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Short communication

Gastrointestinal parasites of shepherd and hunting dogs in the Serres Prefecture, Northern Greece

M. Papazahariadou [a], A. Founta [b], E. Papadopoulos [a,*], S. Chliounakis [b], K. Antoniadou-Sotiriadou [a], Y. Theodorides [a]

[a] *Laboratory of Parasitology and Parasitic Diseases, Faculty of Veterinary Medicine, Aristotle University, 54124 Thessaloniki, Greece*

[b] *Department of Animal Production, Technological Research Institute, Sindos, Thessaloniki, Greece*

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Abstract

A total of 281 faecal samples from owned shepherd and hunting dogs were collected in the Serres Prefecture, Northern Greece and were examined for the presence of intestinal parasites. The overall prevalence of parasitism was 26% and the 11 species found were: *Toxocara canis* (12.8%), *Trichuris vulpis* (9.6%), *Giardia* spp. (4.3%), *Isospora* (*Cystoisospora*) spp. (3.9%), *Ancylostoma*/*Uncinaria* spp. (2.8%), *Cryptosporidium* spp. (2.8%), *Alaria alata* (2.5%), *Strongyloides stercoralis* (1.8%), *Angiostrongylus vasorum* (1.1%), *Toxascaris leonina* (0.7%) and *Dipylidium caninum* (0.3%). The prevalence of *T. canis* and *Isospora* (*Cystoisospora*) spp. was significantly higher in young than in adult dogs ($p < 0.05$). There was no significant difference in prevalence between genders, except for *T. canis*, which was more common in male dogs ($p < 0.05$).

Keywords: Gastrointestinal parasites; Protozoa; Helminths; Dog; Greece

1. Introduction

Intestinal parasites are among the most common pathogenic agents encountered by veterinarians dedicated to companion animals and they constitute one of the main causes of intestinal pathology in dogs. Among canine intestinal parasites, *Toxocara canis*, *Echinococcus granulosus*, *Ancylostoma* spp., *Giardia* spp. and *Cryptosporidium* spp. have also received great attention due to their zoonotic potential (Blagburn et al., 1996).

In Greece, data on the prevalence of intestinal parasites among dogs are available from faecal samples collected from the rectum of dogs in urban areas in Thessaloniki and Athens (Himonas, 1968; Katsinis et al., 1984; Haralabidis et al., 1988) and in the Serres Prefecture from faeces in public areas (Founta et al., 1999). No recent studies exist for other parts of Greece.

The aims of this investigation were: (1) to determine the prevalence of intestinal parasites among dogs, derived from faecal samples collected from the rectum of dogs in the Serres Prefecture, Northern Greece and (2) to evaluate parasite prevalence with respect to age, gender and use (shepherd or hunting).

2. Materials and methods

A total of 281 faecal samples were collected from shepherd and hunting dogs in Serres Prefecture from January 2003 to June 2004. All faecal samples were obtained from privately owned dogs presented to veterinary practitioners (e.g., for vaccination, injuries,

* Corresponding author. Tel.: +30 2310 999926; fax: +30 2310 999947.
E-mail address: eliaspap@vet.auth.gr (E. Papadopoulos).

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etc.). In some cases the veterinarians visited dogs at their home to take the samples.

The dog population studied included 164 hunting and 117 shepherd dogs. The first group included different breeds or crossbreeds (Setter, etc.) and all the dogs were used for hunting. The second group included the Greek shepherd dog or crossbreeds used exclusively as shepherd dogs for flocks of small ruminants living in urban environments. Both groups were in contact with humans, less so in the case of shepherd dogs and more so for the hunting dogs. One hundred and forty-two of the sampled dogs were male and 139 female, 65 were classified as young (up to 6 months of age) and 216 as adults (6 months to 10 years). Young dogs had deciduous teeth whereas adult dogs had permanent teeth.

Each faecal sample consisted of approximately 5 g of fresh stool, collected from the rectum of the dogs, and was accompanied by information about the gender, age, anthelminthic therapy (any drugs against intestinal parasites) and use of dogs (shepherd and hunting). This survey included only dogs that had not received any anthelmintic treatment in the last 4 months (according to the responsible veterinarian or owner) and only one dog belonging to each owner was sampled (selected at random).

