

Some studies on gastrointestinal parasites infecting wild birds At Alexandria zoo

Karema, M.El Bakery

Parasitology Dept., Animal Health Research Institute Alexandria Branch

Abstract

In this study 260 birds belonging to nine species of birds at Alexandria zoo were coprologically examined for gastrointestinal parasites. The investigated zoo birds were; 80 pigeons, 80 Chinese geese, 50 peacock, 20 peafowl, ten ducks, eight pheasant, eight parrot, two emu and two ostrich. All birds in Alexandria zoo kept under good hygienic management. The cages of peacock, peafowl and pigeons were cleaned daily as well as fresh food and water were supplied daily according to the routine management of zoo veterinary care. Out of 260 investigated birds 120 (46.1%) were found positive for parasitic infection, eggs of *Ascaridia* sp. *Capillaria* sp. *Heterakis* sp. and Nematode egg were observed in 31 (25.8%), 47(39.1%) (14.1%), and 7(5.8%) of faecal samples, respectively. The oocysts of *Coccidia* 15.0% were (*Eimeria mayurai* in peafowl and peacock at an incidence of 20.0% and 8.0% respectively). *Eimeria coulamba* oocysts and *E. Labbeona* oocysts in pigeon at an incidence of 7.5% and 5.0% respectively.

Key words: *Eimeria coulamba*, *Eimeria mayurai*, *Heterakis* sp., *E. Labbeona* oocysts.

Introduction

Birds in zoological parks are under constant stress due to captivity and are prone to various bacterial, viral, fungal and parasitic infection. Among those parasitic diseases are the most common and cause considerable loss to wildlife. A number of parasites are responsible for illness and death of captive birds and thus greatly influence the success of bird management in the zoo (Parsani 2003). Nowadays, due to scarcity and expensive costs of zoo birds all over the world, particular attention was paid to them as a national wealth in some countries. In Egypt, little attention is known about parasitic infection profile particularly the internal parasites infection among zoo birds.

The climatic condition in Egypt are more or less favorable for development of different parasites which induce death or defect in general health condition (Selim 1988).

The present study was therefore conducted to record the incidence of gastro intestinal parasitic infection among zoo birds at Alexandria province.

ducks, eight pheasant, eight parrot, two emu and two ostrich. Faecal samples were collected from the different zoo birds in a clean sterile poly-ethylene bags labeled with a different data as species and date then transferred immediately to the laboratory for parasitological examination. The collected faecal samples of each bird were examined by direct smear technique. The negative one was subjected for further examination by concentration floatation technique using saturated salt solution and sugar solution as well as sedimentation technique as described by (Kruse, 1982). *Eimeria* species were identified after sporulation in 2.5% aqueous potassium dichromate solution according to Pellerdy, (1974), Adam *et al.*, (1979), Soulsby, 1982 and Levine, (1985 a & b) and the parasitic eggs identified according to Soulsby 1982.

Material and Methods

The investigated zoo birds were 80 pigeons, 80 Chinese geese, 50 peacock, 20 peafowl, ten

Results

Table (1). Incidence of parasitic infection among wild birds at Alexandria Zoo.

Host	No. of examined bird	+ve	%	parasites				
				Ascaridia spp.egg	Capillaria spp.egg	Heterakis Spp.egg	Nematode egg	Eimeria oocyst
Pigeon	80	43	53.7	12(15.0%)	21(26.2%)	—	—	10(12.5%)
Chinese geese	80	30	37.5	6(7.5%)	—	17(21.2%)	7(8.7%)	—
Peacock	50	24	48.0	—	20(40.0%)	—	—	4(40.0%)
Peafowl	20	11	55.0	3(15.0%)	4(20.0%)	—	—	4(20.0%)
Duck	10	6	60.0	6(60.0%)	—	—	—	—
Pheasant	8	3	37.5	3(37.5%)	—	—	—	—
Parrot	8	3	37.5	1(12.5%)	2(12.5%)	—	—	—
Total	260	120	46.1	31(25.8)%	47(39.1%)	17(14.1)%	7(5.8%)	18(15.0%)

Table (2). Incidence of Eimeria spp infection among wild birds at Alexandria zoo .

