

DISTRIBUTION OF *CRYPTOSPORIDIUM SPP* INFECTION IN WILD PIGEONS IN BAGHDAD CITY -IRAQ

Azhar A.Faraj

Department of parasitology, College of Veterinary Medicine, University of Baghdad, Baghdad,Iraq.

(Received 10 February 2014 ,Accepted 4 March 2014)

Keywords: *Cryptosporidium baileyi*, wild pigeons, Baghdad

ABSTRACT

This study revealed the prevalence of *Cryptosporidium* parasite by using 120 fecal sample from wild pigeons in Baghdad city during the period Jounuary2013 to December 2013. The total infection rate was 40% [48/120] which divided in to 38.18% [21/55]in males and 41.53%[27/65] in females. A high infection rate 76.66% [23/30] was recorded in winter season, while a low infection rate 16.66%[5/30] was found in Autumn. The three *Cryptosporidium* species oocysts were detected varied from small (*Cryptosporidium meleagridis*), medium (*Cryptosporidium baileyi*) and large size(*Cryptosporidium galli*).

INTRODUCTION

Protozoa of the genus *Cryptosporidium* are apicomplexan parasites that complete their biological cycle in the surface of epithelial cells of digestive and respiratory system of wide variety of vertebrates[1]. Once considered rare and irrelevant. *Cryptosporidium* spp. are now known to be important pathogens with a widespread distribution in livestock, wildlife and human [2]. Cryptosporidiosis has been reported in more than 30 species of birds in many countries [3]. Transmission of the infection occurs via the oocysts."Many human infections have been traced to the contamination of drinking water with oocysts from agricultural run-off (i.e., drainage from pastures) so it is considered a zoonotic diseases[4]. Most mammals, birds, reptiles and fish are susceptible to *Cryptosporidium* infection. The aim of this study was the investigate the presence of *Cryptosporidium* spp. in wild pigeon in Baghdad city.

MATERIALS AND METHODS

A total of 120 wild pigeons been Caught from the houses roofs in Baghdad city during the period Jounuary2013 to December 2013. The classification of the species of pigeon according to [5], the pigeon below *Columba livia*. The samples were returned to the laboratory parasitology in College of Veterinary Medicine in Baghdad.

Fecal examination for *cryptosporidium* oocysts: Fecal samples were collected from the rectum of all dissected pigeons and store at 4 c° in 2.5%(w/v) potassium dichromate solution until they were used. Thin smear were made of all concentrated fecal samples. And screened for *cryptosporidium* oocysts by using modified Ziehl-Nielsen stain[6]. After staining, the slides were examined under a light microscope

(100x) show the oocysts of *cryptosporidium*. calibrated the size of oocysts by evaluating 50 oocysts with ocular micrometer[7].

Statistical analysis: The data were analyzed with the Chi – square test [8].

RESULT AND DISSCUSSION

1- Total infection rate :

The total infection rate was 40% [48/120] which was divided into 38.18% [21/55] in males and 41.53% [27/65] in females [table, 1] .

Table (1). The total infection rate of *cryptosporidium* spp .in wild pigeon according to the gender .

Sex	No. of birds examined	Infected	Percentage (%)
Males	55	21	38.18
Females	65	27	41.53
Total	120	48	40

The extent of *Cryptosporidium* oocysts invasion in pigeons in this study was found to be 40% these finding was higher than [5.9% and 0.24%] detected by [9] in pigeon from canary islands and [10] in pigeons from Iran. The variation in the invasion extensities of *Cryptosporidium* oocysts in pigeons examined during the present. Study and those previously surveyed are probably attributed to the number of birds examined , time of feces collection and examination and its surrounding environment . On the same approach , [11] and [12], also proved that the variation in Coccidian oocysts incidence in birds was climatic conditions , stresses exposed by birds was associated with the age and sex of the birds examined, the methods used to make the diagnosis. The results also showed that sex of the pigeon under this study have no significant effect on the prevalence of *Cryptosporidium* infection wild pigeons The results were similar to [13,14].

2- Infection rate according to seasons:

Table (2).was showed a the high infection rate 76.66% [23/30] in winter season, while a low infection rate 16.66% [5/30] was found in Autumn[table 2].

Table (2). The total infection rate of *Cryptosporidium* spp .in wild pigeons according to season.

