

Stray Dogs Internal Parasites from Baquba City , Diyala Province, Iraq

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Summary

The survey was done in order to investigate the prevalence of internal parasites in the intestines of dogs in Diyala province during the period from February to April 2013. A total of 30 stray dog's fecal samples from 5 different areas in Diyala province were collected ; examined by the flotation technique , sedimentation technique and direct smear .The total prevalence was 16.66% .The parasites eggs isolated were *Dipylidium caninum* , *Toxocara spp.* , *Isospora spp.* , *Taenia spp.* , *Mesocostoides spp.* and *Echinococcus spp.* with different percentages. Proportion of infection was higher in young dogs $6 \geq$ months old 13.33% , than older dogs those of $12 \geq$ months old 3.33%.

Introduction

Canine parasites exist internally and externally, Many are species specific and exist only on the dog, Intestinal parasitism exists in all ages of dogs with the greatest frequency in puppies, Types and incidence of parasitism varies with geographic regions, Additionally, age and immune status are significant factors influencing gastrointestinal (GI) parasitism (Seah *et al.*, 1975) .

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 mortality in dogs (Beaver *et al.*, 1984 ; Bowman 2009) .

Dogs are the definitive hosts to a number of helminthes, which can result in significant health problems as well as financial problems efficiency losses globally (Dalimi and Mobedi 1992) . More importantly, some dog general ill-health, In dogs gastrointestinal helminthes exert serious problems resulting in lowered resistance to infectious disease, retarded growth, reduced work efficiency and general ill-health. Intestinal parasites in dogs may result in clinical signs such as vomiting, diarrhea, anemia , anorexia, dermatitis and loss of condition (Urquhart *et al.*, 1996) .

Dipylidium caninum and *Taenia pisiformis* are the common tapeworms of dogs, They are passed to the dog by ingestion of the intermediate host of the tapeworm, The flea is the intermediate host of *Dipylidium* and rabbits and rodents are the intermediate host for *Taenia*, Dogs ingest the intermediate host and release the intermediate stage of the tapeworm into the GI of the final canine host where the parasite matures to an adult in the small bowel (Beugnet *et al.*, 2000) .

The importance of Taeniidae specifically *Echinococcus* in human 'Human alveolar echinococcosis' (AE), a hepatic disorder that resembles liver cancer, is a highly aggressive and lethal zoonotic infection caused by the larval stage of the fox tapeworm and on the other hand Young children are mostly at risk of acquiring the infection due to their close association with dogs and cats. The two major species of medical and public health importance are *Echinococcus granulosus* and *Echinococcus multilocularis*, which cause cystic Echinococcosis (CE) and alveolar Echinococcosis (AE), respectively. Human hydatid cyst is the most common presentation and probably accounts for more than 95% of the estimated 3 million global cases. Human AE causes approximately 0.3–0.5 million cases (all in the Northern Hemisphere) annually (Zhang *et al.*, 2008) .

Dipylidiasis is a zoonotic parasitic infestation caused by the dog tapeworm *Dipylidium caninum*. We report a rare case of *Dipylidium caninum* infection in a 4 year old male child (Narasimham *et al.*, 2013) ; Evidence suggests that this infection is more prevalent than the few published reports indicate. Human dipylidiasis (dog tapeworm infection) in the United States (Jerold 1962) .

Toxocariasis results from zoonotic transmission of the roundworms, *Toxocara canis* and *T. cati* from dogs and cats, respectively. Infection occurs when humans accidentally ingest the microscopic, oval and thick-shelled- embryonated eggs (shed in dog and cat feces) containing *Toxocara* larvae by hand-to-mouth contact. Children are particularly prone to infection because they are exposed to the eggs on sandboxes and playgrounds contaminated with dog and cat feces.. There are two “classical” clinical syndromes resulting from infection (Despommier 2003; Sharghi *et al.*, 2000) . Visceral larva migrans occurs most commonly in young children and results in hepatitis and pneumonitis as the larvae migrate through the liver and lungs, respectively. The full clinical presentation of toxocariasis includes hepatomegaly and pulmonary infiltrates or nodules accompanied by cough, wheezing, eosinophilia, lymphadenopathy, and fever. Larval entry into the central nervous system can also result in meningoencephalitis and cerebritis manifesting as seizures (Hotez 1993 ; Marx *et al.*, 2007) . Ocular larva migrans occurs more frequently in older children and adolescents and may result from the migration

of even a single larva in the eye. The resulting inflammation presents clinically as either a granuloma or a granulomatous larval track in the retina or as a condition of the vitreous that resembles endophthalmitis (Stewart *et al.*, 2005 ; Good *et al.*, 2004) . Neither visceral larva migrans nor ocular larva migrans are considered common conditions, although the incidence of the former has not been determined and it has been estimated at just under 1 per 10,000 annually for the ocular form (Good *et al.*, 2004) .

