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Research article

PREVALENCE OF INTESTINAL PARASITES IN DOGS AND CATS FROM THE KVARNER REGION IN CROATIA

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Intestinal parasites of dogs and cats may affect their health with a significant zoonotic risk to public health. Therefore, establishing an efficient control program should pass through the determination of the diversity, prevalence, and pathogenicity of those parasites. This study aimed to determine the prevalence of intestinal parasites in dogs and cats and proceed to infection comparisons between young and adult animals. The detection of parasites in fecal samples was determined using flotation and immunofluorescent methods across 320 dogs and 64 cats from the Kvarner region in Croatia. The prevalence was calculated for each detected parasite in its host. Differences in prevalence between young animals and adults were analyzed. Parasites were detected in 32 dogs and 34.4% of cats. In total, 12 different genera were detected; Giardia spp. was the most prevalent parasite in both species, infecting 24.7% and 18.8% of investigated dogs and cats, respectively. *Cryptosporidium* spp. and *Toxocara cati* had a prevalence of (18.4%) and (6.3%), respectively. Prevalences of *Giardia spp.*, *Cryptosporidium spp.*, and *Cystoisospora spp.* were significantly ($P < 0.05$) higher in puppies compared to adult dogs. *Pentatrichomonas hominis* (*P. hominis*) was detected in one puppy. In addition to the first report of *P. hominis*, a relatively high prevalence of intestinal parasites in dogs and cats in the Kvarner region of Croatia was recorded, posing a potential zoonotic risk.

Keywords: cats, Croatia, dogs, intestinal parasitic infection, prevalence

INTRODUCTION

Dogs and cats can harbour various intestinal parasites, which can cause gastrointestinal disturbances [1]. Many of these parasites have a zoonotic potential, posing a risk to the human population. Thus, epizootiological studies aimed to determine the presence and the prevalence of parasites within pet populations represent a relatively simple,

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efficient, and useful source of information for practitioners in veterinary and human medicine.

Common intestinal parasites in dogs and cats from the Middle-European region include protozoans like *Giardia* spp., *Cryptosporidium* spp., *Sarcocystis* spp., and *Cystoisospora* spp., roundworms *Toxocara* spp. and *Toxascaris* spp., hookworms *Ancylostoma* spp. and *Uncinaria* spp., whipworm *Trichuris vulpis*, bladder worm *Capillaria plica* and flatworms *Dipylidium* spp. and *Taenia* spp. [2,3]. These parasites are considered significant as they might cause diarrhoea and malabsorption in their hosts. In young dogs and cats, some parasites are responsible for weight loss and the normal development of an animal. In clinical cases, severe dehydration and even death can occur [4].

Commonly, the most prevalent intestinal parasites in dogs and cats are protozoans, especially *Giardia,* which explains the importance of the research on its zoonotic and epizootiological potential [5]. A study showed that the prevalence of giardiasis in humans is generally low in developed countries compared to developing countries [6]. Poor hygiene, low standards, and overcrowding may play an important role as possible zoonotic factors in transmission by cohabiting pet dogs [7].

Undisposed dog faeces positive for zoonotic and non-zoonotic intestinal parasites and environmental contamination have been reported in city parks, which make them potential sources of protozoan and worm infections for dogs and humans [8]. In another study, authors found a significant association between dogs who attended parks and *Giardia* spp./*Cryptosporidium* spp. infection [9]. Also, public shelters present a significant source of infection due to close cohabitation and poor hygienic conditions [2].

The constant presence of zoonotic intestinal parasites in dogs and cats indicates the need for planned, systematic, and adequate parasite control programs, which would ultimately positively affect human health. One of the first steps towards this goal should be a precise and detailed determination of the parasites' diversity, prevalence, and pathogenicity.

The aim of this study was to determine the presence and prevalence of intestinal parasites in dogs and cats from the Kvarner region in Croatia through coprological analyses. Furthermore, the prevalence of multiple infections and the differences in the number of infections between young and adult dogs and cats were assessed.

