

Prevalence of Gastrointestinal Helminthes and Protozoa among Stray Dogs in Baghdad

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Summary

The aim of this study is to identify the gastrointestinal parasites and Protozoa in stray dogs. The current study include seven genera of intestinal helminthes and protozoa as follows: one cestode (*Taenia sp.* 29.1%), four nematode (Hookworm 86.6%, *Toxocara canis* 67.5%, *Trichuris vulpis* 51.6% and *Strongyloides sp.* 5%) and two protozoa (*Gairdia sp.* 24.1% and *Cryptosporidium sp.* 20.8%) from 120 fecal samples of dogs were collected from different regions of Baghdad during the period from February to July 2014. The results revealed that the intestinal parasites appeared in all months of study; however, the high rates of infection was during winter months.

Keywords: Stray dogs, Intestinal parasites, Helminthes, Protozoa, *Cryptosporidium*, *Giardia*, *Strongyloides*, *Taenia*.

Introduction

Dogs play an important role as intermediate, definitive and reservoir hosts for a variety of intestinal parasites, some of parasites cause zoonotic diseases that pose significant economic and public health problems in many parts of the world (1). The transmission of zoonotic agents could be through direct contact with the animal or indirect as in contact with animal secretions and excretion, infected water and food (2). Dogs are the definitive hosts to a number of helminthes, which can result in significant health problems as well as financial losses globally (3). These zoonotic parasites were significant to public health especially in developing countries and communities that may be socioeconomically challenged (4). The aim of current study is the identification of gastrointestinal parasites and protozoa in dogs.

Materials and Methods

This study was conducted in Baghdad province- capital of Iraq. A total of 120 fecal samples from stray dogs were collected to investigate gastrointestinal parasites and protozoa in Baghdad from February to July 2014, (20 samples/ month). All fecal samples were examined by the following steps: Wet direct film, potassium dichromate $K_2Cr_2O_4$ film, the formalin-ether sedimentation method, smears of the sediment were made and stained by the modified Ziehl-Neelsen stain to show

Cryptosporidium oocysts. Flotation technique in saturated sodium chloride solution (5), measurements and color photographs of eggs, cysts and oocysts were taken using Ocular micrometer calibration (6). Diagnosis of parasites at Natural History Research Center and Museum, was done according to the researches (7 and 8).

Results and Discussion

A total of 120 fecal samples from stray dogs revealed seven genera of intestinal parasites and protozoa (Table, 1).

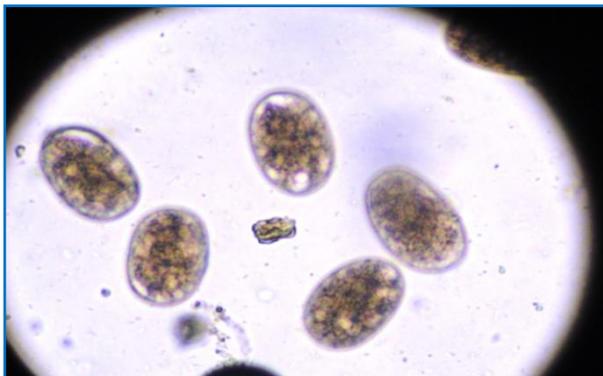
Table, 1: prevalence of intestinal parasites and protozoa in 120 fecal samples of dogs.

Species of parasites	Form	No. of infected samples	%
<i>Taenia sp.</i>	Egg	35	29.1
<i>Toxocara canis</i>	Egg	81	67.5
Hookworm	Egg	104	86.6
<i>Trichuris vulpis</i>	Egg	62	51.6
<i>Strongyloides sp.</i>	Egg	6	5
<i>Giardia sp.</i>	Cyst	29	24.1
<i>Cryptosporidium sp.</i>	oocyst	25	20.8

Dogs harbored many pathogens including intestinal helminthes and protozoa (9). A single stray dog may harbor 10000 worms (10). The current study revealed high rate 86.6% of Hookworm infection that include two genus *Ancylostoma* and *Uncinaria* (Fig. a and b); both of them were recorded for first time in Iraq by (11 and 12). This high rate of infection disagrees with (13) who recorded a

low rate 2% in Kalar city province of Sulaimani. The variation may be due to differences in temperatures and moistures between Baghdad and Sulaimani.