Strongyloides is a genus containing some 50 species of obligate gastrointestinal parasites of vertebrates (Speare 1989) . Intestinal threadworm *Strongyloides stercoralis* is a parasite of dog, cat and primates that occurs worldwide being most prevalent in tropical and subtropical countries. *Strongyloides* species of veterinary importance include a species infecting horse (*S. westerii*), cattle (*S. papillosus*) and swine (*S. ransomi*). These parasites are pathogens for young animals. In light infections, animals show no clinical signs. *Strongyloides stercoralis* infection in a Finnish kennel (Kati *et al.*, 2007) .

Though the complete life cycle of Mesocestoides spp. is not well known, it appears to require two intermediate hosts. The first being oribatid mites, and the second being certain amphibians, reptiles or small mammals who carry the invasive larval stage (tetrathyridium) mainly in the liver (Eguí'a-Aguilara *et al.*, 2005) .

Materials and Methods

Fecal samples were calculated from 30 dogs of both sexes , the ages of 11 dogs are ≥ 6 months old and the remaining 19 dogs are ≥ 12 months old . Fecal samples were collected directly from rectum of dogs with the help of finger using plastic gloves and putting in the formaldehyde (10%) and stored refrigerated , Direct smear method , sedimentation method and salt floatation technique (Urquhart *et al.*, 1996 ; Zeibig 1997) .

Results

A total of 30 dogs of both sexes from different areas at ages ≥ 6 -12 months years old were examined showed the following results in the table (1) :

Table (1) show no. of dogs examined , positive cases , areas ages.

Area	No.Dogs examined	No.positive	
		≥ 6 mon.	≥ 12 mon.
Khalis	4	1	0
Baladruz	8	0	1
Baquba	7	2	0
Kanaan	5	0	0
Bany Saad	6	1	0

5 dogs were found infected with total prevalence of 16.66%., Proportion of infection is more in young dogs ≥ 6 months old 13.33% ,than older dogs those of ≥ 12 months old 3.33%, table (1) .

From 5 areas of the Diyala province , Baquba city was highly infected 6.66%with the dogs parasites ,table (1).

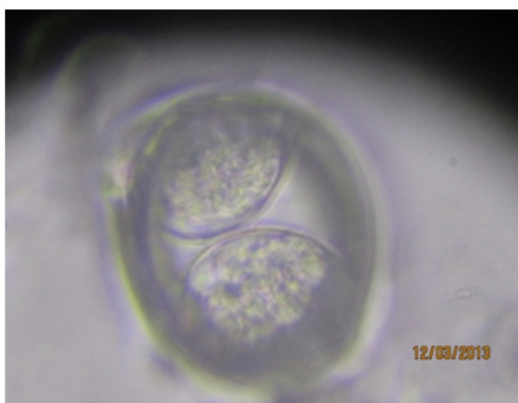


Fig.(2) *Isospra* spp.egg.

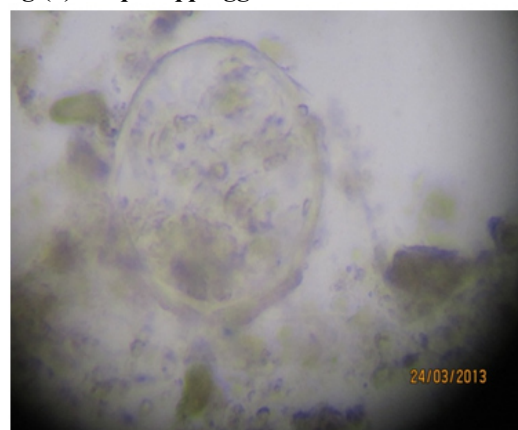
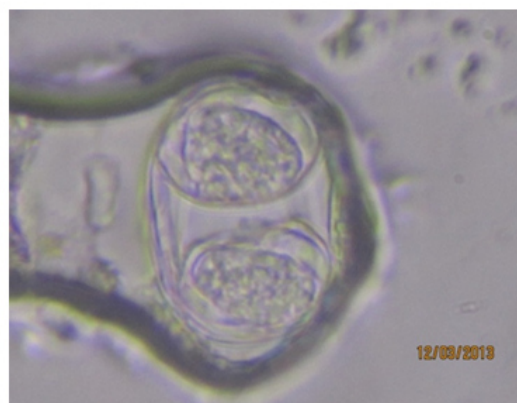


Fig.(3) *Dipylidium caninum* egg.

