

A SURVEY OF PATENT GASTROINTESTINAL PARASITES OF STRAY DOGS IN BULAWAYO URBAN AREA

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Summary

A total of 71 stray dogs from Bulawayo urban area was examined for gastrointestinal parasites by the modified formol-ether and Ziehl-Nielsen techniques. Cysts/ova of eight gastrointestinal parasite species were observed. The most prevalent parasite species was *Ancylostoma* (38.0%) and the least was *Toxascaris leonina* (1.4%). Other parasites observed were *Toxocara canis* (7.0%), *Spirocerca lupi* (11.3%), *Dipylidium caninum* (7.0%), *Taenia* spp (2.8%), *Giardia* (14.1%) and *Cryptosporidium* (21.1%). A high percentage of dogs over 25 months old was infected by more than one species of parasites. Protozoons of the genus *Giardia* and *Cryptosporidium* are reported in dogs for the first time in Zimbabwe.

Introduction

The pattern of dog-keeping in most parts of Africa is that of allowing dogs to roam around with uncontrolled breeding and poor veterinary care (Hayles *et al.*, 1977). The majority of these stray dogs have access to the outdoor environment and are likely to be exposed frequently to gastrointestinal parasites. While the well-kept dogs are controlled in their movements, stray dogs live an independent existence and many scavenge and sometimes hunt and eat the invertebrates and rodents that might act as intermediate or transport hosts for some gastro-intestinal parasites.

Although studies have been done on endoparasites of dogs in Zimbabwe (Rogers and Obwolo, 1988; Obwolo *et al.*, 1991) these were limited to specific parasite species, and no information has yet been documented on the complete spectrum of gastrointestinal parasites of stray dogs in an urban area in Zimbabwe. The objective of this study is to give information on the prevalence of patent gastrointestinal parasites of stray dogs in Bulawayo urban area.

Materials and Methods

A total of 71 stray dogs impounded within the confines of the Bulawayo urban area by the Society for Prevention of Cruelty to Animals (S.P.C.A.) was

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blood were represented and each dog was identified by its cage number. History of the dogs showed no records of treatment against gastrointestinal parasites whilst on the S.P.C.A. premises at the time of sampling.

In large dogs an index finger covered with a finger stall was inserted into the rectum and faeces removed directly whilst in young dogs whose anal size did not allow easy digital removal of faeces, freshly-voided faeces were collected into individually labelled plastic containers. More than 1g of faeces was obtained from each case and preserved with 5ml of 10% formalin. Each sample was subjected to parasitological examination within 48 hours from the day of collection.

The parasitological methods used to determine the presence of endoparasite infection in dogs were the modified *Ziehl-Nielsen* technique for detection of *Cryptosporidium* oocysts (Cheesebrough, 1991) and the modified formol-ether concentration technique for detection of helminth ova and *Giardia* cysts (Fleck and Moody, 1988).

For the recovery and identification of *Cryptosporidium* oocysts, stools were smeared on glass slides and allowed to dry for one hour. Five percent sulphuric acid was poured on the smears and left for 30 minutes and then followed by methylene blue (0.3%) as counterstain before the slides were examined under the microscope. Specimens were considered to be positive for *Cryptosporidium* oocysts when the observed cyst contained a round, thick wall with various inner structures comprising up to four sporozoites each having densely stained red bodies 3–5 μ m in diameter on a blue background.

The descriptions given by Soulsby (1968) were used to identify the helminth ova. The presence of one or more ova/cysts of a given parasite from an individual sample was considered as infected with that parasite and the intensity of infection was not taken into consideration. Prevalence of each parasite species was calculated as the number of infected cases out of the total number of cases examined by age groups.

Results

Table 1 shows the patent parasite species and the parasites with a zoonotic potential. The table also shows the prevalence of parasite burden per age category.

Ancylostoma was the most prevalent parasite (38%), followed by *Cryptosporidium* present in 21.1% of the specimens. The least prevalent parasite was *Toxascaris leonina* which was found in the faeces of a single puppy in the age category of 1–4 months. The overall prevalence of *Taenia* spp was 2.8%.