Host	No of examined bird	+ve	%	Eimeria spp		
				E.mayuria	E .columba	E.labbeona
Peafowl	20	4	20.0	4(20.0%)	—	—
Peacock	50	4	8.0	4(8.0%)	—	—
Pigeons	80	10	12.5	—	6(7.5%)	4(5.0%)
Total	110	18	16.3	8(7.2%)	6(5.4%)	4(3.6%)

Table (3). Morphological characteristics of sporulated Eimeria oocysts species in zoo birds.

Eimeria Species	Size(μm)	Shape	Color of oocyst	Oocyst polar cap	Shape of sporocyst
Eimeria mayurai	23-27 x 13-16	Ellipsoid	colourless	absent	elongate to ellipsoidal
Eimeria columbae	15.8-16.4 x 12.5-13.4	Spherical to sub-spherical	colourless	absent	ellipsoidal
Eimeria labbeana	19.5-24x118-22	Spherical to sub-spherical	colourless	absent	elongate to ovoid

In the present investigation, examination of faecal sample and infection rates with the internal parasites in zoo birds. were recorded in table (1) Out of 260 investigated birds 120 (46.1%) were found positive for parasitic infection .Eggs of Ascaridia sp , Capillaria sp ,Heterakis sp and Nematode egg were observed in 31/120 (25.8%) , 47/120 (39.1%),17/120(14.1%) and 7/120(5.8.0%) of

faecal samples, respectively. **Ascaridia sp** were at an incidence of 37.5%, , 12.5%, 15.0%, 15.0, 7.5% and 60.0% in pheasant ,parrot, peafowl , pigeon, chinese geese and ducks respectively. **Capillaria sp** were 12.5%, 26.2%, 40.0% 20.0% in parrot, pigeon, peacock and peafowl respectively. **Heterakis sp** was 21.2% in chinese geese and **Nematode eggs** were 8.7% in chinese geese (**Table 1**).

While the oocysts of Coccidia (**Eimeria mayurai** in peafowl and peacock at an incidence of 20.0% and 8.0% respectively **Eimeria coulamba** oocysts and **E. labbeona** oocysts in pigeon at an incidence of 7.5% and 5.0% respectively (Table 2). Eggs of **Ascaridia** sp. ranged from 60-72x 32-40 μ m thick smooth 3-layer shell the middle layer is most developed while **Capillaria** sp. eggs are barrel shape with thick shelled and measure 0.052 x 0.025 μ m.

Heterakis spp eggs are round with thick shelled, measuring 0.066-0.079 μ m x 0.033 – 0.038 μ m. and **Nematode** eggs were medium size egg 65-75 x 35-42 μ m long ovoid thin shell

with smooth surface parallel side-walls. Different species of Eimeria were reported. **E. mayurai** oocysts were ellipsoidal in shape with smooth wall and 18-27 x 13-20 μ m and elongate to ellipsoidal sporocyst. **E. labbeona** oocysts was detected as subspherical with two layered wall, an inner dark and outer lighter one 13-24 x 13.24 μ m and elongate to ovoid sporocyst. **E. columbae** oocyst was measured 16.4x14.3 and had a thin wall spherical to subspherical and ellipsoidal sporocyst (Table 3). While, the examined faecal sample from each of, Emu and Ostrich were free from any intestinal parasites.



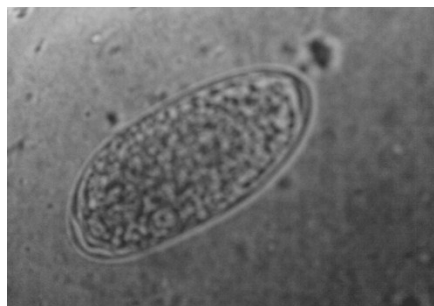
Fig (1) Ascaridia spp x400
thick smooth 3-layer shell.



