

## The prevalence of intestinal helminths in owned dogs in Kerman city, Iran

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**Abstract.** In this survey, the prevalence of canine gastrointestinal helminths in dogs presented to the Veterinary Faculty of the University of Kerman; Iran, was measured between May and November 2011. A total of 70 fecal samples were evaluated by the fecal sedimentation method. The prevalence of gastrointestinal helminths was 7.14%. The most frequently detected parasites were *Toxocara canis* (4.3%); *Toxascaris leonina* (1.4%) and *Taenia* spp. (1.4%). The age distribution of intestinal parasites in dogs showed that dogs under 1 year old had a higher overall prevalence than dogs over 12 months of age ( $P < 0.05$ ). There was no significant difference in the prevalence between male (7.7%) and female (6.5%) dogs ( $P > 0.05$ ). It is thought that the reduction in the frequency of dogs with those helminths may be mainly a result of the improvement in breeding environment and the routine use of antihelmintics. The significance of zoonotic diseases caused by intestinal helminths makes it necessary for us to know the infection status of domestic dogs and to take measures for further control. It is concluded that veterinarians have an important role in educating dog owners of these potential risks and means for preventing or minimizing zoonotic transmission.

**Keywords:** Intestinal helminths; Dogs; Iran.

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### 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 pathologies of the intestinal tract in dogs (Ramirez-Barrios et al., 2004). Dogs and other canines act as definitive hosts for many intestinal parasites, some of which are responsible for several zoonotic diseases such as hydatidosis caused by the *Echinococcus granulosus* (Eslami, 2008; Razmi, 2009). In fact,

dogs are associated with >60 zoonotic diseases among which parasites in particular helminthiasis can pose serious health concern, as well as significant economic impact from veterinary standpoint (Ranjbar-Bahadori et al., 2008; Yagoob and Mashaei, 2011).

It is common to observe gastrointestinal helminths in canines of all ages, but the prevalence of infection is usually high in puppies, mainly due to the fact that certain modes of transmission are exclusive to the newly whelped or neonates, and also, because

young dogs have not yet acquired immunity to parasites (Asano et al., 2004; Soulsby, 1986). Geographically, a higher diversity of parasites is found in moderate, tropical and sub-tropical climates, where humidity and temperature conditions are appropriate for their development.

It is important to highlight the zoonotic aspects of some intestinal helminth infections in canines, which can represent a potential worldwide public health risk (Kirkpatrick, 1988; Ramirez-Barrios et al., 2004). This applies to traditionally acknowledged zoonotic diseases, such as visceral larval migrants caused by *Toxocara canis* and cutaneous larval migrants caused by *Ancylostoma braziliense* (Despommier, 2003; Pullola et al., 2006; Ramirez-Barrios et al., 2004).

Numerous epidemiologic studies of intestinal parasites in canines have been reported worldwide (Haralabidis et al., 1988; Lightner et al., 1978; Pullola et al., 2006; Ramirez-Barrios et al., 2004; Razmi, 2009; Yagoob and Mashaei, 2011). But there are no data available concerning epidemiology and prevalence of gastrointestinal helminths in owned dogs in the Kerman state of Iran. The main objective of this research was to determine the prevalence of gastrointestinal helminths in owned dogs presented to the Veterinary Faculty of the University of Kerman.

### Materials and methods

Between May and November 2011, fecal samples from 70 dogs were examined for the presence of parasites. All fecal samples were obtained from privately owned dogs presented to the Veterinary Faculty of the University of Kerman. Fecal samples were collected directly from the dog's rectum and were stored in 10% formalin neutral buffered solution until examination.

In examination of samples at first seeming disposition of the fecal samples were observed. Because in same time helminthic infection can be distinguished with survey by naked eye.

The coprological examinations were conducted by the direct smear method and the

sedimentation methods which include formalin/ether technique. The fecal samples were carefully examined using the 10× objective, field by field covering the entire coverslip. Each egg or cyst observed was identified by using their morphological characteristics previously described (Soulsby, 1986). A dog was classified as positive if at least one egg or cyst was observed.

Data were analyzed by SPSS software and Chi square test analysis. The significance level was  $P < 0.05$ .

### Results

*Toxocara canis* eggs (figure 1), *Taenia* spp. eggs (figure 2) and *Toxascaris leonina* eggs were found in 3, 1 and 1 stool samples, respectively. The overall prevalence of infection with gastrointestinal helminthic was 7.14 %. Of the 70 dogs evaluated, 5 samples were positive for at least one species of gastrointestinal helminths.

The most frequently observed parasite in this population was *T. canis* (4.3%), followed by *T. leonina* (1.4%), and *Taenia* spp. (1.4%) (table 1).

When the general prevalence was analyzed by age, it was observed that dogs <12 months old had a higher overall prevalence than those dogs over 12 months of age. There were significant differences in the prevalence of infection between dogs <12 months old and dogs over 12 months old (table 2) ( $P < 0.05$ ).