MATERIALS AND METHODS

Ethical statement

This research is not related to the use of animals. No ethical approval was obtained because this study did not involve animals but only non-invasive procedures (collecting faecal samples from the environment).

Animals and sampling

A total of 384 fecal samples were collected between January 2019 and January 2021 from privately owned dogs (n=293; 138 females and 155 males) and 27 dogs from one shelter (19 females and eight males), and privately owned cats (n=64; 38 females and 26 males) from different parts of Kvarner region for a coprological examination. Basic information on examined dogs and cats is summarised in Table 1 and Table 2, respectively. Collected samples represented a mixture of clinically healthy animals and animals demonstrating clinical symptoms indicative of intestinal parasitism (e.g. diarrhoea, failure to gain weight) [10].

Table 1. Basic demographics of the dogs (N = 320) whose feces were examined

Breed	187 mix breed; 35 unknown; 98 pure breeds (4 Cane Corso, 7 Maltese, 1 English bulldog, 5 German shepherd, 13 Labrador retriever, 1 Pitbull, 3 Bichon Frise, 5 Poodle, 4 Bernese Mountain, 3 Afghan hound, 8 Golden retriver, 3 German spitz, 5 Beagle, 2 Dalmatian, 1 German boxer, 1 Shar-pei, 2 Welsh Corgi, 2 West Highland White Terrier, 1 Greater Swiss Mountain, 2 Vizsla, 2 German short-haired pointer, 4 Cocker spaniel, 3 Irish setter, 1 Great Dane, 2 Miniature Schnauzer, 1 Siberian Husky, 1 Cavalier King Charles Spaniel, 1 Dogo Argentino, 1 Posavac Hound, 1 Dachshund, 4 Pugs, 1 Istrian short-haired hound, 2 Basset Hound, 1 English Cocker Spaniel and 1 Chihuahua)
Age	78 ≤ 6 months, considered as puppy; 207 > 6 months, considered as adult dogs; 35 unknown
Gender	163 male and 157 female
Use of anthelmintics (if any)	YES: 249 dogs ; NO: 36 dogs; UNKNOWN: 35 dogs 162 dogs ≤ 6 months; 87 dogs > 6 months
Dogs from animal shelters/household dogs	27 dogs from animal shelter; 293 household dogs

N – total number of samples

Table 2. Basic demographics of the cats (N = 64) whose feces were examined

Breed	54 mix breed; 10 pure breeds (3 Maine coon, 2 Persian cat, 3 British Shorthair, 1 Sphynx, 1 Russian Blue)
Age	11 ≤ 6 months, considered as kittens; 49 > 6 months, considered as adult cats; 4 unknown
Gender	26 male and 38 female
Use of anthelmintics (if any)	YES: 49 cats; NO: 15 cats 23 cats ≤ 6 months; 26 cats > 6 months
Household cats	64 household cats

N – total number of samples

For parasitological examination, dogs and cats were divided into two groups to test the possible relationship between age and the presence or absence of parasitism. Dogs

and cats were classified as puppies/kittens (≤ six months of age) and adults (> six months of age). The apparent prevalence of infections was calculated by dividing the number of animals diagnosed with a parasite on fecal examination by the total number of fecal examinations performed for each age group.

Questionnaire survey

Owners who participated in this study were asked to provide additional information in a questionnaire that contained questions on data of age, sex, breed, previous dehelmintisation, recent clinical symptoms consistent with intestinal parasitism, history of diagnosed intestinal parasites in the past, and stool consistency [11]. For 35 dogs and four cats, the age was unknown.

Collection and storage

All fecal samples (10 – 20 g approximately) were collected from the ground immediately after defecation by the instructed owners in a provided labelled, clean plastic cup and stored in a refrigerator at +4 °C. Microscopic examination was performed up to 48 hours after sample collection.