Fig (2) Capillaria spp egg x400
barrel shape with thick shelled.



Fig(3) Heterakis spp. x400
round with thick shell



Fig(4) Nematode egg x400
long ovoid thin shell



Fig(5) E..mayuri x100
ellipsoidal in shape

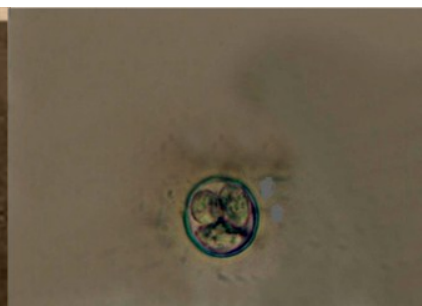


Fig (6) E.columbae x100
spherical oocyst



Fig(7) E. labbeanae x100 subspherical oocyst

Discussion

Examined faecal samples from, Emu and Ostrich were negative to any intestinal parasites similar results were obtained by (Hillgarth, 1989 and Penny, 1998, Freitas, 2002, Parsani, 2003, Subramanian, 2003, Ahmed, 2005, Samuel, 2001 and Mushi, 2003) who said that there was no Eimeria sp. oocyst in faecal samples of captive wild ostriches at Mokolodi nature reserve.

Eggs of *Ascaris* and *Capillaria* species were observed in 25.8, and 39.1% respectively in faecal samples such finding were also recorded by Pande (1970), Soulsby (1982) and Sandra *et al.* (2007) in wild birds.

Heterakis spp and Nematode eggs recorded in an incidence of 14.1% and 5.8% respectively (table 1) such finding were also recorded by (Muraleedharan, 1990, Islam, 1991, Reddy, 1992, Patel, 1998 and Parsani, 2001. The incidence of Eimeria mayurai in peafowl and peacock was 20.0% and 8.0% respectively, and in pigeons was E.columba and E.labanea at an incidence of 7.5% and 5.0 %0respectively. The obtained result of E.labanea was similar to that recorded by Githkopoulos and Liakos, (1987) (4.5%) and the result was lower than that mentioned by Martinez *et al.*, (1989) (63.3%), Sar *et al.*, (2008) (58.1%) and Gul *et al.* (2009) (71.9%).

The prevalence of Eimeria columbae in the present result was 7.5% which was lower than that mentioned by Sar *et al.*, (2008) (22.1), Ibrahim *et al.*, (1995) (29.5%). and Aschenbrenner, 1988 71.8% in the examined wild birds, while Kullsic, 1989 detected coccidian oocyst in 25% of young pigeons and 31.9% of adult ones from different districts of Belgrade, Yugoslavia. Nearly similar results were obtained by McQuistion, 2000 found 20.9% of passer-

ine birds from South America were infected with Coccidian parasite. Patel (1998) recorded 17.92% of the captive birds maintained in Gujarat zoos, India was infected with Eimeria spp. oocysts. Also Williams (2000) found Eimeria spp. in 36% of wild northern bobwhite Quail C. Virgianus from Lyon country, Kansas.

These variations might be attributed to localities, hygienic measures, and environmental conditions.

References

- Aschenbrenner, R.F. (1988). "Parasite infection of wild and poned black grouse (Lyrurus Tetrix) and CaperCaillia (Tetraourogallus) in Austria". Thesis, degree of veterinary Medicine, Institute for Parasitology, Vienna, Austria.
- Adam, K.M.; Paul, J. and Zaman, V. (1979). Medical and Veterinary Protozoology. Revised Edition Churchill Livingstone. Edinburgh and London.
- Ahmed, Eman, M. (2005). [Studies on Enteric protozoa of some wild animal at zoo of Alexandria] Ph. D Thesis Faculty of Veterinary Medicine Alexandria University
- Freitas, M.F.L.; Oliveira, J.B.; Cavalcanti, M.D.; Leite, A.S.; Magaihaes, V.S.; Oliveira R.A. and Sobrino, A.E. (2002). "Gastrointestinal parasites of captive wild birds in Pernambuco state, Brazil" Parasitological Latino Americana, 57: 50-54.
- Githkopoulos, P.R. and Liakos, V.D. (1987). Parasites of the alimentary tract of pigeons in Greece. Deltion Tes Ellenikes Kteniatrikes Etaireias Bulletin of the Hellenic Veterinary Medical Society, 38 (2). 79 – 83.
- Gul, A.; Ozdal, N.; Deger, S. and Denizhan, V. (2009). Prevalence of coccidia and helminth species in domestic