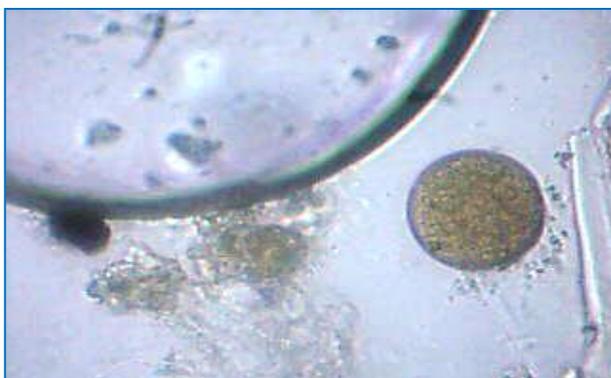
Toxocara canis (Fig. c) was recorded in Iraq, 1957 (14). However, this study recorded a high rate 67.5% that mean the infection still epizootic and may be transmitted to man especially children. That proved recently by serological survey (a commercial ELISA test), the rate of Toxocariasis in sick children was 30.8% and in healthy children 12% in Mosul province (15).



Figure, a: *Ancylostoma* sp. egg in stray dogs.



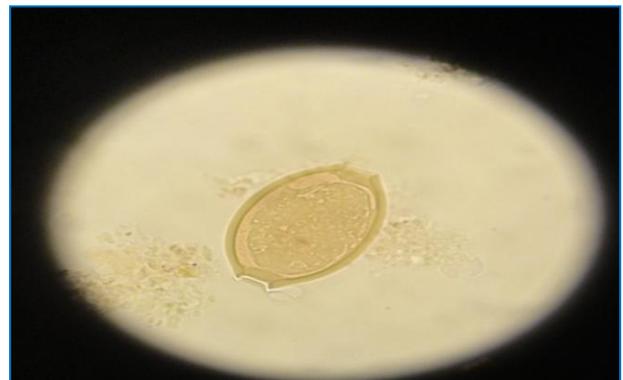
Figure, b: *Uncinaria* sp. egg in stray dogs.



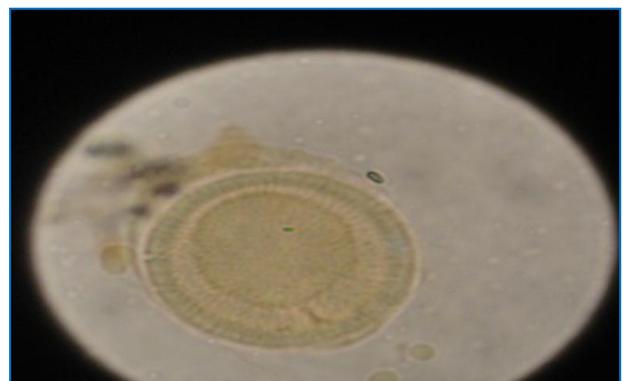
Figure, c: *Toxocara canis* egg in stray dogs.

The canine intestinal whipworm, *Trichuris vulpis*, (Fig. d) is the most common and well

known in veterinary practice, due to their morphological features of the eggs; the first recorded of *Trichuris vulpis* in Iraq (14) and there are no other records in Iraq in current study. *Trichuris vulpis* appeared 51.6% that high rate as compared with (16) who recorded 25.7% in Kuala Lumpur City, Malaysia. The difference between rates is due to the different of temperatures and moisture between the studied regions. The dogs are a reservoir for many species of *Taenia* (Fig. e), so the rates of infection may be different between the provinces. The current study revealed 29.1% while (13) recorded high rate 78%. *Strongyloides* sp. (Fig. f) was 5% in current study which is similar to (12).



Figure, d: *Trichuris vulpis* egg in stray dogs.

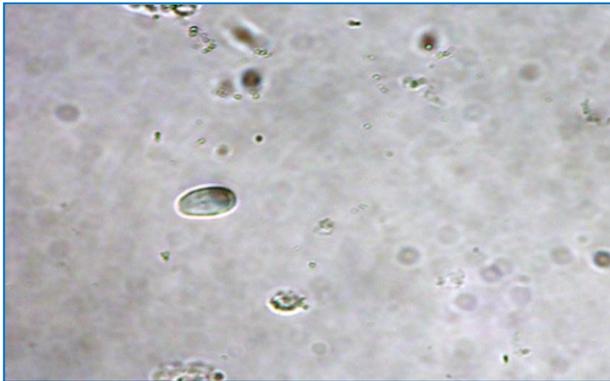


Figure, e: *Taenia* sp. egg in stray dogs.

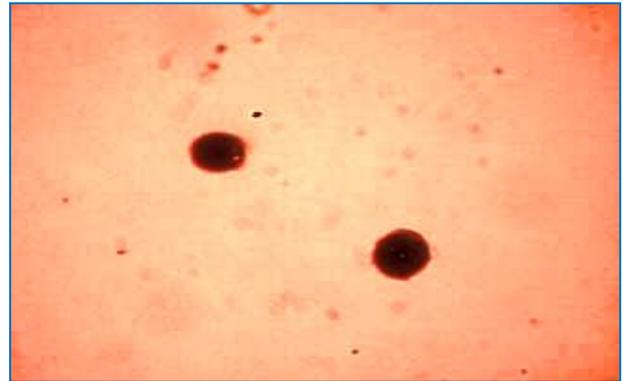


Figure, f: *Strongyloides* sp. egg in stray dogs.

