

HELMINTH PARASITIC FAUNA OF AQUATIC BIRDS IN BAHR AL-NAJAF DEPRESSION, MID IRAQ

Haytham M. H. Al-Awadi*, Furhan T. Mhaisen**
and Fadhil F. Al-Joborae***

* Dept. Biol., Coll. Educ., Univ. Kufa, Najaf, Iraq

** Dept. Biol., Coll. Educ. (Ibn Al-Haitham), Univ. Baghdad, Baghdad, Iraq

*** Dept. Histol. Embryol., Coll. Med., Univ. Babylon, Hilla, Iraq

ABSTRACT

For two years, from January 1995 till December 1996, a survey on helminth parasites of aquatic birds of Bahr Al-Najaf depression, mid Iraq, was achieved. A total of 663 birds, belonging to 11 species, were captured and examined for helminth parasites. These birds were infected with seven trematodes (*Notocotylus gibbus*, *Cyclocoelum mutabile*, *Echinostoma chloropodis*, *Patagifer parvispinosus*, *Psilochasmus oxyurus*, *Diplostomum spathaceum* and *Apharyngostrigea cornu*), seven cestodes (*Paricterotaenia porosa*, *Dicranotaenia tsengi*, *Diorchis brevis*, *D. inflatus*, *Tatria acanthorhyncha*, *T. decacantha* and *Diplophallus polymorphus*) and four nematodes (*Capillaria* sp., *Eustrongylides tubifex*, *Contraecaeum* sp. and *Tetrameres* sp.). Five bird species were recorded as new hosts in Iraq for four helminths of the present investigation.

INTRODUCTION

The middle and southern parts of Iraq are good habitats for many aquatic birds (both residential and migratory) where they share adequate food and slightly warm water. Aquatic plants there provide a suitable shelter for such birds (Al-Hadithi, 1971).

Bahr Al-Najaf depression attracts a large number of aquatic birds. Al-Awadi (1997) listed 53 bird species, belonging to 21 families, in that depression.

Like other animals, aquatic birds are vulnerable to many parasitic infections which may cause considerable mechanical and chemical damages to host vital organs and may decrease host weight and its egg production (Soulsby, 1968). Some aquatic birds act as final hosts for some helminths which use fishes as intermediate hosts (Mhaisen, 1983). Some aquatic birds may transmit some pathogenic viruses to fishes (Peters and Neukirch, 1986).

The aquatic birds of Iraq received little attention from Iraqi helminthologists. Among literature concerning helminthological surveys of aquatic birds of Iraq are those of Al-Aloosi (1985), Abdullah (1988), Mahmoud and Mohamad (1989), Al-Mayah (1990), Mhaisen *et al.* (1990), Al-Hadithi and Abdullah, (1991), Al-Hadithi and Mustafa (1991), Al-Hadithi (1992), Mhaisen and Abul-Eis (1992), Abdullah (1993), Abdullah and Al-Mayah (1993), Al-Mayah (1994), Awad *et al.* (1994), Al-Daraji *et al.* (1998), Al-Mayah (1999), Mahmoud (2001), Mizhir (2002), Abed (2005) and Ali (2008).

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Apart from Mizhir (2002), no work was carried out on the helminth fauna of the aquatic birds of Bahr Al-Najaf depression. So, the present article was aimed to gain essential information on this subject and to correlate such information with those of the fish fauna of the same habitat.

MATERIALS AND METHODS

The sampling area (Bahr Al-Najaf depression) is situated southwest of Al-Najaf Al-Ashraf city. It is located between 31° 45' and 31° 57' north latitude and 44° 7' and 44° 16' east longitude (Abul-Fatih, 1970). Many desert streams flow southward from the Euphrates river and discharge their flood water in this depression. This depression also receives drainage water from the southern cultivated area. Bahr Al-Najaf depression includes a terrestrial habitat as well as an aquatic habitat.

During the period from January 1995 to December 1996, aquatic birds were collected from Bahr Al-Najaf depression by using a shotgun. Birds were immediately brought to the laboratory where they were dissected out and their alimentary canal, liver, gonads, kidneys and air sacs were removed and placed in normal saline (0.9% NaCl). Such organs were opened and inspected for parasites. Helminths were fixed in alcohol- formalin- acetic acid (A.F.A), stained in Semichon's acid carmine and mounted in Canada balsam. Bird identification was done according to Heinzel *et al.* (1974). List of Mahdi and Georg (1969) was followed for the full scientific names of the concerned birds. Helminth identification and nomenclature followed Dawes (1946), Yamaguti (1959, 1961, 1971) and Soulsby (1968). Percentage incidence and mean intensity of infection were calculated as defined by Margolis *et al.* (1982).