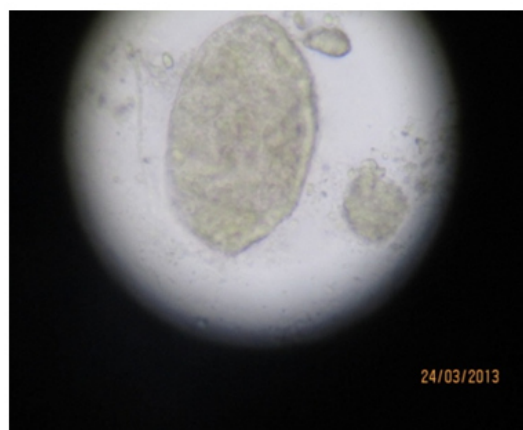


Fig. (4) *Mesocestoides* spp.egg

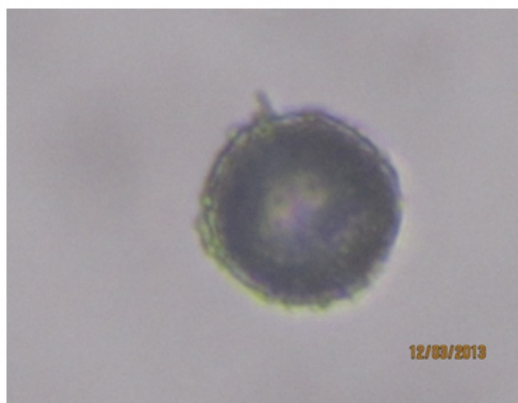


Fig.(1) *Toxocara* spp. Egg

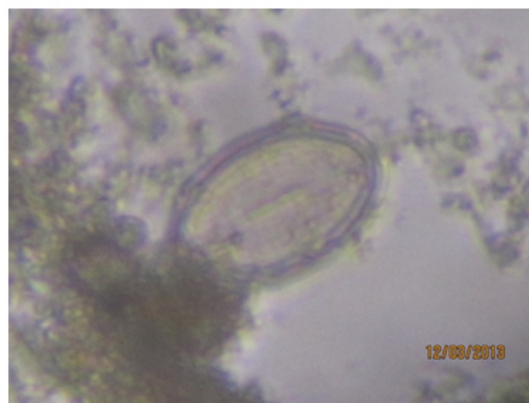


Fig.(5) *Strongyloides* spp. egg.

Diagnosis of eggs parasites were comprises following species , *Toxocara* spp. Fig.(1), *Isospra* spp. Fig.(2) , *Dipylidium caninum* Fig.(3), *Mesocestoides* spp. Fig.(4) , *Strongyloides stercoralis* Fig.(5) *Taenia* spp. and *Echinococcus* spp.

The no. and % of dogs infected with various parasites as revealed in table (2) , showed that *Dipylidium caninum* had the highest prevelance 30.8%.

Table (2) shows the no. and % of dogs infected with various parasites.

No. of infected dogs	parasites eggs spices	%
4	<i>Dipylidium caninum</i>	28.6%
3	<i>Toxocara spp.</i>	21.4%
1	<i>Taenia spp.</i>	7.1%
1	<i>Echinococcus spp.</i>	7.1%
3	<i>Isospora spp.</i>	21.4%
1	<i>Mesocestoides spp.</i>	7.1%
1	<i>Strongyloides spp.</i>	7.1%

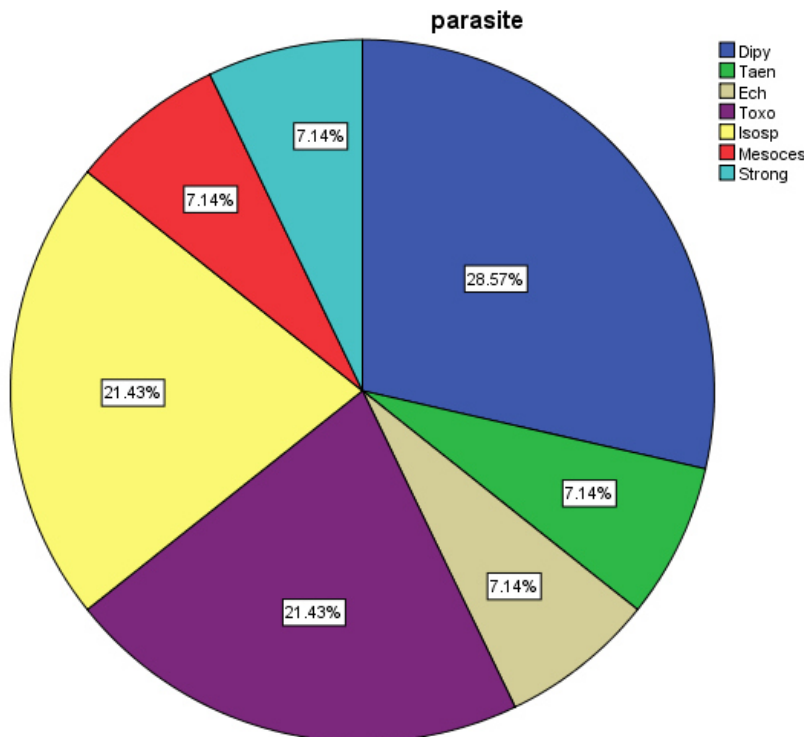


Fig. (6): shows the no. and % of dogs infected with various parasites.

