Prevalence of gastrointestinal parasites in dogs of Palampur, Himachal Pradesh

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Received: 26 October 2013 / Accepted: 11 May 2014 / Published online: 1 June 2014
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Abstract A total of 246 faecal/scat samples of the dogs were screened by direct and floatation concentration technique to study the gastrointestinal (GI) tract parasitism in dogs of Palampur, Himachal Pradesh, India. Detailed coprological examination targeting different seasons, age groups and living styles of the dogs revealed an overall 28.04 % of GI parasitism with highest prevalence in summer season (37.87 %). Stray dogs harbored 47.29 % GI parasites in comparison to 19.19 % of pet dogs. Highest prevalence of GI parasitism was observed in the pups, below 3 months of age (39.13 %), followed by the dogs with the age ranging from 3 months to 1 year (26.38 %) and lowest in dogs of the age ranging from 1 to 3 years (6.77 %). Amongst all the parasites, *Toxocara canis* (44.93 %) infection was highest, followed by *Dipylidium caninum* (17.39 %) and hookworms (15.94 %).

Keywords Dogs · Gastrointestinal parasites · Prevalence · Seasons

Introduction

Gastrointestinal tract (GIT) parasites of dogs are of significant importance, not only because of their adverse effects on hosts but also due to their significant zoonotic

potential. Various reports of GI parasites in dogs from different parts of the country are available (Chhabra et al. 2001; Sengupta and Yadav 2003; Sharma et al. 2006; Agnihotri et al. 2008; Ghosh et al. 2008; Khante et al. 2009) but the information from different parts of Himachal Pradesh, especially from Palampur (District Kangra) is scanty. Thus, present investigation was carried out to record the prevalence of GIT parasitism in dogs of Palampur, Himachal Pradesh, targeting different age groups, seasons as well as living styles.

Materials and methods

Faecal samples of 246 dogs (below 3 months of age, between 3 months and 1 year of age and between 1 and 3 years of age) were screened during the year 2010–2011 (March 2010–February 2011) by using standard methods: direct smear method as well as floatation concentration technique using Sheather's sugar solution (Soulsby 1982), to find out GI parasites in dogs through identification of eggs/oocysts. The comparisons were made age wise, season wise targeting all the seasons (winter, summer and rainy) as well as on the basis of living styles i.e. stray dogs and pet dogs for complete depiction of parasitism.

Results and discussions

In all, 69 (28.04 %) out of 246 cases of dogs were found positive for the eggs of one or other GIT parasite (Table 1). Chhabra et al. (2001) and Ramirez-Barrios et al. (2004) recorded 35 and 35.5 % prevalence of GI parasites, respectively, which were almost similar to that observed in the present study. However, Agnihotri et al. (2008) and

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Table 1 Seasonal prevalence of gastrointestinal parasites

Seasons	Total samples	Positive samples	<i>T. canis</i>	Hookworm eggs	<i>D. caninum</i>	Taeniid eggs	Coccidia oocysts	Mixed infection	
								<i>T. canis</i> + <i>D. caninum</i>	<i>T. canis</i> + hookworm eggs
Rainy (July–October)	65	17 (26.15)	11 (64.70)	2 (11.76)	2 (11.76)	–	2 (11.76)	–	–
Winter (November–February)	115	27 (23.47)	18 (66.67)	2 (7.4)	4 (14.81)	–	1 (3.7)	2 (7.4)	–
Summer (March–June)	66	25 (37.87)	2 (8)	7 (28)	6 (24)	3 (12)	5 (20)	–	2 (8)
Total	246	69 (28.04)	31 (44.93)	11 (15.94)	12 (17.39)	3 (4.34)	8 (11.59)	2 (2.9)	2 (2.9)

Values in parentheses depict the percentage

Legrottaglie et al. (2003) reported 59.20 and 19.84 % GI parasitism, respectively. The less number of positive cases observed in the present study could be due to age specific examination of the faecal samples i.e. below 3 years and also due to examination of the less number of faecal samples targeting only those dogs which had not undergone any anthelmintic treatment ever, including both pet and stray dogs. Amongst these positive cases, 31 (44.93 %) were found positive for *Toxocara canis* infection, followed by *Dipylidium caninum* 12 (17.39 %) and hookworms 11 (15.94 %). Eight (11.59 %) dogs were positive for coccidian oocysts, 3 cases (4.34 %) of taeniid eggs and 2 (2.9 %) cases of mixed infections involving *T. canis* with *D. caninum* and 2 (2.9 %) cases of mixed infections involving *T. canis* with hookworm sp. These observations were almost similar to the observations of Sharma et al. (2006) and Khante et al. (2009). However, Agnihotri et al. (2008) recorded hookworms (19.06 %) as predominant infection in the dogs of different parts of Himachal Pradesh, followed by *D. caninum* (16.01 %), *Taenia* spp. (8.47 %), *T. canis* (5.93 %) and *Trichuris* spp. (3.38 %). Such variation observed by Agnihotri et al. (2008) might be due to a variant target study group, which included dogs of higher age group as well and also topographical variations (different districts of Himachal Pradesh).

During the period of study (March 2010–February 2011), highest prevalence of GIT parasitism was recorded in summer season (37.87 %), followed by rainy season (26.15 %) and the lowest in the winter season (23.47 %). This observation might be due to whelping rhythm in dogs.

In the present study, highest prevalence of GI parasitism was observed in the pups, below 3 months of age (39.13 %), followed by the dogs with the age ranging from 3 months to 1 year (26.38 %) and lowest in dogs of the age ranging from 1 to 3 years (6.77 %). Ghosh et al. (2008) and Khante et al. (2009) also reported higher prevalence of GI parasites in pups as compared to adult dogs, in Kolkata and Nagpur, respectively, which were in close corroboration with this study. The predominant infection in pups (below 3 months age) was due to *T. canis* and hookworms because of the occurrence of both transplacental and transmammary

Table 2 Prevalence of gastrointestinal parasites on the basis of living styles

Seasons	Stray dogs		Pet dogs	
	Total samples examined	Positive samples	Total samples examined	Positive samples
Summer (March–June)	31	20 (64.51)	35	5 (14.28)
Rainy (July–October)	17	7 (41.17)	48	9 (18.75)
Winter (November–February)	26	8 (30.76)	89	19 (21.34)
Total	74	35 (47.29)	172	33 (19.19)

Values in parentheses depict the percentage

transmissions (Khante et al. 2009) as well as inverse age susceptibility to both the nematodes.

In the present study, 47.29 and 19.19 % prevalence were detected in stray and pet dogs, respectively, for one or the other GI parasite (Table 2). Higher infection in stray dogs was due to their higher density per unit area, malnutrition, adverse environmental conditions and lack of anthelmintic therapy (Borecka and Gawor 2000). The stray dogs showed higher prevalence in all the seasons as compared to pet dogs and hence could be held responsible for dissemination of infection to healthy stray dogs, pet dogs as well as to human beings. *T. canis*, hookworm and Taeniid eggs reported in the study hold significant zoonotic potential and hence their presence in the environment indicate serious threats to the individuals residing in periphery and especially to the children, who used to play with the infected pets.

Acknowledgments Authors are thankful to the Dean, Dr. G. C. Negi College of Veterinary and Animal Sciences for providing the necessary facilities for undertaking this investigation.

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