

## THE ROLE OF CATS IN TRANSMISSION OF ENDOPARASITES WITH ZOOBOTIC POTENTIAL

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*Cats have a socio-cultural importance and the interactions between them and humans have benefits for individual's health, but they also raise a risk for the transmission of zoonotic diseases. The role of cat as host of endoparasites that can be transmitted to humans has been worldwide recognized as a public health problem. Depending on the causative agent, manifestations of the zoonotic diseases vary from visual, neurologic, dermatologic, respiratory and gastro-intestinal disorders; some of them having a significant influence for human health. The objective of the present study was to evaluate the prevalence and the risk factors of parasitic infections with zoonotic potential in domestic cats from urban areas in Southern Romania. In order to accomplish this objective, 131 fresh feline faecal samples were collected and examined for oocyst of protozoa and for eggs of helminthes using a flotation technique followed by microscopy. Parasitic elements were identified in 25.2% (33/131; 95%CI:0.18-0.33) of samples. Amongst the identified parasitic species, three have zoonotic potential, namely: *Toxocara cati* (11.5%), *Ancylostoma tubaeforme* (1.5%) and *Dipylidium caninum* (0.8%). Additionally, parasite species with veterinary importance have also been detected (*Isospora felis*, 12.2%). These findings emphasize that cats from urban areas are carriers for zoonotic parasites and suggest potential risks for public health.*

**Keywords:** cats, endoparasites, urban areas, zoonosis, public health

### INTRODUCTION

Pets have a socio-cultural importance and the interactions between them and humans have benefit for individual's health, but they also raise a risk for the transmission of zoonotic diseases<sup>1</sup>. The role of cat as host of endoparasites that can be transmitted to humans has been worldwide recognized as a public health problem<sup>2</sup>. Depending on the causative agent, manifestations of the zoonotic diseases may vary from visual<sup>3</sup>, neurologic, dermatologic<sup>4</sup>, respiratory and gastro-intestinal disorders; some of them having a significant influence for human health<sup>5</sup>. For example, *Toxocara cati* and *Ancylostoma tubaeforme* can induce visceral or cutaneous larva migrans, respectively<sup>6</sup>. Humans can get infected by ingestion of embryonated eggs of *Toxocara cati* present in the environment contaminated by cat feces<sup>7</sup>. Infections are followed by the migration of third-stage larvae through the tissues which is usually asymptomatic but may be associated with a variety of non-specific clinical aspects<sup>8</sup>. *Ancylostoma tubaeforme* can also infect human beings and cause disease<sup>9,6</sup>. Migration of *Ancylostoma* spp. larvae is responsible for a linear, sinuous, erythematous, and intensely pruriginous eruption of the human skin namely human cutaneous larva migrans<sup>4</sup>.

Humans may also become infected with zoonotic cestodes from cats such as *D. caninum*<sup>10</sup>, when they accidentally ingest infected fleas<sup>11</sup>. Infection is usually asymptomatic, but some patients may show loss of appetite, indigestion, abdominal pain like colic, irritability, constipation /diarrhea, prurigo, insomnia and occasionally can have hives and eosinophilia. Parasitic zoonosis represents a problem for public health in every countries, because of the fact that pets are the main reservoirs of infection or transmitting pathogens that cause human diseases<sup>12</sup>. The objective of the present study was to evaluate the prevalence and risk factors for parasitic infections with zoonotic potential in domestic cats from urban areas in Southern Romania.

### MATERIAL AND METHODS

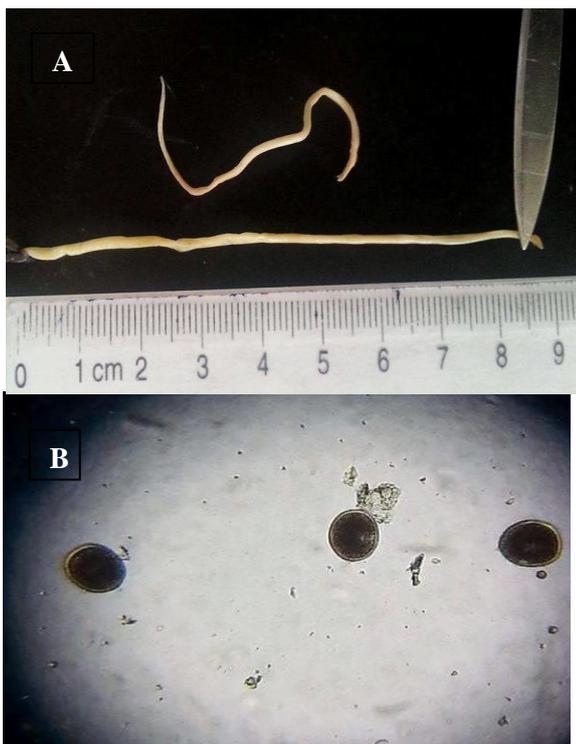
A total number of 131 domestic cats (55 male and 76 female) were included in the study. Fresh fecal samples were collected and examined first grossly (for the presence of adult roundworms and proglottids of cestodes), and afterward using a flotation technique followed by microscopy in order to identify parasitic elements (oocyst of protozoa and eggs of helminthes).