Discussion

Mixed dog parasitic infection 100% up to 3 parasites was noticed in our study for the 5 positive cases, this result agree with findings of Eslami et al.,(2010) who revealed that , Mixed infection was the rule and 40 dogs (80%) harbored more than one species of helminth ; but disagreed with Ho et al.,(2006) who found , Of the 63 infected dogs, 11 were found to have a mixed infection of two different species of parasites; And with Rodríguez-Vivas et al., (2011) ⁽²²⁾ who found Mixed infection caused by two or three zoonotic parasites were discovered in 21.3% (30/130) and 3.1% (4/130), respectively.

No. of *Dipylidium caninum* were found in 4 out of 5 mixed infection positive cases (28.6%) , this high prevalence probably because of the wide spread of the intermediate host dog Fleas.

Taenia spp. , *Echinococcus spp.* and *Mesocestoides spp.* ,were found in 1 out of 5 positive cases with 7.1% prevalences for each parasite , the causes may be , for *Taenia spp.* low prevalence probably due to lack of different species of the intermediate host for this parasite; And according to *Echinococcus spp.* low prevalence may be due to that dogs are seldom found sheep carcasses can feed on, that considers as intermediate host.

Toxocara spp. were found in 3 out of 5 positive cases (21.4%) from the population of internal parasite in dog intestine of Diyala province due to the close breeding of dogs and may be to trans placental and trans mammary from mother.

According to high prevalence *Isospora spp.* organisms(coccidia), may be due to that the puppy is frequently exposed to its mother's feces and if the mother is shedding the infective cysts in her feces then the young animals will likely ingest them and coccidia will develop within their intestines ; therefore, *isospora* found in 21.4 % and more in puppies \geq 6 months of age than older dogs.

Our results concerning, *Toxocara spp.* and *Dipylidium caninum* agree with results of Tarish et al.,(1986) in Baghdad for the high prevalence of *Dipylidium caninum* and *Toxocara spp.* and for low prevalence of *Mesocestoides spp.* and *Strongyloides spp.* ; but disagree with same author Tarish et al.,(1986) by

the low prevalence of our finding for *Taenia spp.*, and *Echinococcus spp.* This could be to geographical, climatic, host - parasite relationship beside those probably certain specific causes explained for each parasite above.

The most parasite eggs are difficult to diagnosed in this study and might be agreed with Jahangir et al., (2013), Who stated that, Most cestode's eggs are similar; therefore, genus and species of the parasites could not be diagnosed by studying on feces of dogs.

Conclusion

1. The presence of zoonotic intestinal parasites such as *Toxocara spp.* and *Taenia/Echinococcus spp.* indicates the need for control programs to minimize the risk of transmission of zoonotic disease, particularly Cystic Echinococcosis, Alveolar Echinococcosis, Visceral Larva Migrans, and Ocular Larva Migrans to people living in these areas of Diyala Province.
2. More investigations research needs for scan canine, feline zoonotic parasitic infections in Diyala Province.

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" عزل الطفيليات الداخلية من الكلاب السانبة في مدينة بعقوبة , محافظة ديالى "

أ.م.د. رعد حمودي حسون
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الخلاصة:

أجريت الدراسة لغرض التحقق من انتشار الطفيليات أداخليه في أمعاء الكلاب في محافظة ديالى خلال الفترة الواقعة من من شباط ولغاية أبريل 30 عينة براز جُمعت من الكلاب السانبه من مناطق مختلفة في محافظة ديالى , وأجريت عليها اختبارات التطويق , الترسيب . لسنة 2013 سجلت نسبة الانتشار الكلية للطفيليات 16.6%. والفحص المباشر بالمجهر .
Taenia spp. , *Isospora spp.* , *Dipylidium caninum* , *Toxocara spp.* , شخصت بيوض الطفيليات للأنواع مختلفة. بنسب كانت نسبة *Echinococcus spp.*
% انتشار العدوى في الكلاب الصغيرة بعمر (≥ 6 أشهر) 13.33 % أكثر من الكلاب الكبيرة بعمر (≥ 12 شهر) والتي نسبتها حوالي 3.33 .

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