Season	No. of birds examined	Infected	Percentage (%)
Winter	30	23	76.66
Spring	30	12	40
Summer	30	8	26.66
Autumn	30	5	16.66
Total	120	48	40

The results showed that high infection rates occurred in Winter probably due to climatic changes in moderate temperature and high humidity which many influence the life cycle of *Cryptosporidium* spp[13,15].

3 –Morphological anayliasis:

The measurements of detected Cryptosporidia oocyst in the examined pigeons feces revealed three Cryptosporidia species of spherical or ovid shaped oocysts . they were varied from small sized (*Cryptosporidium meleagridis*) oocysts of 4.0x5.2 μm dimension , medium sized(*Cryptosporidium baileyi*) oocysts of 6.2x4.5 μm dimension and large sized(*Cryptosporidium galli*) oocysts of 8.0x6.5 μm dimension[table3, Fig 1].

Table (3). The dimension of Cryptosporidial oocyst detected in wild pigeon.

Dimension (Mm)	species of Cyptosporidium	Shaped
8.0x6.5	<i>C. galli</i>	Spherical
6.2x4.5	<i>C.baileyi</i>	Ovid
4.0x5.2	<i>C . meleagridis</i>	Spherical

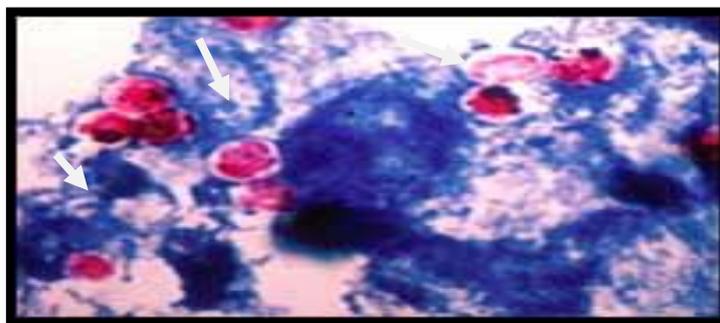


Fig (1) *Cryptosporidium* spp in feces of wild pigeon (100x)

The three Cryptosporidial species (*Cryptosporidium meleagridis* , *Cryptosporidium baileyi* and *Cryptosporidium galli*) were detected in pigeons fecal smears in this study were morphological similar with the same species detected in birds in many previous studies [16,17, 18].The *cryptosporidium* spp. Identification was depending upon the conventional criteria , such as oocyst morphology and measurements , this opinion was agreed with [11], who cited that morphometric measurements for oocysts represents the cornerstone of *Cryptosporidium* taxonomy and is one of the requirements for establishing a new species [18]. Acoccidian parasites of humans and animals was first believed to be an opportunistic organism but now is recognized as a primary pathogen , several studies have implicated animals as a source of human infection [19,20] because strains *Cryptosporidium* detected in this study are cross- transmissible especially *Cryptosporidium meleagridis* , awareness of cryptosporidiosis as a potential zoonotic infection has emerged as a significant public health concern [21].

انتشار داء الابواغ الخبيثة في الحمام البري في مدينة بغداد - العراق

أزهار علي فرج

قسم الطفيليات, كلية الطب البيطري, جامعة بغداد, بغداد, العراق.

الخلاصة

أظهرت الدراسة انتشار طفيلي الكريبتوسبورديوم باستخدام 120 عينة براز من الحمام البري لمدينة بغداد خلال المدة كانون الثاني 2013 – كانون الاول 2013. بلغت نسبة الإصابة الكلية 40% (120/48) توزعت بواقع 38.18% (55/21) في الذكور و 41.53% (65/27) في الإناث. سجلت أعلى نسبة أصابه 76.66% (30/23) في فصل الشتاء ، و اوطئ نسبة اصابة 16.66% (30/5) وجد في فصل الخريف. تم الكشف عن ثلاثة أنواع من الكريبتوسبورديوم بأحجام مختلفة الصغيرة *Cryptosporidium meleagridis* والمتوسطه *Cryptosporidium baileyi* والكبيرة الحجم *Cryptosporidium galli* .

