

Prevalence of Gastrointestinal Helminths of Dogs in Dschang, Cameroon

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ABSTRACT

Faecal samples from 131 household dogs were examined for gastrointestinal helminth parasites using the simple floatation method. 116 (88.5%) of the dogs were found infected with one or more of the following parasite species: *Toxocara canis*(34.35%), *Ancylostoma caninum* (73.28%), *Ancylostoma braziliense* (14.50%), *Uncinaria stenocephala*(26.72%), *Trichuris vulpis* (8.40%), *Capillaria aerophila*(3.82%), *Strongyloides stercoralis*(11.45%), *Dipylidium caninum*(6.11%), *Mesocostoides lineatus*(3.82) and *Taenia* spp.(1.53%). These parasites occurred either as single or multiple infections, the most prevalent being the double species infection (32.83%). The results of this study are of epidemiological importance in view of the role dogs play as reservoir or intermediate hosts to some parasites of man and other domestic animals.

Key words: Dogs, Gastrointestinal, Helminths, Parasites, Prevalence, Multiple infections, Cameroon.

RESUME

Les fèces de 131 chiens de domicile ont été examinés pour la recherche des helminthes parasites gastro-intestinaux. L'analyse parasitologique a été faite en utilisant la méthode de flottaison simple. 116 chiens soit 88.55% se sont révélés porteurs d'un ou plusieurs espèces parasites suivants : *Toxocara canis*(34.35%), *Ancylostoma caninum*(73.28%), *Ancylostoma braziliense*(14.50%), *Uncinaria stenocephala*(26.72%), *Trichuris vulpis*(8.40%), *Capillaria aerophila*(3.82%), *Strongyloides stercoralis*(11.45%), *Dipylidium caninum*(6.11%), *Mesocostoides lineatus*(3.82%) et *Taenia* spp.(1.53%). Les infestation parasitaires ont été uni ou multiples. Les plus fréquents ont été les infestation double(32.83%). Les résultats de ce travail ont une importance épidémiologique, vue le rôle que joue le chien en tant que réservoir ou hôte intermédiaire de certains parasites de l'homme et des animaux domestiques.

Mots clés : Chiens, Gastro-intestinaux, Helminthes, Parasites, Prévalent, Infestation multiple, Cameroun.

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INTRODUCTION

Poor management and irresponsible ownership of dogs have become a source of danger to the household and populace. These dogs could be infected with pathogens dangerous to man and other domestic animals. Gastrointestinal helminths are the most widespread of these pathogens (Mckenzie, 1977; Traub *et. al.* 2002) Dogs pollute the environment with eggs and larvae of *Ancylostoma* spp., *Toxocara canis*, *Dipylidium caninum*, *Taenia* spp. and other nematodes which also infect man and his domestic animals (Arambulo and Steele, 1976; Soulsby, 1983; Ajayi and Dublinsky,1997; Wiwanitkit and Waenlor, 2004). This is the first study on the prevalence of gastrointestinal helminths of dogs in Dschang, their effect on other domestic animals and humans.

MATERIALS AND METHODS

Faecal samples collected from 131 dogs were analysed using the floatation method described by Thienpont *et. al.* (1979), while the number of eggs per gram (epg) of faeces were determined using the McMaster egg count technique (Euzebly, 1981). The identification of ova of parasites was by morphological characteristics such as shape, size, nature of shell, number of blastomeres from ova, the use of plate keys (Thienpont *et. al.*, 1979; Marvin and Olsen, 1980; Euzebly, 1981; Soulsby, 1982). Whole worms preserved in 10% Formalin were cleared with lactophenol and identified using morphological characteristics which included kind of mouth parts, size and structure of anal region for nematodes and measurements of the gravid segments and the characteristic shape of the scolex for cestodes (Soulsby, 1982).

To verify differences in prevalence, the chi-square (X²) test was used.

RESULTS

Gastrointestinal helminths were recorded in 116 (88.5%) of the 131 dogs examined. A total of 10 species belonging to 9 genera were identified: *Toxocara canis* (34.35%), *Ancylostoma caninum* (73.28%), *Ancylostoma braziliense* (14.50%), *Uncinaria stenocephala* (26.72%), *Trichuris vulpis* (8.40%), *Capillaria aerophila* (3.82%), *Strongyloides stercoralis* (11.45%), *Dipylidium caninum* (6.11%), *Mesocestoides lineatus* (3.28%) and *Taenia* spp.(1.53%) (Table 1 and Fig 1).