RESULTS AND DISCUSSION

During the two years period of the present study, 663 aquatic birds were hunted from Bahr Al-Najaf depression. These birds belonged to 11 species as demonstrated below together with their families and numbers:-

- Family Podicipitidae
- 47 *Tachybaptus ruficollis* (Pallas, 1764)
- Family Ardeidae
- 24 *Ardea purpurea* L., 1766
- 25 *Ardeola ralloides* (Scopoli, 1769)
- 38 *Botaurus stellaris* (L., 1758)
- 62 *Egretta alba* (L., 1758)
- 57 *Egretta garzetta* (L., 1766)
- Family Rallidae
- 70 *Fulica atra* L., 1758
- 42 *Gallinula chloropus* (L., 1758)
- Family Recurvirostridae
- 32 *Himantopus himantopus* (L., 1758)
- Family Laridae
- 178 *Larus argentatus* Pontoppidan, 1763
- Family Alcedinidae
- 88 *Ceryle rudis* (L., 1758)

Eighteen species of helminths (seven trematodes, seven cestodes and four nematodes) were found in the examined birds. The following is a brief account on the occurrence of these helminths.

Trematoda

Notocotylus gibbus of the present study was recorded from the intestine of both *F. atra* and *G. chloropus* with incidences of 14.2% and 14.3%, respectively and intensities of 1.2 and 1.5, respectively. Its first report in Iraq was from the same above- named hosts from Basrah (Abdullah, 1988). It is appropriate to indicate here that Mizhir (2002) had reported *N. urbanensis* from *Phoenicopterus roseus*, *Anas acuta*, *A. clypeata*, *A. platyrhynchos*, *A. strepera* and *F. atra* from Bahr Al-Najaf depression.

Cyclocoelum mutabile of the present study was recorded from the air sacs and coelom of *F. atra* with an incidence of 15.7% and an intensity of 1.1. Previously, this parasite was reported from the same host from Basrah (Abdullah, 1988) and from Baghdad (Mahmoud and Mohamad, 1989).

Echinostoma chloropodis was recorded in the present study from the intestine of both *F. atra* and *G. chloropus* with incidences of 17.1% and 21.4%, respectively and intensities of 1.1 and 1.4, respectively. Its first report in Iraq was from *F. atra*, *G. chloropus* and *Porphyrio poliocephalus* from Basrah (Abdullah, 1988). According to Yamaguti (1971), metacercaria of this trematode was found in *Viviparus contectus* of Lithuania. No metacercaria of this species is, so far, reported from fishes of Iraq (Mhaisen, 2009). It is appropriate to mention here that Mizhir (2002) had reported *E. revolutum* from *A. clypeata* and *A. platyrhynchos* in Bahr Al-Najaf depression.

Patagifer parvispinosus was recorded in the present study from the intestine of *T. ruficollis* with an incidence of 14.9% and an intensity of 1.6. Its first report in Iraq was from the same host from Basrah (Al-Mayah, 1990).

Psilochasmus oxyurus of the present study was recorded from the intestine of *F. atra* with an incidence of 21.4% and an intensity of 1. Its previous reports from Iraq were from *F. atra* in Basrah (Abdullah, 1988) and from both *Anas ferina* and *A. querquedula* in Basrah as well (Al-Mayah, 1990). Mizhir (2002) reported *P. longicirratu*s from *A. strepera* and *A. fuligula* in Bahr Al-Najaf depression.

Diplostomum spathaceum was recorded in the present study from the intestine of *L. argentatus* with an incidence of 20.7% and an intensity of 1.1. Its first report in Iraq was from *L. ridibundus* in Baiji and Al-Baghdadi regions (Al-Aloosi, 1985). Other reports included that of Mhaisen *et al.* (1990) from both *L. ichthyaetus* and *L. canus* in Basrah and that of Al-Hadithi and Mustafa (1991) from *L. ridibundus* in Basrah. So, *L. argentatus* of the present study, represents a new host record for *D. spathaceum* in Iraq. Metacercariae of this trematode are widely distributed in 22 freshwater fishes of Iraq (Mhaisen, 2004). Abdullah and Mhaisen (2007) demonstrated the experimental life cycle of this parasite in which two snails (*Lymnaea lagotis* and *L. truncatula*) served as first intermediate hosts, two fishes (*Cyprinion macrostomum* and *Cyprinus carpio*) served as the second intermediate hosts and *L. canus* as the final host.