## RESULTS AND DISCUSSIONS

Parasitic elements were identified in 25.2% (33/131; 95%CI: 0.18-0.33) of the samples. Amongst the parasitic species identified, three have zoonotic potential, namely: *Toxocara cati* (11.5%) (Figure 1), *Ancylostoma tubaeforme* (1.5%) (Figure 2) and *Dipylidium caninum* (0.8%). Additionally, parasite species with veterinary importance have also been detected (*Isospora felis*, 12.2%) (Figure 3) (Table 1). For one sample (0.8%), mixed infection (*Toxocara cati* and *Ancylostom tubaeforme*) was diagnosed.

Parasites species	Frequency (number positive/number examined)	Prevalence (%)
<i>Toxocara cati</i>	15/131	11.5
<i>Ancylostoma tubaeforme</i>	2/131	1.5
<i>Dipylidium caninum</i>	1/131	0.8
<i>Isospora felis</i>	16/131	12.2

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



**Figure 1.** Parasite species identified in feces of cats from urban areas in southern Romania: **A)** *Toxocara cati* adults worms, macroscopically identified; **B)** eggs of *Toxocara cati*, microscopically identified using flotation technique (x10)



**Figure 2.** Eggs of *Ancylostoma tubaeforme* (x10)



**Figure 3.** Oocysts of *Isospora felis* (x20)

In a recent study conducted in Europe by Beugnet *et al.*<sup>9</sup>, it is emphasized that cats with infrequent outdoor access had a similar prevalence for *Toxocara cati* to the prevalence found in this study (11.5%). It is well known that *Toxocara* spp. is responsible for human visceral larva migrans (VLM), ocular larva migrans (OLM) and covert toxocarosis (CT). Furthermore association with neurological and atopic symptoms has also been described<sup>13</sup>. Clinical manifestations vary from no symptoms to eosinophilia (which is often severe and sometimes represents the only sign of infection) or lung, hepatic, ocular and neurological forms (in those, eosinophilia may be modest or absent)<sup>14</sup>.

In a study conducted by Saporito *et al.*, the authors affirmed that, in developed countries, after oxyuriasis, toxocarosis is considered to be the second most common helminth infection<sup>14</sup>. The overall frequency of *A. tubaeforme* (1.5%) and *D. caninum* (0.8%) described here are higher to those obtained by Barutzki and Schaper (0.2%; <0.1%, respectively) in a previous study performed in Germany<sup>15</sup>.

The hookworms, such as *A. tubaeforme* can cause zoonotic disease<sup>6</sup>. The migration of *Ancylostoma* spp. larva can produce dermatological lesions namely cutaneous larva migrans and less frequently eosinophilic pneumoniae, localized myositis, folliculitis, erythema multiforme or ophthalmological manifestations<sup>4</sup>. This dermatosis is caused by infective larval form of the pet hookworm which may accidentally penetrate the human intact skin and then wander through the epidermis<sup>16</sup>.

*Dipylidium caninum* has been rarely implicated in human infection which can cause a zoonotic parasitic infestation. Dipylidiasis appears predominantly in infants and preschool

children, due to close contact they have with their pets. Children become infected by the same mechanism as dogs and cats: ingesting fleas infected with *D. caninum* cisticercoides larvae<sup>12</sup>. Information on transmission, clinical disease and prevention of these common zoonotic diseases should be available to public<sup>6</sup>.

## CONCLUSIONS

The findings of this study indicate that infections with parasites which had zoonotic potential (*T. cati*, *A. tubaeforme* and *D. caninum*) are quite frequent in domestic cats from urban areas. Overall, the results emphasize that cats from urban areas are carriers for zoonotic parasites and suggest potential risks for the public health.

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