The results showed two species of protozoa first *Giardia* sp. (Fig. g) 24% which is similar to (17), second *Cryptosporidium* sp. (Fig. h) 20.8% that is less than that by authors (18) who recorded 42% in Mosul province. That difference may be due to the ages of the animals examined that *Cryptosporidium* increased more in young animals than in old due to less immunity in puppies.



Figure, g: *Giardia* sp. cyst in stray dogs.



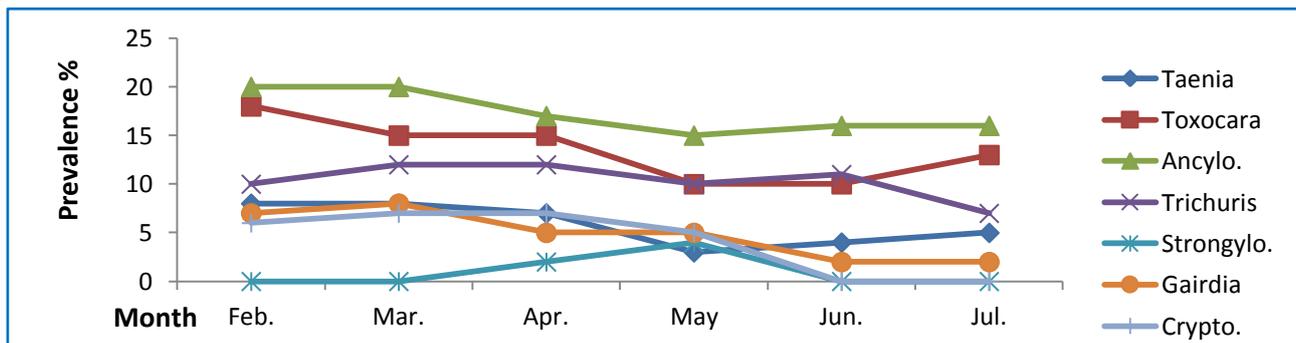
Figure, h: *Cryptosporidium* sp. oocyst in stray dogs.

The results revealed significant differences among the months of study (Table, 2 and Fig. 1).

All studied months appeared presence of intestinal parasites. However, February and March appeared the high rates of infection that is similar to (19) who also recorded a high percentage infection during winter months.

Table, 2: Prevalence of intestinal parasites and protozoa during months of study.

Months	No. of samples	<i>Taenia</i> sp. %	<i>Toxocara</i> sp. %	<i>Ancylostoma</i> sp. %	<i>Trichuris</i> sp. %	<i>Strongyloides</i> sp. %	<i>Giardia</i> sp. %	<i>Cryptosporidium</i> sp. %
February	20	8(40)	18(90)	20(100)	10(50)	-	7(35)	6(30)
March	20	8(40)	15(75)	20(100)	12(60)	-	8(40)	7(35)
April	20	7(35)	15(75)	17(85)	12(60)	2(10)	5(25)	7(35)
May	20	3(15)	10(50)	15(75)	10(50)	4(20)	5(25)	5(25)
June	20	4(20)	10(50)	16(80)	11(55)	-	2(10)	-
July	20	5(25)	13(65)	16(80)	7(35)	-	2(10)	-



Figure, 1: Significant differences among the parasites during months of study.

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انتشار الديدان والأوالي المعوية بين الكلاب السائبة في بغداد

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الخلاصة

هدفت الدراسة للتعرف على أنواع الطفيليات المعوية والأوالي للكلاب السائبة. أظهرت الدراسة الحالية سبعة أجناس وأنواع من الديدان والأوالي المعوية بين الكلاب السائبة وكالاتي: دودة شريطية واحدة (التينيا 29.1%) واربعة ديدان اسطوانية (الدودة الشصية 86.6% والتوكسوكارا 67.5% وترايكورس فلبس 51.5% وسترونجلوس 5%) واثنان من الأوالي (الجيارديا 24.1% والكريتوسبورديوم 20.8%) وذلك نتيجة لفحص 120 عينة براز من الكلاب، جمعت من مناطق مختلفة من بغداد ولمدة من شهر شباط إلى نهاية شهر تموز 2014. سجلت كل اشهر الدراسة نسب اصابة بالطفيليات المعوية وأظهرت اشهر الشتاء اعلى النسب.

الكلمات المفتاحية: الكلاب السائبة، الطفيليات المعوية، الديدان، الأوالي، الكريتوسبورديوم، الجيارديا، سترونجلوس، التينيا.