Apharyngostrigea cornu of the present study was recorded from the intestine of *A. purpurea* with an incidence of 12.5% and an intensity of 1.7. Its previous reports in Iraq were by Abdullah (1988) and Al-Hadithi and Abdullah (1991) from the same host in Basrah.

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Metacercaria of this species was reported from mesenteries, body cavity and liver of the common carp *C. carpio* in two fish farms in mid Iraq (Salih *et al.*, 1988).

Cestoda

Paricterotaenia porosa of the present study was recorded from the intestine of *L. argentatus* with an incidence of 77% and an intensity of 2.8. Its first report in Iraq was from *L. ridibundus* in Baiji and Al-Baghdadi regions (Al-Aloosi, 1985). Other reports are from *L. ichthyaetus* in Basrah (Mhaisen *et al.*, 1990) and from *A. cinerea*, *Hoplopterus indicus* and *Chettusia leucura* from a fish farm in Babylon province (Mhaisen and Abul-Eis, 1992). So, *L. argentatus* of the present study represents a new host record for *P. porosa* in Iraq.

Dicranotaenia tsengi of the present investigation was recorded from the intestine of *H. himantopus* with an incidence of 28.1% and an intensity of 1.1. Its first report in Iraq was from the same host in Basrah (Al-Hadithi, 1992).

Diorchis brevis of the present study was recorded from the intestine of both *F. atra* and *G. chloropus* with incidences of 20% and 11.9%, respectively and intensities of 1.1 and 1.4, respectively. Its first report in Iraq was from the same hosts in Basrah (Abdullah, 1988).

Diorchis inflatus of the present study was recorded from the intestine of *F. atra* with an incidence of 17.1% and an intensity of 1.2. Its first report in Iraq was from the same host in Baghdad (Mahmoud and Mohamad, 1989). Mizhir (2002) reported *D. americanus* from *F. atra* in Bahr Al-Najaf depression.

Tatria acanthorhyncha of the present study was recorded from the intestine of *T. ruficollis* with an incidence of 19.1% and an intensity of 1.1. Its first report in Iraq was from the same host in Basrah (Al-Mayah, 1990).

Tatria decacantha of the present study was recorded from the intestine of *T. ruficollis* with an incidence of 17% and an intensity of 1.3. Its first report in Iraq was from the same host in Basrah (Abdullah, 1988). Other reports were by Al-Mayah (1990) and Al-Hadithi and Abdullah (1991) from the same host in Basrah. Mhaisen and Abul-Eis (1992) reported this cestode from *A. cinerea*, *H. himantopus* and *C. leucura* in a fish farm in Babylon province.

Diplophallus polymorphus of the present study was recorded from the intestine of *H. himantopus* with an incidence of 9.3% and an intensity of 1.3. Its first report in Iraq was by Al-Hadithi (1992) from the same host in Basrah.

Nematoda

Capillaria sp. of the present study was recorded from the proventriculus of both *F. atra* and *L. argentatus* with incidences of 12.8% and 14%, respectively and intensities of 1.1 and 1, respectively. The first report of *Capillaria* species from Iraqi birds was by Al-Aloosi (1985) who reported both *C. contorta* and *C. laricola* from *L. ridibundus* in Baiji and Al-Baghdadi regions. Mhaisen and Abul-Eis (1992) reported *C. contorta* from both *L. genei* and *L. ichthyaetus* in a fish farm in Babylon province. Reports of other *Capillaria* spp. included those of Abdullah (1980) from *F. atra* in Basrah, Al-Hadithi and Mustafa (1991) from *L. ridibundus* in Basrah and Awad *et al.* (1994) from *C. leucura* in Basrah. So, *L. argentatus* of the present study represents a new host record for *Capillaria* sp. in Iraq.

Eustrongylides tubifex of the present study was recorded from the proventriculus of *T. ruficollis* with an incidence of 12.7% and an intensity of 1.7. Its first report in Iraq was from

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the same host in Basrah (Al-Mayah, 1990). Al-Mayah and Mustafa (1994) also reported this species from the same host in Basrah.