Methods

Parasitological examination. Firstly, a macroscopic examination of all samples for detecting proglottids of cestodes was performed. All admitted samples were divided into two parts of approximately 5-7 g each (if available). Each part was analysed in the diagnostic laboratory of the Croatian Veterinary Institute, Department Rijeka, with two different diagnostic methods: (1) standardised flotation method with saturated sodium chloride solution (specific gravity 1.2) [12] and (2) commercially available MERIFLUOR® *Cryptosporidium/Giardia* kit (Meridian Bioscience, Inc., SAD) by direct immunofluorescent detection procedure according to the manufacturer's instructions for simultaneous detection of *Cryptosporidium* spp. oocysts and *Giardia* spp. cysts by immunofluorescence assay.

Morphological determination. The sample was considered positive if at least one test showed a positive result based on morphological keys [13]. The species of parasites found were microphotographed and then classified according to genus, including *Giardia*, *Cryptosporidium, Cystoisospora, Pentatrichomonas*, *Toxocara*, *Toxascaris*, *Trichuris*, *Capillaria*, *Ancylostoma*, *Uncinaria*, *Dipylidium*, and *Taenia.*

Molecular diagnosis. For the exact diagnosis of trichomoniasis, parasite DNA was extracted using the QIAamp® Mini Kit (Qiagen, Hilden, Germany), according to the manufacturer's instructions. Further molecular diagnosis, including PCR, gel electrophoresis, DNA purification, and sequencing were done according to Felleisen, 1997. protocol [14].

Statistical analysis

Data were analysed using the statistical program TIBCO Statistica® [15]. Fisher exact test was used to determine the statistical significance of the differences in the prevalences of intestinal parasitic infections between young and adult dogs and cats. The confidence level was set at 95%, and the results were considered significant if $P < 0.05$.

RESULTS

Dogs

Parasitic forms were detected in 103 of 320 (32.2%) dogs with a 95% confidence interval (95% CI) of 27.1 - 37.6. Overall, 11 intestinal parasite species/genera were identified with flotation and direct immunofluorescent methods (Table 3).

Table 3. Proportions of single and multiple parasitic infection in dogs

Endoparasite infections	n. positive (prevalence)	95% CI
Single endoparasite infections		
Ancylostoma spp.	2 (0.6%)	0.08-2.2
Capillaria spp.	3 (0.9%)	0.2-2.7
Toxascaris leonina	4 (1.3%)	0.3-3.2
Toxocara canis	11 (3.4%)	1.7-6.1
Trichuris vulpis	3 (0.9%)	0.2-2.7
Uncinaria stenocephala	1 (0.3%)	0.01-1.7
Dipylidium caninum	1 (0.3%)	0.01-1.7
Giardia spp.	79 (24.7%)	20.1-29.8
Isospora spp.	8 (2.5%)	1.1-4.9
Cryptosporidium spp.	59 (18.4%)	14.3-23.1
Pentatrichomonas hominis	1 (0.3%)	0.01-1.7
Mixed endoparasitic infections		
Isospora spp.+ *Giardia* spp.	5 (1.6%)	0.5-3.6
Toxocara canis + *Capillaria* spp.	2 (0.6%)	0.08-2.2
Giardia spp. + *Cryptosporidium* spp.	18 (5.6%)	3.4-8.7
Isospora spp. + *Pentatrichomonas hominis*	1 (0.3%)	0.01-1.7
Toxocara canis + *Giardia* spp.	1 (0.3%)	0.01-1.7
Trichuris vulpis + *Toxocara canis*	1 (0.3%)	0.01-1.7
Giardia spp.+ *Uncinaria stenocephala*	1 (0.3%)	0.01-1.7
Trichuris vulpis + *Toxocara canis* + *Toxascaris leonina*	1 (0.3%)	0.01-1.7

n – number of positive samples, CI – confidence interval

The most common parasites were *Giardia* spp. and *Cryptosporidium* spp. Mixed infections were detected in 30 dogs, of which 18 had coinfection with *Giardia* spp. and *Cryptosporidium* spp. parasites. Overall prevalence in puppies and adults was 89.7% (95% CI = 80.8-95.5) and 47.3% (95% CI = 40.4-54.4), respectively. *Ancylostoma* spp., *Trichuris vulpis*, and *Dipylidium caninum* were detected only in adult dogs, while *Uncinaria stenocephala* and *Pentatrichomonas hominis* were detected only in puppies (Table 4). Puppies had a significantly ($P < 0.05$) higher prevalence of *Giardia* spp., *Cystoisospora* spp., and *Cryptosporidium* spp. parasites compared to adult dogs (Table 4). There was no significant difference ($P > 0.05$) between the prevalence in male (35.8%; 95% CI = 28.4-43.7) and female (28.5%; 95% CI = 21.6-36.2) dogs. The pooled prevalence of *Giardia* spp. and *Cryptosporidium* spp. was 43.1% (CI = 37.6-48.8).

