Bull. Iraq nat. Hist. Mus.
(2002) 9 (4): 41–49

THE PARASITIC FAUNA OF THE MOORHEN *GALLINULA CHLOROPUS CHLOROPUS* L. IN THE MIDDLE OF IRAQ

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ABSTRACT

Examination of the blood and the alimentary canal of moorhens in two sites around Baghdad area in the middle of Iraq showed that 38% of the examined birds were infected with one or more of the following parasites, *Haemoproteus baghdadensis, H. gallinulae* (Protozoa), *Cyclocoelum mutbile* (Trematoda), *Diorchis inflata, Ligula intestinalis* (Cestoda), *Amidostomum fulicae* and *Porrcaecum* sp. (Nematoda) .The stomach analysis revealed that the bird is omnivorous in feeding including wid range of invertebrate animals with some plant origin food items.

INTRODUCTION

Works on parasites of Iraqi birds are rather few and scanty. Except for chickens (Al-Hubaity, 1976; Al-Hubaity and Al-Habib, 1979) and some pigeons (Al-Janabi *et al.,* 1980; Zankana, 1982; Mustafa, 1984; Al-Aloosi,1985; Sawada *et al.*,1987; Sawada and Mohammad, 1989), most works deal with only some common birds scattered over a wide range of avian orders (Mohammad, 1990 ,1991, 1996, 2002; Mahmoud and Mohammad, 1989; Mahmoud *et al.,* 2000). Mahmoud and Mohammad (1989) was the only report on parasites of Rallidae in Iraq. They studied the helminths of the coot, *Fulica atra* L. in Baghdad area and reported four helminthes.

The avian family Rallidae comprises eight species in Iraq (Allouse, 1961) among them the moorhen which is wide spread throughout middle and south of Iraq since it has wide tolerance to rainfall, humidity, temperature and wind strength. It causes some damage to vegetable crops in the middle and south (Yousif, 1979). It inhabits lakes, swamps and marshy areas especially with dense reed and prefers waters sheltered by woodland or tall emergent plants and exploits wide range of both natural and man-made wetlands and adapted to both still and moving water (Cramp, 1980; Ritter and Savidge, 1999). It is an opportunistic breeder in freshwater habitats of Arabia (Jennings, 1999). Its populations in Iraq are either breeders or winter visitors in suitable areas in the middle and south of the country.

The present work deals with the parasitic fauna of the moorhen in the middle region of Iraq including notes on some biological aspects.

MATERIALS AND METHODS

A total of 50 specimens of moorhen were collected from swamps and small marshy areas around Baghdad City and Suwaira- Wasit province during 1998-2002. Blood films were often taken immediately from brachial vein or sometimes from the heart, air-dried, fixed in absolute methanol and stained with Giemsa's stain at strength of 1:10. Then the birds were dissected, the coelom of the body was searched carefully and the intestine kept in 70% alcohol and transferred to the laboratory. The trematodes and cestodes were stained with acetocarmine,

cleared in xylene and mounted in Canada balsam, while nematodes cleared and examined in lactophenol.

RESULTS AND DISCUSSION

Table 1 summarizes the results on the incidence of parasites in the moorhen in this study. It shows that 22 specimens (44 %) of the total sample harbored either single or mixed infections with one or more species of parasites.

Infection with *Haemoproteus* spp. ranks first among other parasites with rate of 12% for both of *H. baghdadensis* Mohammad , 2000 (figs 1-2) and *H. gallinulae* (figs. 3-4). Shamsuddin and Mohammad (1981) found no haematozoa in the blood of the two moorhens they examined while Mohammad (2000) found that only 3.6% of the moorhens were infected with *H. baghdadensis* but without mixed infections with other species of *Haemoproteus*. However, acquiring infection of relatively high rate with two haemoproteids may reflects the fact that the two collection sites (swamps and marshy areas around Baghdad city and Suwaira - Wasit province) are of high vector potentiality. This is especially true for that different stages of growth of the parasites could be detected easily in the same blood film, which reveals that the birds are continuously bitten by vector/s during the course of the year especially during the hot and moderate seasons which last for about nine months in Iraq. Although the present parasite specimens from different birds are keyed well to be *H. gallinulae*, some taxonomic measurements (table 2) seems smaller than that provided by Bennett (1980). This may represents physiological differences among their allopatric hosts. Cucco *et al.* (1999) and Van Duyse *et al.* (1999) confirmed presence of geographical differences among moorhens.

