predominated with a prevalence of 25.0%, while multiple parasitic infections had a prevalence of 1.7%. There was no significant difference in terms of parasitic infection between male (29.4%) and female (24.6%) cats (Table 2).

Similar studies, performed by Barutzki and Shaper (2003, 2011) shown that puppies and young animals under one year are more often infected with endoparasites than adult animal; this is in agreement with the results obtained in our study

A study conducted by Cantó et al. (2013) shows a prevalence of 36% of single infections and 7% of mixed infections; these results are accordingly with those obtained in our study. Engbaek et al. (1984) suggests that mixed infections are rare in cats since these have a higher resistance of them.

Table 2. Prevalence of gastrointestinal parasites found in cats from two urban areas in Southern Romania, according to their age and gender

Parasite species	Age		Gender	
	Kittens ≤1 year <i>n</i> =41	Adult >1year <i>n</i> =79	Male <i>n</i> =51	Female <i>n</i> =69
<i>Toxocara cati</i>	10 (24.4%)	5 (6.3%)	9 (17.6%)	6 (8.7%)
<i>Ancylostoma tubaeforme</i>	2 (4.9%)	0	1 (2.0%)	1 (1.4%)
<i>Dipylidium caninum</i>	0	1 (2.3%)	0	1 (1.4%)
<i>Isospora felis</i>	7 (17.1%)	8 (10.1%)	6 (11.8%)	9 (13.0%)
Total animals infested	18 (44.0%)	14 (17.7%)	15 (29.4%)	17 (24.6%)

Comparing our data with data reported from other similar studies, the prevalence values for some parasite species are similar, while for other species various results are obtained, according to different risk factors.

A study conducted in Ontario (Shukla et al., 2006) has reported a similar prevalence of *T. cati* (12.2%). In a recent study conducted in Europe by Beugnet et al. (2014), it is shown that cats with infrequent outdoor access (11.5%) were significantly less frequently infested with *T. cati* than cats having frequent access (23.0%) to the outdoors. In Romania, Mircean et al. (2010) reported a prevalence of *T. cati* (10.2%) from urban cats lower than that of the present study.

With regard to *Isospora* spp., the prevalence found in this study (12.5%) agrees with the data obtained by Mircean et al. (2010), they reported that the prevalence of *I. felis* infection was higher in cats less than 1-year old (11.6%) than adult cats (1.2%).

Khademvatan et al. (2014) detected *Isospora* spp. with a prevalence of 21.4% in the collected samples from different geographical areas of Iran.

The low prevalence of *A. abstrusus* (2.9%; 2/69) observed in the present study is in agreement with similar studies from our country (5.6%) (Mircean et al., 2010) or European countries (4.1%; Beugnet et al. (2014); however, a recent study from Italy reported a higher prevalence (26.5%) for this parasite (Genchi et al., 2014).

A. tubaeforme was found in a lower prevalence (1.7%) comparing to other studies in Romania (10.1% found in Transylvania (Mircean et al., 2010). In other countries, prevalence of this species found by coproscopical examination was variable: 0.3-0.4% in Germany (Barutzki and Schaper, 2003; 2011), 11.1% in Hungary (Capari et al., 2013), or 19.1% in Portugal (Waap et al., 2014).

The overall frequency of *Dipylidium caninum* (0.8%) obtained here is higher to those obtained by Barutzki and Schaper (2011) (<0.1%) in a previous study performed in Germany, but lower than the prevalence obtained by Kademvatan et al. (2014) (2.9%) from stray cats (Iran) and much lower than that obtained by Mohsen and Hossein (2009) in Iran (68.1%).

As the studies showed, endoparasites are common in domestic cats. Since, some of the parasites may impact the health of animals and some are known agents of zoonotic diseases, measures should be taken to appeal more attention to cats by both veterinarians and owners.

CONCLUSIONS

1. The coprological investigation performed on cats from two urban areas in Southeastern Romania showed a prevalence of 26.7% for gastrointestinal parasites and 2.9% for lungworm, respectively.
2. The proportion of helminthic infections (14.1%) did not differ significantly than those of protozoan (12.5%).
3. Kittens had a higher prevalence (44.0%) of parasitic infection than adult cats (17.7%).
4. A higher prevalence of *T. cati* was registered in kittens (24.4%) than in adult cats (6.3%).
5. These results are particularly of veterinary importance as these parasites commonly affect the animal health, suggesting the need for parasitological control. In addition, due to the zoonotic potential of some of these parasites, potential risks for the human health have to be considered.

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