Table 4. Prevalence of endoparasites in dogs according to age

Parasite	Age category						P-value
	Puppy (≤6 mo) N = 78			Adult (>6 mo) N = 207			
	n	Prev.	95% CI	n	Prev.	95% CI	
Ancylostoma spp.	/	/	/	2	1.0%	0.1-3.5	/
Capillaria spp.	1	1.3%	0.03-6.9	2	1.0%	0.1-3.5	0.618
Toxascaris leonina	1	1.3%	0.03-6.9	3	1.5%	0.3-4.2	0.698
Toxocara canis	2	2.6%	0.3-9.0	9	4.4%	2.0-8.1	0.381
Trichuris vulpis	/	/	/	3	1.5%	0.3-4.2	/
Uncinaria stenocephala	1	1.3%	0.03-6.9	/	/	/	/
Dipylidium caninum	/	/	/	1	0.5%	0.01-2.7	/
Giardia spp.	33	42.0%	31.1-54.0	44	21.3%	15.9-27.5	0.001
Isospora spp.	5	6.4%	2.1-14.3	3	1.5%	0.3-4.2	0.038
Cryptosporidium spp.	26	33.3%	23.1-44.9	31	15.0%	10.4-20.6	0.004
Pentatrichomonas hominis	1	1.3%	0.03-6.9	/	/	/	/

p<0.05, N – total number of samples, n – number of positive samples, CI – confidence interval, Prev – prevalence

Cats

Twenty-two of 64 (34.4%; 95% CI = 23.0-47.3) investigated cats were infected with intestinal parasites. Seven different intestinal parasite species/genera were identified with flotation and direct immunofluorescent methods, of which *Giardia* spp. and *Toxocara cati* were the most prevalent (Table 5). Infection with two parasites was detected in five cats (Table 5). Overall prevalence in kittens and adult was 27.3% (95% CI = 6.0-61.0) and 38.8 (95% CI = 25.2-53.8), respectively. In kittens, only *Giardia* spp. was found, which also had the highest prevalence in adult cats (Table 6). There was no significant difference ($P > 0.05$) between the prevalence of intestinal parasites in male (24.0%; 95% CI = 9.4-45.1) and female (27.5%; 95% CI = 14.6-43.9) cats.

Table 5. Proportions of single and multiple parasitic infection in cats

Endoparasite infections	n. positive (prevalence)	95% CI
Single endoparasite infections		
Capillaria spp.	1 (1.6%)	0.04-8.4
Toxocara cati	4 (6.3%)	1.7-15.2
Dipylidium caninum	1 (1.6%)	0.04-8.4
Taenia spp.	2 (3.1%)	0.4-10.8
Giardia spp.	12 (18.8%)	10.1-30.5
Isospora spp.	1 (1.6%)	0.04-8.4
Cryptosporidium spp.	1 (1.6%)	0.04-8.4
Mixed endoparasitic infections		
Toxocara cati + *Giardia* spp.	2 (3.1%)	0.4-10.8
Toxocara cati + *Capillaria* spp.	1 (1.6%)	0.04-8.4
Isospora spp. + *Dipylidium caninum*	1 (1.6%)	0.04-8.4
Giardia spp.+ *Cryptosporidium* spp.	1 (1.6%)	0.04-8.4

