

PARASITIC FAUNA OF FISHES IN BAHR AL-NAJAF DEPRESSION,
MID IRAQ

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ABSTRACT

During a period of two years, from January 1995 till December 1996, the first survey on fish parasites in Bahr Al-Najaf depression, mid Iraq, was achieved. A total of 6992 fishes, belonging to 11 species, were collected and inspected for external and internal parasites. These fishes were infected with three protozoans (*Ichthyophthirius multifiliis*, *Trichodina domerguei* and *Myxobolus pfeifferi*), two monogeneans (*Dactylogyrus cornu* and *Gyrodactylus elegans*), two digenetic trematodes (*Clinostomum complanatum* and *Ascocotyle coleostoma*), one nematode (*Contracaecum* sp.) and one acanthocephalan (*Neoechinorhynchus iraqensis*). Five fish species were recorded as new hosts in Iraq for four helminth species of the present study.

INTRODUCTION

During the last 25 years or so, marine fishing in Iraq was ceased due to the war circumstances. Also, fish culture industry was decreased due to the economic blockade. Hence, hopes were focused on inland fisheries.

Whole- year surveys on parasites of fishes in different parts of inland waters of Iraq are numerous (Mhaisen, 2009). Some surveys covered one or more major groups of parasites. Some were restricted to one or more fish species. Most of such surveys were done on fishes from different localities of Iraqi rivers. Among such surveys, works concerned with more than one major group of parasites and more than one fish species from inland waters of Iraq (other than rivers) will be mentioned here. These included those of Al-Daraji (1986) in Al-Hammar marshes, Al-Saadi (1986) in Al-Tharthar lake, Al-Alusi (1989), Asmar *et al.* (1999) and Balasem *et al.* (2003) in Al-Qadisiya dam lake, Abdullah (1990) in Dokan lake, Mhaisen *et al.* (1999) in Al-Habbaniya lake, Balasem *et al.* (2000) in Hemrin dam lake, Mhaisen *et al.* (2003) in Al-Madaen drainage network and Abdullah (2005) in Darbandikhan lake.

From the above information, it is clear that no study was done on the parasitic fauna of fishes in Bahr Al-Najaf depression. Therefore, the present investigation was focused on this area as the detailed knowledge of the parasitic fauna is necessary for any attempt to improve the stocks of valuable commercial fisheries in inland waters (Shul'man, 1961).

MATERIALS AND METHODS

Bahr Al-Najaf depression (the sampling area of the present study) lies southwest of Al-Najaf Al-Ashraf city. This area 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 into Bahr Al-Najaf depression. This depression also receives drainage waters from the southern cultivated area. Springs in the region are considered as another source of water in this depression (personal communication with Al-Najaf Irrigation and Agrarian Directorate). This depression includes a terrestrial habitat and an aquatic habitat.

Fish specimens were collected during the period from January 1995 till December 1996. They were caught with the aid of a small cast net and a hand net. Fishes were directly transported to the laboratory where they were measured, weighed and sexed. Coad's (1991) list was followed for the scientific names of fishes.

Skin and gill smears, eye lenses, body cavity, musculature and all internal organs were inspected according to Amlacher (1970). Mhaisen's (2009) index-catalogue of parasites and disease agents of fishes of Iraq was followed to indicate the number of previous host records for each parasite species in order to minimize number of references for each parasite. Percentage incidence of infection was calculated as defined by Margolis *et al.* (1982). Parasite identification was done according to Bykhovskaya-Pavlovskaya *et al.* (1962) and Amin *et al.* (2001).