Contracaecum spp. of the present study were recorded from the proventriculus of six species of aquatic birds: *E. alba*, *E. garzetta*, *A. ralloides*, *B. stellaris*, *A. purpurea*, and *C. rudis* with incidences of 14.5%, 15.6%, 20%, 13.1%, 16.7% and 3.4%, respectively and intensities of 1.1, 1.2, 1, 1.2, 1.3 and 1.3, respectively. The first report of adult *Contracaecum* sp. in Iraq was that of Al-Hadithi and Habish (1977), viz *C. microcephalum* from *A. purpurea* in Basrah. Al-Hadithi and Abdullah (1991) reported *C. ovale* from the same bird in Basrah. Awad *et al.* (1994) reported *Contracaecum* sp. from *A. purpurea*, *E. garzetta*, *Phalacrocorax pygmaeus* and *Platylea leucordia* in Basrah. Abed (2005) reported *Contracaecum* spp. from *Phalacrocorax carbo sinensis* in Basrah and Babylon provinces. Ali (2008) reported three species of *Contracaecum* from Basrah: *C. microcephalum* from *B. stellaris*, *E. garzetta* and *A. ralloides*; *C. micropapillatum* from both *A. cinerea* and *B. stellaris* and *C. ovale* from *B. stellaris*. So, the present investigation represents *E. alba*, *A. ralloides*, *B. stellaris* and *C. rudis* as four new host records for *Contracaecum* spp. in Iraq.

Tetrameres sp. of the present study was recorded from the proventriculus of *F. atra* with an incidence of 18.5% and an intensity of 1.1. The first report of *Tetrameres* sp. in Iraq was by Abdullah (1988) from *P. porphyrio*, *F. atra* and *G. chloropus* in Basrah. It was also reported from both *A. strepera* and *A. querquedula* in Basrah by Al-Mayah (1990). Mizhir (2002) reported *Tetrameres* sp. from *Aythya ferina* from Bahr Al-Najaf depression. It is relevant to indicate here that Yamaguti (1961) had considered the genus *Tetrameres* as a synonym of *Tropisurus*. However, the name *Tetrameres* was used and still in use as a valid genus by different researchers (Abdullah, 1988; Al-Mayah, 1990; Abdullah and Al-Hadithi, 1992; Al-Hadithi and Abdullah, 1992; Awad *et al.*, 1993; Mizhir, 2002).

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مجموعة الديدان المتطفلة على الطيور المائية في منخفض بحر النجف، وسط العراق

هيثم محمد حمادي العوادي* فرحان ضمد محيسن** فاضل فرهود
الجبوري***

* قسم علوم الحياة، كلية التربية، جامعة الكوفة، النجف الأشرف، العراق
** قسم علوم الحياة، كلية التربية (إبن الهيثم)، جامعة بغداد، بغداد، العراق
*** فرع الأنسجة والأجنة، كلية الطب، جامعة بابل، الحلة، العراق

الخلاصة

على مدى عامين، من شهر كانون الثاني ١٩٩٥ وحتى كانون الأول ١٩٩٦، نفذ مسح للديدان المتطفلة على الطيور المائية في منخفض بحر النجف، وسط العراق. تم صيد ٦٦٣ طائرا عاندا إلى ١١ نوعا وفحصها بحثا عن الديدان المتطفلة. كانت هذه الطيور مصابة بسبعة أنواع من المخرّمات هي:

Echinostoma mutabile و *Cyclocoelum mutabile* و *Notocotylus gibbus* و *Psilochasmus chloropodis* و *Patagifer parvispinosus*

وسبعة أنواع من الديدان الشريطية هي:

oxyurus و *Diplostomum spathaceum* و *Apharyngostrigea cornu* و *D. inflatus* و *D. Paricterotaenia porosa* و *Dicranotaenia tsengi* و *Diorchis brevis* و *T. decacantha* و *Tatria acanthorhyncha* و *Diplophallus polymorphus*

وأربعة أنواع من الديدان الخيطية وهي:

Contraecaecum sp. و *Eustrongylides tubifex* و *Capillaria* sp. و *Tetrameres* sp.

سجلت خمسة أنواع من هذه الطيور المائية مضيفات جديدة لأربعة أنواع من الديدان في الدراسة الحالية.