n – number of positive samples, CI – confidence interval

Table 6. Prevalence of endoparasites in cats acording to age

Parasite	Age category						P-value
	Kitten (≤6 mo) N = 11			Adult (>6 mo) N = 49			
	n	Prev.	95% CI	n	Prev.	95% CI	
Capillaria spp.	/	/	/	1	2.0%	0.05-10.9	/
Toxocara cati	/	/	/	4	8.2%	2.3-19.6	/
Dipylidium caninum	/	/	/	1	2.0%	0.05-10.9	/
Taenia spp.	/	/	/	2	4.1%	0.5-14.0	/
Giardia spp.	3	27.3%	6.0-61.0	9	18.4%	8.8-32.0	0.382
Isospora spp.	/	/	/	1	2.0%	0.05-10.9	/
Cryptosporidium spp.	/	/	/	1	2.0%	0.05-10.9	/

$p<0.05$, N – total number of samples, n – number of positive samples, CI – confidence interval, Prev – prevalence

DISCUSSION

Data on the prevalence of intestinal parasites in dogs and cats from Croatia are scarce. Thus, the primary aim of this study was to determine the prevalence of intestinal parasitic infection in a Croatian population of dogs and cats using the flotation and direct immunofluorescent method. Twelve different genera of intestinal parasites were found, and 32.2% of the examined dogs and 28.1% of the cats were infected. These findings correspond with the large-scale analysis in Germany, which found

that 32.2% of the dogs and 24.3% of the cats had intestinal parasites [16]. A larger overall prevalence of intestinal parasites in dogs from the Zagreb area, Croatia (48.1% - 64.9%) was reported in 2017 [17]. In our study, protozoan parasites were the most prevalent, and 5.6% of dogs had both *Giardia* spp. and *Cryptosporidium* spp. infections.

In this research, *Giardia* spp. was the most common parasite in dogs and cats. These results are in agreement with the report, which found *Giardia* spp. to be the most prevalent parasite in dogs (20.2%) and cats (36.0%) in Slovakia [3]. In a previous study in Zagreb, the prevalence of this parasite in dogs ranged between 23.8 and 26.7% [17]. Similarly, the prevalence of *Giardia* spp. was 28.47%, 23.75%, 25.1%, 27.53%, 25.89%, and 24.62% in dogs from Belgium, Germany, Spain, France, Italy, and the Netherlands, respectively [18]. However, our research used the direct immunofluorescence test for *Giardia* spp. detection, a more sensitive method than the SNAP *Giardia* test. A lower prevalence (7.0%) of *Giardia* spp. was detected in household and sheltered dogs from Central Italy [19]. In this research, puppies were more likely ($P < 0.05$) to have *Giardia* spp. than adults, which is consistent with the results of a similar previous study conducted in Colombia [1]. Also, *Giardia* spp. was the only parasite found in kittens. Regardless of clinical signs, *Giardia* spp. is ubiquitous in dogs and cats [20,21]. Considering that it has a zoonotic potential [22] and that prevalence of giardiasis in dogs can reach up to 43.9% [23], its zoonotic risk should not be overlooked.

Cryptosporidium spp. has been found in dogs and cats with different prevalences, and its presence can be associated with diarrhoea [24,25,20]. In this study, it was the second most prevalent parasite (18.4%) in dogs. The results in the Zagreb area between 2012 and 2015 stated that the prevalence of *Cryptosporidium* spp. in dogs ranged between 8.0% and 18.7% [17]. One meta-analysis showed that the pooled prevalence of *Cryptosporidium* spp. in the world is 8% and 3% in Europe, which indicates that the prevalence of this parasite in Croatia is relatively high [26]. Puppies seem twice as likely ($P < 0.05$) to have it than adults. High-level infection in puppies could be explained by the fact that the immune system of young animals is not fully developed [27,28]. A contributing factor to the high prevalence of *Cryptosporidium* spp., as well as of Giardia spp., might be the frequent contact with other animals from different epizootiological areas during tourist season. Kvarner region is a well-known tourist destination where tourists will likely arrive with their pets from different regions of Europe and the world.