- pigeons (*Columba livia domestica*) in Van. [Turkish]. Yuzuncu yl Universitesi Veteriner Fakultesi Dergisi, 20(2). 45 – 48.
- Hillgarth, N.; Norton, C.C.; Pierce, M.A.; Cox, B.S. and Cooper, J.E. (1989).** “Monitoring parasites in wild and captive green peafowl in Thailand”. Diseases and Threatened birds, 10: 129-134.
- Ibrahim, A.I.; Hassanin, H.H.; Aly, S.E. and Abel-Aal, A.A. (1995).** A study on some parasitic affection in domestic pigeons in Ismailia Province. Assuit Vet. Med. J., 34(67). 153 – 161.
- Islam A.M.W.(1991).** Incidence of helminth parasites of guinea fowl in Zambia .Abstract of the Inter national Seminar on Veterinary Medicine in Wild and Captive Animals, Bangalore p.28.
- Kruse, G.O.W. and Pritchard, M.H. (1982).** The collection and preservation of animal parasite. University of Nebraska press-Lincoln and London.
- Kullsic, Z. (1989).** “Parasitical infection among pigeons (*Columbalivia*) of different ages in the area of Belgrade”. Acta. Vet. Med. 39: 155-162.
- Levine, N.D (1985a).** Veterinary Protozoology.1st Ed. Ames. Iowa state University Press, Ames Iowa, USA.
- Levine, N.D. (guide to 1985b).** Phylum II- Apicomplexa Levine, 1970. In an illustrated protozoa (J.J., S.H. Hutner and E.C. Bovee. Ist Ed.) PP 322 – 374.
- McQuistion, T.E. (2000).** “The prevalence of coccidian parasites in passerine birds from south America”. Transactions of the Illinois state Academy of Science, 93: 221-227.
- Martinez, M.F.; Martinez, M.A.; Becerra, M.C. and Martinez, C.M. (1989).** Parasite fauna of pigeons (*Columba livia*) in Cordoba Province, Spain. J. Revista Iberica de Parasitologia., 49(4). 279 – 281
- Muraleedharan,K.V Iswariah, S, K. Ziauddin and Srinivasan (1990).** Asurvey of gastro intestinal parasites of mammals of zoological garden at Mysore. Mysore Journal of Agricultural Science 24:250-256.
- Mushi, E.Z.; Binta. M.G.; Chabo, R.G. and Toto, P.A.S. (2003).** “Anote on endoparasite of wild ostriches (*Struthio Camellus*) in the Mokolodi Nature Reserve, Gaborone, Botswana; J. South Afr. Vet. Assoc. 74: 22-23.
- Pande B,P., B.B. Bhatia ,p,p,s Chauhan and R,K. Garg (1970).**Species composition of coccidia of some of the mammals and birds at the zoological garden.Lucknow. Indian Journal of Animal Science 40:154-163.
- Pellerdy, L.P. (1974).** Coccidia and coccidiosis. Akad. Kiado. Budapest.
- Parsani; H.R Momin R.R. and. Bhuva C.N (2001).**Parasitic infection among captive birds at Sakkarbagh Zoo, Junagadh, Gujarat Zoos Print Journal 16(4). 462-464.
- Parsani, H.R.; Momin, R.R.; Sahu, R.K. and Patel, B.G. (2003).** “Prevalence of gastrointestinal parasites in captive birds at Kamla Nehru Zoological garden, KanKaria zoo, Ahmedabad, Gujarat”. Zoo’s Print J. 18: 987-992.
- Patel P.V.;A.I,Patel,R.k.Sahu and R. Vyas (1998).**Helminthic infection in captive wild birds of Gujarat Abstract X National Congress of Veterinary Parasitology, Jabalpur,p.72.
- Patel, P.V.; Patel. A.I.; Sahu, R.K.; Raju. Vyas and Vyas, R. (2000).** “Prevalence of gastro-intestinal parasites in captive birds of Gujarat zoos”. Zoo’s Print. J. 15: 295-296.
- Penny Cott, T.W.; Ross, H.M.; McLaren, I.M.; Hopkins, G.F. and Foster, G.**