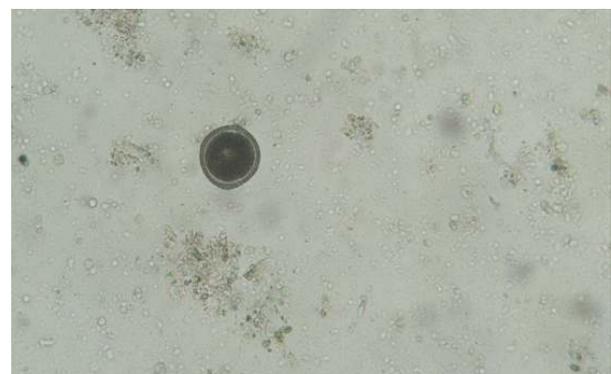


Figure 1. Unembryonated egg of *Toxocara canis*



Figure 2. Egg of *Taenia* spp

Table 1. Helminths found in owned dogs in Kerman

Species	No. of parasites	Positive rate (%)
<i>Toxocara canis</i>	3	4.3
<i>Taenia</i> spp.	1	1.4
<i>Toxascaris leonina</i>	1	1.4
<b>Total</b>	<b>5</b>	<b>7.1</b>

Table 2. Prevalence of gastrointestinal helminths in owned dogs according to age in Kerman

Age	NE	NI	Infected dogs (%)	Statistical Significance (X <sup>2</sup> )*
<12 months	30	4	13.3 <sup>a</sup>	a us b: P<0.05
>12 months	40	1	2.5 <sup>b</sup>	
<b>Total</b>	<b>70</b>	<b>5</b>	<b>7.1</b>	

NE – No. of dogs examined; NI – No. of infected dogs; \*Chi square test.

No significant difference in overall prevalence of gastrointestinal helminths was found between male (7.7%) and female (6.5%) dogs (P>0.05, table 3).

Table 3. The association between the prevalence of gastrointestinal helminths and sex in owned dogs

Sex	NI	NE	Infected dogs (%)	Statistical Significance (X <sup>2</sup> )*
Male	39	3	7.7 <sup>a</sup>	a us b: P>0.05
Female	31	2	6.5 <sup>b</sup>	
<b>Total</b>	<b>70</b>	<b>5</b>	<b>7.1</b>	

NE – No. of dogs examined; NI – No. of infected dogs; \*Chi square test.

## Discussion

The overall prevalence of gastrointestinal helminths in dogs was 7.14%. These results are in general conformed by Pullola et al. (2006), who reported a general prevalence of 5.9% in dogs in Finland (Pullola et al., 2006). Lightner et al. (1978) also reported less than 10% general prevalence in dogs in Iowa (Lightner et al., 1978). Similar results were obtained by Razmi (2009), who observed a general parasitic prevalence of 14.11% in dogs at Khorasan, Iran (Razmi, 2009). This similarity in values is probably due to the similarity between the populations studied, most of these fecal examinations carried out on dogs presented for veterinary care, in other words, the prevalence obtained through this study differs from that reported by Yagoob and Mashaei (2011) in Iran, and Ramirez-Barrios et al. (2004) in Maracaibo, who encountered canine parasitic general prevalence of 41% and 35.5%, respectively (Ramirez-Barrios et al., 2004; Yagoob and Mashaei, 2011). Also, our overall prevalence was lower than that found at the University of Pennsylvania Veterinary Teaching Hospital (Kirkpatrick, 1988) and in Thessaloniki (Haralabidis et al., 1988).

In this study, the general prevalence of intestinal helminths in dogs was higher in pups under 12 months of age than in dogs over 1 year old (P<0.05). The same aspect occurred with the specific prevalence of *T. canis*., which coincides with other studies (Kirkpatrick, 1988; Lightner et al., 1978; Pullola et al., 2006; Ramirez-Barrios et al., 2004).

All this suggests that in the case of the gastrointestinal helminths found specific immunity in dogs would develop with age, probably as consequence of one or more exposures.

The sex of dogs was not significantly associated with prevalence of gastrointestinal helminths in this study despite the higher frequency in males (7.7%) compared with females (6.5%) (P>0.05). A similar finding was reported by Ramirez-Barrios et al. (2004) (Ramirez-Barrios et al., 2004).

In this study, the overall prevalence of gastrointestinal helminths was lower than the results of other studies in World (7.14%). These results can be easily explained, because, most of previous studies were done in stray dogs that have no health control measure but most of the dogs in our study were dewormed regularly, also one action which could be put into practice immediately to reduce the prevalence of gastrointestinal helminths in infected animals is the introduction of a program of deworming to take place every 3 months together with parasitological analysis of the feces. Deworming of kittens, as mentioned above, should take place at 6-8 weeks of age.

The findings of this study confirm the declining trend in Kerman city in the prevalence of helminths in dogs. It is thought that the reduction in the frequency of the dogs with those helminths may be mainly a result of the improvement in breeding environment and the routine use of anti-helminthics.

The significance of zoonotic diseases caused by intestinal helminths makes it necessary for us to know the infection status of domestic dogs and to take measures for further control. It is concluded that veterinarians have an important role in educating dog owners of these potential risks and means for preventing or minimizing zoonotic transmission.

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