Data about coccidian prevalence in Europe is scarce. In this study, *Cystoisospora* spp. was detected in adult cats and in both age categories of dogs. Moreover, significant ($P < 0.05$) differences were observed between the prevalence in puppies and adult dogs, with puppies being the more exposed group. This is in agreement with the research that found that the prevalence of *Cystoisospora spp.* in dogs significantly declined after four months of age [4]. [29] reported a higher prevalence of *Isospora felis* in cats younger than six months (9%) compared to older cats (2%). However, all investigated cats in their research showed symptoms of gastrointestinal disease.

Pentatrichomonas hominis (*P. hominis*) was found in one puppy, along with the *Cystoisospora* spp. The puppy had soft, malodorous diarrhoea. Several studies reported similar clinical signs in young dogs infected with this parasite [30,31,32]. Even though one study reported the prevalence of *P. hominis* in puppies from French kennels to be 15.8%, it is relatively rarely diagnosed in dogs and cats [33]. One reason for this might be that for its detection, highly specific and sensitive PCR assays need to be used [32]. However, due to its zoonotic potential, *P. hominis* may represent a serious health problem, and it is important to control its prevalence in domestic animal populations. To the best of our knowledge, this is the first report that *P. hominis* is involved in clinical diseases of dogs in Croatia.

Toxocariasis is one of the most common zoonotic parasitic infections worldwide [34,35]. As reported in a study, its prevalence can reach up to 33.5% in young sheltered dogs [2]. One of the most important sources of ground contamination with *T. canis* is free-roaming dogs [36], and human infection is possible by lying on the contaminated grass or soil [37]. Although most human infections with *T. canis* are subclinical, they may also cause severe clinical symptoms due to larval migration [38]. In this study, the prevalence of *T. canis* and *T. cati* was 3.4% and 6.3%, respectively. These results were lower than expected since the worldwide pooled prevalence of *T. canis*, and *T. cati* reported in large meta-analyses was 11.1% and 17.0%, respectively [34,39]. The relatively low prevalence of *T. canis* and *T. cati* in this study may be the result of concerned pet owners being under continuous veterinary control, with a higher degree of care and preventative measures. Indeed, 87% of dog owners (who answered that question) and 77% of cat owners stated that their pets were treated with anthelmintics. Similar prevalences to those obtained in this study were reported [11,17,1]. Even though young age is recognized as a risk factor for toxocariasis in dogs [40], results from this study showed non-significant ($P > 0.05$) differences in prevalences regarding age.

In this study, hookworms (*Ancylostoma* spp. and *Uncinaria stenocephala*) and *Trichuris vulpis* (*T. vulpis*) were found in 0.6%, 0.3%, and 0.9% of dogs, respectively. Eggs of *Ancylostoma* spp. and *T. vulpis* were found in adult dogs, while *Uncinaria stenocephala* was found in one puppy. Similar prevalence was reported in a study from Germany [11], although reports from South America stated that *T. vulpis* [41] and *Ancylostoma* spp. [1] were the second most common parasites in dogs, with a prevalence of 16.2% and 12.6%, respectively. However, one study reported a prevalence of hookworms of 0.7 – 0.9% in rural dogs and 0.4% in urban dogs in the Czech Republic [42]. The low prevalence of *Ancylostoma* spp., *Uncinaria stenocephala,* and *T. vulpis* might be due to regular dehelminthisation, or the samples might be taken in the prepatent period of the infection.

The prevalence of the *Taeniidae* and *Dipylidiidae* parasites was: 0.3% for *D. caninum* in dogs and 1.6% in cats, while 3.1% of cats had *Taenia* spp. All parasites were determined in adults. Relatively low prevalences of *D. caninum* and *Taenia* spp. determined by fecal

examination in this study probably do not represent the true prevalence, mainly because of the excretion behavior of the cestodes. Indeed, one study reported that cestodes were found in 1% of dogs after coprological examination, while post-mortem analysis revealed 46% of tapeworm-infected dogs [43]. Thus, in this study, the real prevalence of cestode infections in dogs and cats is probably much higher than recorded.