The moorhen is omnivorous and this makes it a potential host for a wide variety of endoparasites. Pollock and Ohalloran (1995) found that feeding was the most important activity of the bird and represents 38% of the time utilization. This activity apparently not affected by the colder and warmer periods of a day (Acquarone *et al.*, 2001). Preliminary observations on stomach contents showed presence of spiders, larvae of insects, snails of the species; *Lymnaea auricularia* , *Monacha obtusata* and *Physa acuta*, and the earthworm *Allolobophora* sp. along with some plant-origin food items including seeds, fruits and pieces of leaves. However, gregarious breeding of this bird may contributes to the diversity of parasitic fauna during the reproduction season (Macrae, 1995, 1997, 1998; Mcrae and Burke, 1996; Post and Seals, 2000).

The termatode *Cyclocoelum mutabile* (Zeder, 1800) is found in the body cavity of the bird with infection rate of 2% (table 1). This is in accordance with Mahmoud and Mohammad (1988) who found the coot *Fulica atra* examined in Baghdad area were infected with this trematode. This parasite and some other species of *Cyclocoelum* were frequently reported in the body cavity of moorhens in Europe, Egypt, India and Americas (Bhutta and Khan, 1975; Kinsella *et al.*, 1975; Iskova, 1978; El-Naffar, 1979 a, b; Fernandes, 1979).

The cestode *Ligula intestinalis* (L.) (Pseudophyllidea: Diphyllobothridae) is widely distributed throughout the Northern Hemisphere. Yamaguti (1959) reported adults from 16 genera of birds and mentioned that fishes belong to 27 genera and copepods (Crustacea) act as intermediate hosts for larval stages of this cestode. On the other hand, the cestode *Diorchis inflata* (Rud.) (Cyclophyllidea: Hymenolepididae) was frequently reported from ducks and coots in Europe and Asia (Yamaguti, 1959; Macko, 1968; Olszewaska, 1979; Volkonuova, 1979; Pojmanska, 1982; Mahmoud and Mohammad, 1989). In Iraq, Mahmoud and Mohammad (1989) found this cestode the most common among other parasites of the coot *Fulica atra* L. in Baghdad area and concluded that the intermediate host is more common in the diet of the host.

The nematode *Amidostomum fulicaes* (Rud.) was reported in Iraq from *Fulica atra* under the lining of stomach (Mahmoud and Mohammad, 1989) . Reporting it from moorhen is not surprising since it shares the coot almost the same food requirements . The other nematode *Porrocaecun* sp. was reported in Europe and North America from a wide range of avian hosts including *Gallinula* spp. (Yamaguti , 1961 ; Yorke and Maplestone , 1962) . The authers tentatively identified this nematode because only two specimens were available for examination . Laval forms were found in earthworms belonging to genera *Lumbricus* and *Octolasium* (Yamaguti , 1961) . However earthworms belong to genus *Allolobophora* constitute one of the food items utilized by this bird as revealed by stomach analysis in this study .

Reporting of *H. gallinulae* constitutes the first record for Iraq while reporting of *Diorchis inflata, Ligula intestinalis* and *Amidostomum fulicae* represent new host records. Presence of *H. baghdadensis* , *C. mutabile, Diorchis inflata* and *Amidostomum fulicae* in the middle area of Iraq in the coot (Mahmoud and Mohammad, 1988;Mohammad 2000) and in the moorhen in this study may be related partially to their sympatric coexistence. Cramp (1980) pointed that the distribution of the two birds overlaps along the margins of lakes and rivers with cover and open areas readily accessible from water, and since they share almost the same food and have close ecological requirements, so it is not of surprise that they share some species of their parasite burden.

Table 1: Parasite species, intensity infection and range number of parasites.