Faecal examination was carried out using Teleman's sedimentation method (HCl acid and ether; Piekarski, 1973). Also, smears of the feces were prepared and stained with modified safranin-methylene blue stain (Visvesvara et al., 1997) to detect cysts of *Cryptosporidium*.

Descriptive statistics were calculated and in certain cases data were analyzed by ANOVA (SPSS version 14). The level of significance was set at $p < 0.05$.

3. Results

The overall prevalence of infestation with intestinal parasites was 26%. Infection with only one species of parasite was more common (61.6%) than infection with two (16.4%), three (17.8%) or four (4.1%) species. Detailed results in male/female and young/adult shepherd and hunting dogs are presented in Tables 1 and 2.

A high percentage (64.4%) of the owners reported that they used anthelmintics approximately three times per year. Among animals that received anthelmintics ($n = 181$), 24 (13.3%) were infected. More precisely, 6 out of 58 (10.3%) shepherd dogs and 18 out of 123 (14.6%) hunting dogs were infected. From the animals that did not receive any anthelmintic treatment ($n = 100$), 49 (49%) of them were found to be infected. More precisely, 24 out of 59 (40.7%) shepherd dogs and 25 out of 41 (61%) hunting dogs were infected. The most commonly used anthelmintics were pyrantel embonate with praziquantel (Drontal/Bayer), nitroscanate (Skanitrol/Pitman Moore) and praziquantel (Droncit/Bayer). None of the owners collected and removed their dog's faeces from their yards.

The prevalence of *T. canis* and *Isospora* (*Cystoisospora*) spp. was significantly higher in young than in adult dogs ($p < 0.05$). *T. canis* was more prevalent in male than in female dogs ($p < 0.05$).

4. Discussion

The prevalence (26%) of intestinal parasites estimated for owned dogs in this study was lower than in a previous investigation in the same area, which recorded a 62.6% prevalence of intestinal parasites in faecal

Table 1
Number and percent of infected dogs (shepherd and hunting) per worm species according to sex

Parasites	Shepherd dogs ($n = 117$)			Hunting dogs ($n = 164$)			Total (%) $n = 281$
	Male ($n = 62$)	Female ($n = 55$)	Total per dog category	Male ($n = 80$)	Female ($n = 84$)	Total per dog category	
Toxocara canis	14 (22.6%)	1 (1.8%)	15 (12.8%)	20 (25.0%)	1 (1.2%)	21 (12.8%)	36 (12.8%)
Trichuris vulpis	7 (11.3%)	3 (5.4%)	10 (8.5%)	10 (12.5%)	7 (8.3%)	17 (10.4%)	27 (9.6%)
Giardia spp.	4 (6.5%)	3 (5.4%)	7 (6.0%)	3 (3.8%)	2 (2.4%)	5 (3.0%)	12 (4.3%)
Isospora (*Cystoisospora*) spp.	3 (4.8%)	2 (3.6%)	5 (4.3%)	3 (3.8%)	3 (3.6%)	6 (3.7%)	11 (3.9%)
Ancylostoma/Uncinaria spp.	5 (8.1%)	2 (3.6%)	7 (6.0%)	1 (1.3%)	0	1 (0.6%)	8 (2.8%)
Cryptosporidium spp.	1 (1.6%)	4 (7.3%)	5 (4.3%)	2 (2.5%)	1 (1.2%)	3 (1.8%)	8 (2.8%)
Alaria alata	2 (3.2%)	1 (1.8%)	3 (2.6%)	3 (3.8%)	1 (1.2%)	4 (2.4%)	7 (2.5%)
Strongyloides stercoralis	1 (1.6%)	0	1 (0.9%)	3 (3.8%)	1 (1.2%)	4 (2.4%)	5 (1.8%)
Angiostrongylus spp.	2 (3.2%)	1 (1.8%)	3 (2.6%)	0	0	0	3 (1.1%)
Toxascaris leonine	0	0	0	2 (2.5%)	0	2 (1.2%)	2 (0.7%)
Dipylidium caninum	0	0	0	0	1 (1.2%)	1 (0.6%)	1 (0.3%)