The percentage prevalences of dogs affected by each species and by more than one parasite species are shown in Figure 1 and Figure 2 respectively. More than 40% of the dogs ranging from 13–24 months of age had more than one parasite species while more than 50% of dogs over the age of 25 months carried a parasite burden of more than one species.

Table 1: Gastrointestinal Parasites of 71 Urban Stray Dogs in Zimbabwe.

<i>Estimated age (months)</i>	1-4	5-8	9-12	13-24	25+	<i>Total (%+ve)</i>
<i>No. of dogs examined</i>	9	8	14	16	24	
<i>Giardia*</i>	1	0	3	3	3	10 (14.1)
<i>Cryptosporidium*</i>	2	0	3	3	6	15 (21.1)
<i>Ancylostoma*</i>	2	4	5	8	8	27 (38.0)
<i>Spirocerca lupi</i>	1	0	2	4	1	8 (11.3)
<i>Toxocara canis*</i>	0	1	1	2	1	5 (7.0)
<i>Toxascaris leonina</i>	1	0	0	0	0	1 (1.4)
<i>Taenia spp*</i>	0	0	0	1	1	2 (2.8)
<i>Dipylidium caninum*</i>	0	1	1	1	2	5 (7.0)

* Parasites with zoonotic potential.

Six genera (*Ancylostomum*, *Taenia*, *Dipylidium*, *Toxocara*, *Cryptosporidium* and *Giardia*) observed in samples are known to be of public health importance.

Discussion

The observed rates of infection with patent gastrointestinal parasites in urban stray dogs indicates that they are frequently exposed to a wide range of gastrointestinal parasites.

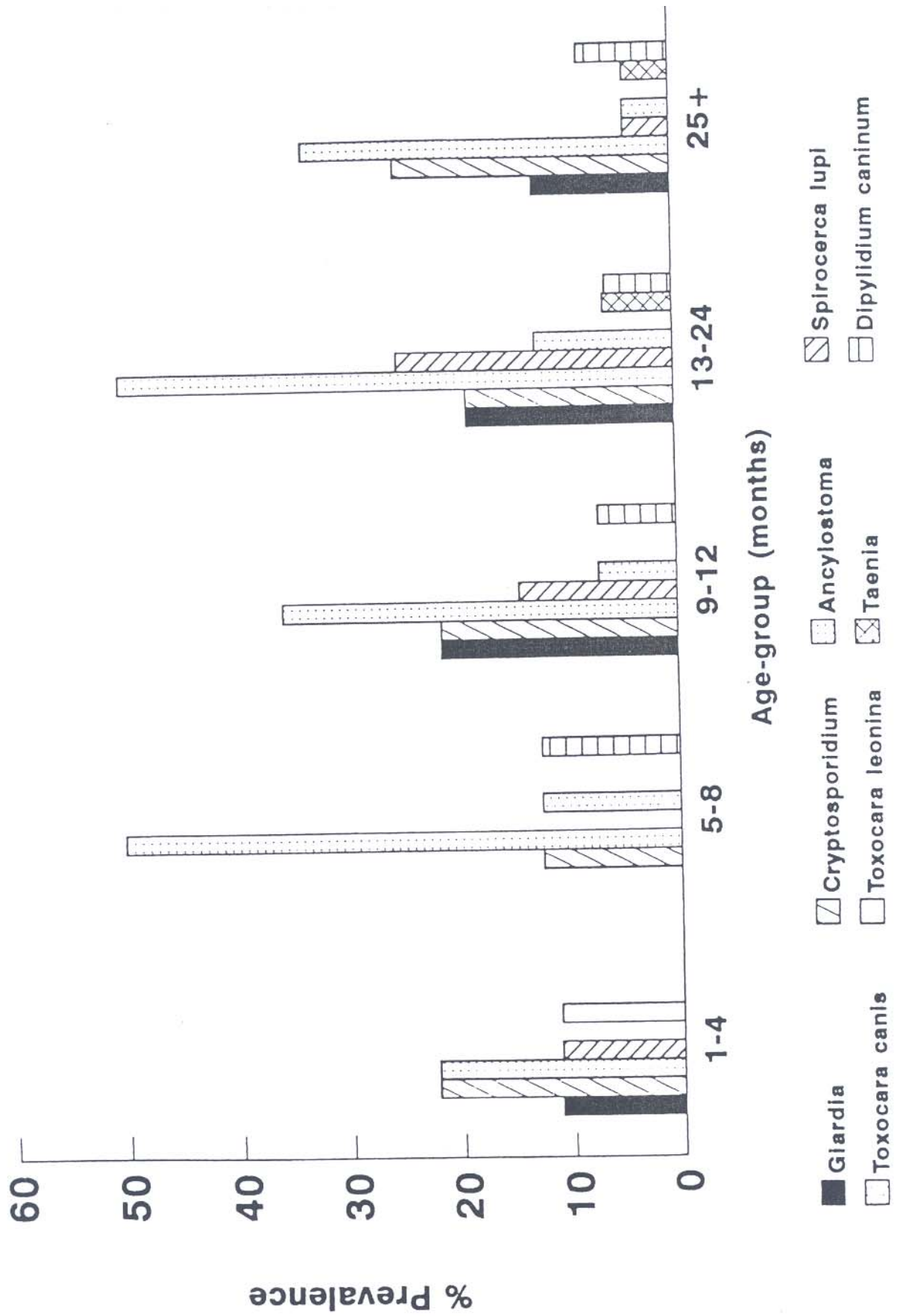
An interesting feature in the study was the high prevalence of *Ancylostoma* spp infection, which on its own can be fatal, but the dogs appeared symptomless at the time of collecting samples. Our results agree with the findings of Obwolo *et al.* (1991) who, in spite of finding 100% prevalence of *Ancylostoma*, reported no clinical signs associated with the infection, and partially with Turner (1977), who did not find any clinical signs in infected adult stray dogs, although infected young puppies had clinical signs compatible with hookworm infection.