- (1998). "Causes of death of wild birds of the family Fringillidae in Britain". Vet. Rec., 143: 155-158.
- Reddy N.R., J.M.S. Jagannath, P, E., D'souza and S.A.Rahman (1992).** Prevalence of gastrointestinal parasites in wild mammals and captive birds at Benner ghatta National Park. Bangalore, India Indian Journal of animal Science 62: 1046-1048.
- Sar, B.T.; Karatepe, B.I.; Karatepe, M. and Kara, M. (2008).** Parasites of domestic (Columba livia domestica) and wild (Columba livia livia) pigeons in Nigde, Turkey. Bulletin of the Veterinary Institute in Pulawy, 52(4). 551 – 554.
- Samuel, W.M.; Pybus, M.J. and Alan Kocan, A. (2001).** "Parasitic diseases of wild Mammals". 2nd Ed. Iowa State University Press.
- Sandra, M. T.; Marques, Rosileia .M. and Marisa, B.(2007).** Parasites of pigeons (Columba livia) in urban areas of lages, Southern Brazil. Parasitol. latino-am. v.62 n.3-4 Santiago dic
- Selim, A.M.A. (1988).** "Some studies on parasitic diseases of zoo animals in zoological gardens". Ph. D. Thesis, Faculty of veterinary Med. Zagazig Univ.
- Solusby, E.J.L. (1982).** "Helminths, Arthropods and protozoa of Domesticated animals". 7th Ed. Williams and Wilkins Co., Baltimore, 824
- Subrniaaman, K.S.; John, M.C. and Raman, M. (2003-a).** "Morphometric studies on parasitic fauna of free-ranging Indian peafowl (Pavo Cristatus)". Zoo's Print. J. 18: 1055-1056.
- Williams, C.K.; Davidson, W.R., Lutz, R.S. and Applegate, R.D. (2000).** "Heath Status of northern bobwhite Quail (Colinus virginianus) in eastern Kansas". Av. Dis. 44: 953-956.

بعض الدراسات عن الطفيليات المعدية المعوية التي تصيب الطيور البرية في حديقة الحيوان بالإسكندرية

كريمة محمد البكري

قسم الطفيليات - معهد تشخيص وبحوث صحة الحيوان (فرع الإسكندرية)

الملخص العربي

في هذه الدراسة تم الفحص الطفيلي لعدد 260 طائر بمختلف الأنواع من الطيور البرية في حديقة الحيوان بالإسكندرية وكانت كالأتي: 80 حمام، 80 أوز صيني، 50 طاووس، 20 دجاج وادي، 10 بط، 8 فزان، 8 ببغاء، 2 نعام، 2 إيمو وقد كانت نتيجة الفحص كالأتي:

- بويضات الإسكارس (25.8%) - بويضات كابيلاريا (39.1%) بويضات الهيتراكس (14.1%) - بويضات نيماتودا (5.8%) وحوصلات إيميريا (15.0%).

كما تم توصيف الطفيليات التي تم تسجيلها وصفا ظاهريا دقيقا. وهذه الدراسة تلقى الضوء على الدور الذي تلعبه الطيور البرية في التلوث البيولوجي للبيئة وكذلك في نقل الطفيليات المشتركة إلى الإنسان خاصة المتعاملون معها في حدائق الحيوان. ونشر الوعي بين الزائرين كي يراعى الحذر في التعامل مع هذه الطيور.