Parasite sp.	no. birds inf.	% of inf.	% of total	range (mean) no. parasite/bird
Protozoa: Apicomplexa				
H. baghdadensis	3 *	15.8	6	many
H. gallinulae	6	31.5	12	many
Platyhelminthes				
Trematoda				
C. mutabile	1	5.3	2	1
Cestoda				
Diorchis inflata	5	26.3	10	1-11 (3.7)
Ligula intestinalis	2	10.5	4	1-2 (1.5)
Aschelminthes				
Nematoda				
Amidostomum fulicae	3	15.8	6	3-13 (6.7)
Porrocaecum sp.	2	10.5	4	2-4 (3)
Total	22		44	

* mixed infection with *H. gallinulae*

Table 2: measurements of *H. gallinulae* in um followed by standard deviation in parentheses.

measurements	macrogametocyte	microgametocyte
Parasite (N=10)		
length	11.6 (0.81)	11.6 (0.88)
width	3.49(0.64)	3.2 (0.75)
area	39.08 (4.8)	38.55 (5.75)
% erythrocyte-parasite complex	71.62	72.05
Parasite nucleus (N=10)		
length	2.62 (0.49)	3.5 (1.14)
width	2.38 (0.45)	2.38 (0.46)
area	4.35 (1.42)	6 (1.8)
% area of parasite	11.77	13.12
No. of pigment granules	26.89	26

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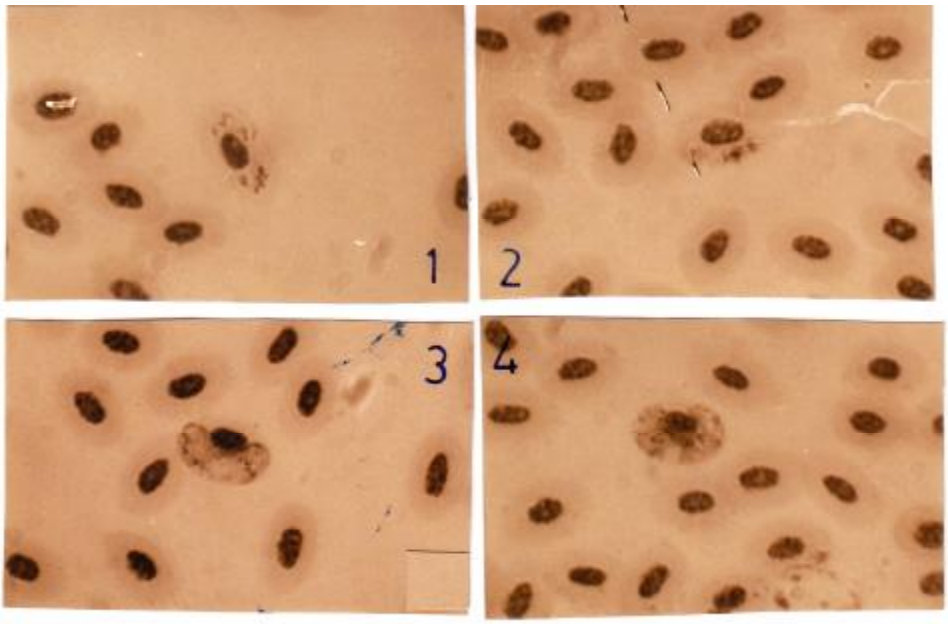
أظهرت نتائج فحص الدم والقناة الهضمية لنماذج من طير دجاج الماء في موقعين في وسط العراق إن ٣٨% من الطيور المفحوصة كانت مصابة بواحد او اكثر من الطفيليات الآتية: *Haemoproteus baghdadensis* و *H. gallinulae* (الأوالي) و *Cyclocoelum mutabile* (المحجميات) و *Diorchis inflata* و *Ligula intestinalis* (الشريطيات) و *Amidostomum fulicae* و *Porracaecum* sp. (الخيطيات).



Figs. 1-2: *Haemoproteus baghdadensis* Mohammad

Figs. 3-4: *Haemoproteus gallinulae* De Mello