This study had a few limitations. Firstly, *Giardia* spp. is probably underestimated due to the intermittent excretion of *Giardia* cysts. Examination of just one fecal sample, as was done in this study, may produce false-negative results and underestimates the true prevalence value. This may also apply to the results for tapeworm prevalence. In this study, a flotation method with a saturated sodium chloride solution was used to detect *Taenia* spp. In contrast, the most common method is flotation with a saturated solution of zinc sulphate. The second limitation was poor anamnesis provided by the owners in the questionnaire, particularly in describing the presence and the character of diarrhoea. If the information were provided, it could aid in interpreting the laboratory findings, as the causes of diarrhoea are not always infectious. Some authors stated that most cases of chronic diarrhoea in dogs are not infectious but rather inflammatory enteropathies that are food, antibiotic, or steroid responsive [44].

CONCLUSION

This study showed a considerably high prevalence of intestinal parasites in dogs and cats in the Kvarner region, Croatia. Findings may indicate a potential zoonotic risk, especially in the case of *Giardia* spp., *Cryptosporidium* spp., and *Toxocara* spp., which in this study were the most prevalent parasites. The investigated population of dogs and cats is well-cared, but the higher occurrence of detected *Giardia* spp. advocates the need for more effective deworming schemes, regular faecal examinations, and cleaning up faeces from the soil. *P. hominis* was detected for the first time in dogs in Croatia, and it might be a causative agent of the clinical disease in puppies.

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Authors' contributions

SF conceived and designed the study, and wrote the manuscript together with IV. KTM, TA, and MP participated in collecting and analyzing the samples. They also revised the manuscript and made a substantial contribution to the interpretation of collected data. All authors read and approved the final manuscript.

Declaration of conflicting interests

The authors declare that they have no conflict of interest with respect to the research, authorship, and/or publication of this article.

Statement of Informed Consent

The owner understood procedure and agrees that results related to investigation or treatment of their companion animals, could be published in Scientific Journal Acta Veterinaria-Beograd.

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PREVALENCIJA CREVNIH PARAZITA KOD PASA I MAČAKA IZ REGIONA KVARNERA

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Paraziti intestinalnog trakta pasa i mačaka mogu da utiču na njihovo zdravstveno stanje uz značajan rizik po javno zdravlje. Iz tog razloga, uspostavljanje efikasnog programa treba da se zasniva na određivanju diverziteta, prevalencije kao i patognosti ovih para-

zita. Cilj ove studije je bio da se odredi prevalencija crevnih parazita kod pasa i mačaka kao i da se nastavi sa upoređivanjm infekcije kod mladih i odraslih životinja. Nalaz parazita u uzorcima fecesa obavljeno je korišćenjem metoda flotacije i imunofluorescencije i to iz 320 uzoraka poreklom od pasa i 64 uzoraka poreklom od mačaka, iz Kvarnerskog regiona Hrvatske. Utvrđena je prevalencija svakog dokazanog parazita u uzorcima fecesa njihovih domaćina. Isto tako, obavljena je i analiza razlika u prevalenciji parazita između mladih i odraslih životinja. Utvrđeno je prisustvo parazita u uzorcima poreklom od 32 psa i kod 34,4% mačaka. Ukupno je dijagnostikovano prisustvo 12 različitih vrsta parazita; kod obe vrste životinja ustanovljena je najveća prevalencija Giardia spp. koja je izazivala oboljenje kod 24,7% pasa i 18,8% mačaka. Prevalencija *Cryptosporidium* spp. je bila 18,4%, a prevalencija *Toxocara cati* 6,3%. Prevalencija *Giardia spp.*, *Cryptosporidium spp*. i *Cystoisospora spp*. bila je značajno ($P < 0,05$) veća kod štenadi u poređenju sa odraslim psima. *Pentatrichomonas hominis* (*P. hominis*) je dokazan kod jednog šteneta. Pored toga što se radi o prvoj prijavi invazije sa *P. hominis*, može da se zaključi postojanje relativno velike prevalencije intestinalnih parazita kod pasa i mačaka u Kvarnerskom regionu Hrvatske što svakako predstavlja potencijalni zoonotski rizik.