Twenty nine point seven six percent of the overall infections occurred as single infections, leaving the remaining 58.76% as multiple infections with either two

Table 1: Species and incidences of gastrointestinal helminths of dogs in Dschang area Based on 131 faecal samples

Species	Number of dogs infected	Percentage positive
<i>Toxocara canis</i> ¹	45	34.35 ^a
<i>Ancylostoma caninum</i> ¹	96	73.28 ^b
<i>Uncinaria stenocephala</i>	35	14.50 ^c
<i>Trichuris vulpis</i> ¹	11	8.40 ^{cd}
<i>Capillaria aerophila</i>	5	3.82 ^{de}
<i>Strongyloides stercoralis</i> ¹	15	11.45 ^{cd}
<i>Dipylidium caninum</i> ¹	8	6.11 ^{cde}
<i>Mesocestoides lineatus</i>	5	3.28 ^{de}
<i>Taenia</i> spp	2	1.53 ^e
Overall infection	116	88.50

¹ Parasites of public health (zoonotic) importance
^{a, b, c, d, e, -} means significant differences.

or more species present. The most prevalent association was bi-specificity, with 32.83% of the animals having two species of intestinal helminths present in their faeces. The most common was the association between *Toxocara canis* and *Ancylostoma caninum*, having S10.69% prevalence. Three dogs were identified with five different species of helminths in their faeces. The

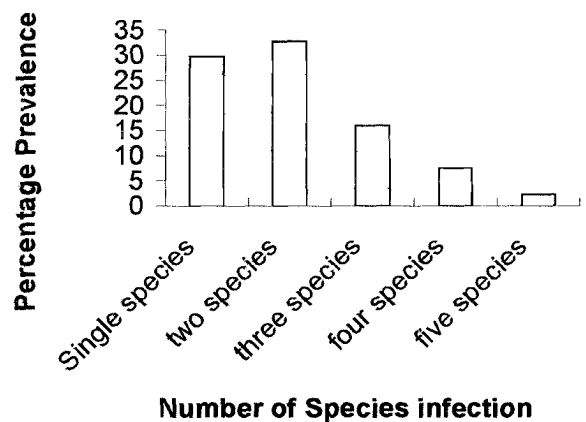


Figure 1. Prevalence of parasite association as determined by 131 faecal examinations in Dschang

Table 2: Mean intensity of infection expressed as mean egg per gram of faeces.

Parasite	Number of dogs infected	Mean \pm Standard Deviation
<i>Toxocara canis</i>	45(44)*	7158 \pm 14554
Hookworms	99	2126 \pm 3179
<i>Trichuris vulpis</i>	11	100 \pm 77
<i>Capillaria aerophila</i>	5	1110 \pm 1981
<i>Strongyloides stercoralis</i>	15	1487 \pm 1454
Tapeworms	15(2)*	2 \pm 12

* Represents dogs with eggs in their faeces.

combinations were as follows: *T. canis*, *A. caninum*, *A. braziliense*, *U. stenocephala* and *T. vulpis*; *A. caninum*, *U. stenocephala*, *T. vulpis*, *M. lineatus* and *Taenia* spp.; and *T. canis*, *A. caninum*, *A. braziliense*, *D. caninum* and *S. stercoralis*. Considering the different species, the difference was significant for various species ($p < 0.05$), as shown in table 1.

The mean faecal egg count for all infected dogs are recorded in table 2; this was used as a measurement of the intensity of infection. Hookworms, *T. canis* and *S. stercoralis* had high intensities, meaning that these parasites are present in large numbers in Dschang. This results agrees with that of Fashuyi(1981), who reported heavier infections of *A. caninum* and *T. canis* in local dogs.

DISCUSSION

Dschang, Cameroon, where this study was carried out, is noted for its high relative humidity and heavy rainfall. It is characterised by a long rainy season and a short dry season. These bio-climatic conditions are known to favour the development and transmission of helminth parasites (Ugochukwu and Ejimadu, 1985). This explains the high prevalence of helminth parasites recorded in this study. This high prevalence is also associated with the fact that most dogs in Dschang were observed to lead a semi - stray life, thus increasing their chances of exposure to infection. The inadequate sanitary facilities offered (to dogs) by most owners exposed them to infections, especially as dogs were observed to feed on vomitus and from garbage. Saror *et. al.* (1979), reported that dogs maintained under poor sanitary conditions are more easily infected as compared to those maintained under proper hygienic conditions. The heavy infection of *A. caninum*, *T. canis* and *S. stercoralis* in dogs in this area could be asso-

ciated with the humid weather conditions which are factors favourable to the pre- infective and infective stages of these parasites on the ground. The lack of proper care from dog owners could also lead to auto infection thus contributing to heavy infections with these parasites.

From the point of view of public health, the most important aspect of these results is that as many as 73.28% of the dogs examined were infected with *Angylostoma caninum*, a worm whose larvae cause lesions in man consisting of bullae with indurated edges which may burst and become secondarily infected. Also important is *T. canis*, which may also be involved in the petit mal-like convulsions, bronchitis and granulomatous lesions of the eye (Beaver, 1969). Other helminths such as *Strongyloides stercoralis* and *D. caninum* observed in this study are known to infect humans (Soulsby, 1983), thus a further potentially important human infection from dogs in the area. Some of the dogs could be a source of infection with *Taenia ovis* for sheep and *Taenia hydatigena* for ruminants in the area.

Although not recorded in the present study, *Echinococcus granulosus*, which also occurs in Dschang (Zoli, pers. Comm.), constitutes an occasional hazard to man and some of his domestic animals.

CONCLUSIONS

The dog helminth parasites in this area where basic veterinary and public health care is limited are of epidemiological importance in view of the role dogs' play as reservoir or intermediate hosts for such uncommon human parasites. Children are at high risk because of their exposure to the environment, puppies and to out-door playgrounds that constitute an ideal dog toilet and *Toxocara* embryonation site (Schmidt and Roberts, 1981; Minnar and Krecek, 2001).

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