REFERENCES

- 1-Xiao, L. ;Fayer R. ; Ryan, U. and Upton, S.J.(2004) *Cryptosporidium* taxonomy:recent advances and implications for public health. Clin Microbiol Rev;17:72--97.
- 2-Fayer,R.(2004) *Cryptosporidium*; Awater – borne zoonotic parasite . Vet.Parasitol; 126 ,37-56.
- 3-Morgan,U.M.; Monis ,L .; Raidal; O Donoghue ,P.,Gasser,R.; ,B.L.;Lal,A.A. and Thompson,R.C.A.(2001) Molecular and phylogenetic characterization of *Cryptosporidium* from birds. Internat. J.Parasitol; 31,289-986.
- 4-Ryan, U.M.(2010) *Cryptosporidium* in birds ,fish and amphibian. Exp. Parasitol., 124: 11-120.

- 5-AL-Leoss, B. (1961) Iraqi birds. pressi Alrhabatta , part II.Baghdad.pp 150.
- 6-Oie world organization for Animal Health .Manual of Diagnostic tests and vaccines for terrestriid animals. 5th . 2005 Ed. Retriveved from Internet: <http://www.Oie.Intl>.
- 7- Thienpont, E.; Rochette, F. & Vanparijs, O. F. J. (1986). Diagnosing helminthiasis through cavological examination. Janssen Research foundation.,56:26-29.
- 8- Mohammed,N.;Al-Rawy, K.M.;Younis,M.A.and Alermrana ,W. K.(1986) Princibles of Statistics printing House for printing books . Mosual University , 445.
- 9-Nestro,A.A.; Pilar,F.R. ;Mercede,L.and Basilio,V. (2009) Occurrence of *Cryptosporidium Hominis* in pigeons (*Columba livia*) . Acta parasitol , 54(1): 1-4.
- 10- Mohammed , h. ; Radfar, S. F.; Ehsan, N. A.; Mohammed, M.D. and Hadi, R.S.N.(2011) Asurvey of parasites of domestic pigeon (*Columba livia*) in South Khorason. Iran . Medwell, J Vet. Resear..4(1) :18-23.
- 11- Fayer, R. Morgan,U. AND Upton , S. J. (2000) Epidemiology of *Cryptosporidium* : Transmission, detection and identification . Int.J.Parasitol. ., 1322-30:1855.
- 12- Ramires, N.E. ;Wared , L.A. and Sreevats,S.(2004) Areview of the biology and epidemiology of cryptosporidiosis in human and animals . Microbes Infect., 6:773-785.
- 13- Mirzaei,M.; Mohammad,i.v. and Fotouhhi, A.(2008)Prevalence of intestinal *Cryptosporidium* infection in Kerman pigeons . Scien Resear. Iran Vet. J. ; 4(2 (19));115-121.
- 14- Bomfim,T.C.; Gomes,B.S and Couto (2013) The importance of poultry in environmental dissemination of *Cryptosporidium* spp . Vet .Scie. J. 7, pp12-17.
- 15-Kassa, H; Harrington,B.H.;Bisei,M.S.(2004)Cryptospridiosis : a brief literature review and update regarding *Cryptosporidium* in feaces of Ganda geese (*Branta Canadensis*) J.Environ Hlth , 66:34-40.
- 16-Fujno,T.(1996) Infectivity of *Cryptosporidium* spp. isolated from chickens in Japan to Turkey , bobwhite quails and several kind of experimental animals. Jap. J.Parasitol.,45:295-298.
- 17- Ruan, U.M. ; Xiao, L. ;Read,C.;Sulaiman,I.M.and Monis, P.(2003) Are-description of *Cryptosporidium galli* (Pavlasek,1999) Apicomplexa: cryptosporidae) from birds . J.Vet. Parasitol.,89:809-813.

- 18- Behzadi,M.A.;Razavi,S.M.;Yazda napoor,H.; Mirzaei,A.;Tamadon ,A. and Jarddani,M. (2009)Epidemiology of *Cryptosporidium* infection in Ostriches (*Struthio camelus*) In Iran. Bul. J. Vet. Med., 12(1) 55-61.
- 19- Levine, J.F. ; Levy,M.G.Walker,R.L. and Crittenden, S.(1988) Cryptospridiosis in veterinary studends . J. Am.Vet.Med.Assoc.,193:1413-1414.
- 20- Caver, J.A. ;Hill,J.E. and Thompson,S.J. (1996) Surveillance of Cryptosporidia in veterinary diagnostic laboratory .J.Vet. Diagn .Invest., 8:496-500.
- 21- Hoerr,F.J.;Current ,W.L. and Haynes, T.B. (1986) Fatal Cryptospridiosis in quail.Avian Dis.,30:412-425.