The overall percentage distribution of *T. canis* and *T. leonina* is much lower than the figures recorded by Woodruff (1970) and Le Riche and Sewell (1978) in similar surveys in stray dogs in the United Kingdom, but this might be due to our small sample size.

The prevalence of *S. lupi* (11.1%) was lower than that of Obwolo *et al.* (1991) (47.6%). A possible reason for their high prevalence is that their study was carried out in communal area dogs living in an environment with high exposure to the intermediate host.

Presence of *Cryptosporidium* and *Giardia* in dogs has not been previously reported in Zimbabwe. Surveys in other countries have shown that infection with *Giardia* is common and widespread in dogs (Barlough, 1979), although prevalence rates vary greatly because of differences in the type of population surveyed and the diagnostic procedures employed. Swan and Thompson (1986) found an

Gastro-intestinal parasite of urban stray dogs in Zimbabwe



Gastro-intestinal parasites of urban stray dogs in Zimbabwe

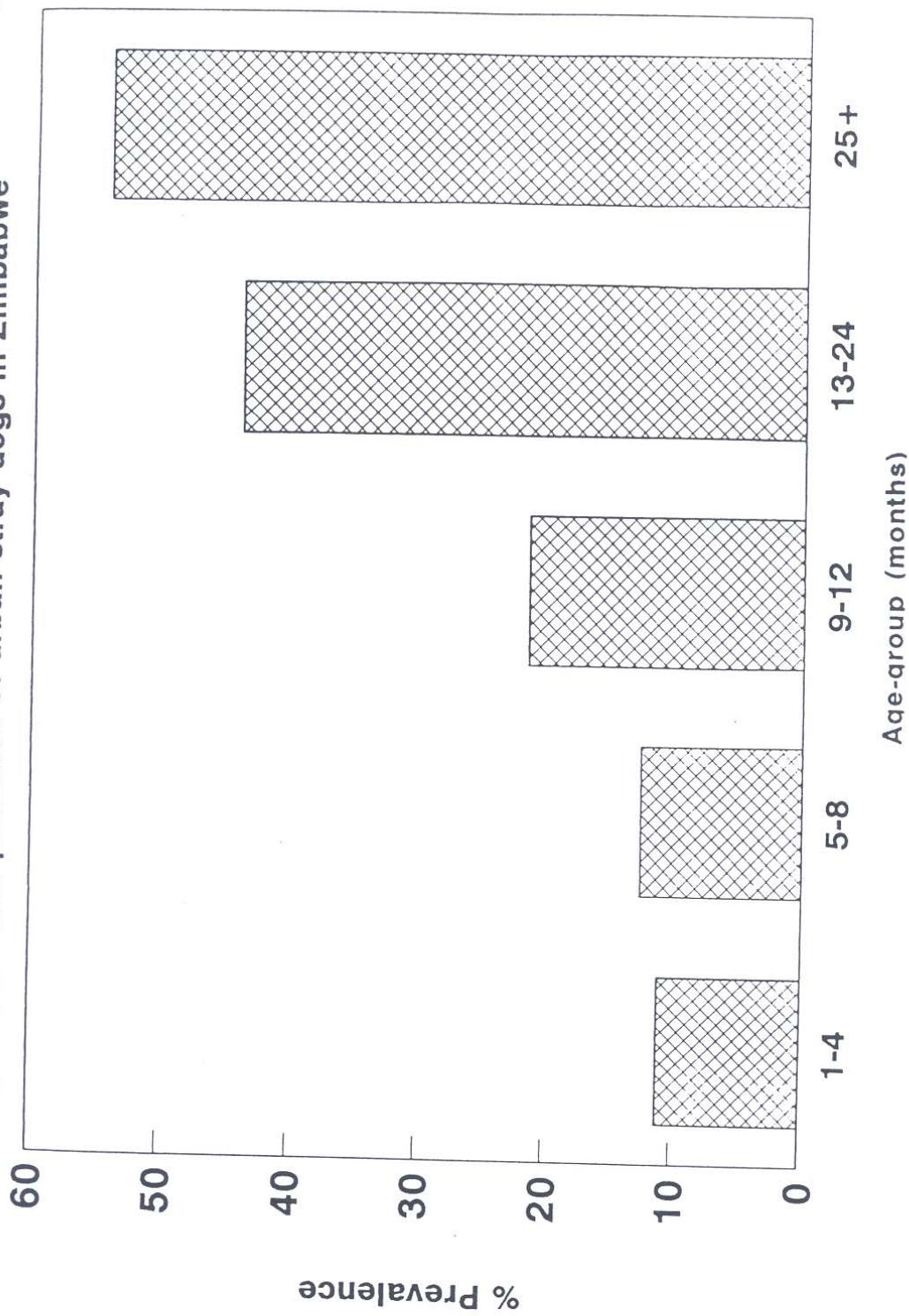


Fig. 2: Dogs infected (> 1 parasite spp.)

overall prevalence of *Giardia* infection in dogs of 21%, with fewer pet dogs being infected than strays. Our prevalence was lower (14.1%), even though we used a very sensitive technique for diagnosis. The prevalence might have been higher if we had taken more than one faecal sample from each animal, as an erratic pattern of cyst excretion has been demonstrated in dogs (Merritt, 1980) and mice (Grant and Woo, 1979).

At least four of the helminth genera found to be present in this study (*Ancylostoma*, *Toxocara*, *Taenia* and *Dipylidium*) are proven zoonotic agents (Gualazzi *et al.*, 1986). *Toxocara canis* is of particular importance, causing visceral and ocular larva migrans especially in children. The evidence for *Giardia* and *Cryptosporidium* as zoonoses has been reviewed by Faubert (1968) and Soave and Johnson (1988) respectively.

Results obtained from this survey, particularly those relating to zoonotic parasites, would seem to advocate that an extensive study is needed on the gastrointestinal parasites of stray dogs in major cities in Zimbabwe, with special reference to the zoonotic parasites.

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