RESULTS AND DISCUSSION

During the two years period of the present study, 6992 fishes were captured. These belong to seven families and 11 species as demonstrated below with their numbers:-

- Family Cyprinidae
 - 253 *Barbus grypus* Heckel, 1843
 - 322 *Barbus luteus* (Heckel, 1843)
 - 155 *Barbus sharpeyi* Günther, 1874
 - 197 *Barbus xanthopterus* (Heckel, 1843)
 - 82 *Carassius carassius* (Linnaeus, 1758)
- Family Bagridae
 - 88 *Mystus pelusius* (Solander in Russell, 1794)
- Family Siluridae
 - 65 *Silurus triostegus* Heckel, 1843
- Family Heteropneustidae
 - 113 *Heteropneustes fossilis* (Bloch, 1794)
- Family Cyprinodontidae
 - 2158 *Aphanius dispar* (Rüppell, 1828)
- Family Poeciliidae
 - 701 *Gambusia affinis* (Baird *et* Girard, 1853)
- Family Mugilidae
 - 2858 *Liza abu* (Heckel, 1843)

Nine parasite species were detected in the present investigation. Table (1) shows a list of the recorded parasites (phylogenetically arranged) and their hosts together with their percentage incidence of infection and site of infection. The following is a brief account on the occurrence of these parasites.

Table (1): Parasite- fish host list in Bahr Al-Najaf depression.

Parasite species	Fish host	% Incidence	Site of infection *
<i>Ichthyophthirius multifiliis</i>	<i>Barbus luteus</i>	13	G
	<i>Barbus sharpeyi</i>	12	G
	<i>Heteropneustes fossilis</i>	9	G
	<i>Mystus pelusius</i>	15	G
	<i>Liza abu</i>	22	G
<i>Trichodina domerguei</i>	<i>Barbus sharpeyi</i>	11	S, G
	<i>Heteropneustes fossilis</i>	15	S, G
	<i>Liza abu</i>	8	S, G
<i>Myxobolus pfeifferi</i>	<i>Barbus luteus</i>	15	S, G
	<i>Liza abu</i>	17	S, G
<i>Dactylogyrus cornu</i>	<i>Barbus luteus</i>	12	G
	<i>Liza abu</i>	13	G
<i>Gyrodactylus elegans</i>	<i>Barbus luteus</i> **	13	S
	<i>Heteropneustes fossilis</i>	10	S
	<i>Liza abu</i>	7	S
<i>Ascocotyle coleostoma</i>	<i>Heteropneustes fossilis</i>	13	S
<i>Clinostomum complanatum</i>	<i>Aphanius dispar</i>	12	S
	<i>Barbus luteus</i>	12	S
	<i>Gambusia affinis</i>	15	S
	<i>Heteropneustes fossilis</i>	17	S
	<i>Liza abu</i> **	11	S
<i>Contracaecum</i> sp.	<i>Aphanius dispar</i> **	52.6	K, L, M
	<i>Barbus grypus</i>	15	K, L, M
	<i>Gambusia affinis</i> **	12	BC
	<i>Liza abu</i>	62.2	I, K, L, M, Sp
<i>Neoechinorhynchus iraqensis</i>	<i>Barbus xanthopterus</i> **	9	I
	<i>Liza abu</i>	39.8	I

* Site of infection: BC= body cavity, G= gills, I= intestine, K= kidneys, L= liver, M= mesenteries, S= skin, Sp= spleen.

** New host record in Iraq

Protozoa – Ciliophora

Two ciliated protozoans (*Ichthyophthirius multifiliis* and *Trichodina domerguei*) were recorded in the present study (Table 1).

Ichthyophthirius multifiliis was recorded from gills of five fish species of the present study (*B. luteus*, *B. sharpeyi*, *H. fossilis*, *M. pelusius* and *L. abu*. Herzog (1969) recorded *I. multifiliis* for the first time in Iraq from *Mugil dussumieri* in Tigris river at Baghdad city. According to

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Mhaisen (2009), a total of 28 fish host species are so far known for this parasite in Iraq, inclusive of the five fish species of the present study. This parasite is a dangerous pathogen, especially under intensive fish culture as it causes the white spot disease (Duijn, 1973).

Trichodina domerguei of the present study was recorded from skin and gills of three fish species (*B. sharpeyi*, *H. fossilis* and *L. abu*). Its first record from Iraq was by Shamsuddin *et al.* (1971) from eight fish species (*B. esocinus*, *B. grypus*, *B. luteus*, *B. sharpeyi*, *B. xanthopterus*, *Cyprinus carpio*, *L. abu* and *S. triostegus*) taken from different fish markets in Baghdad city. Now, it has 33 fish hosts in Iraq inclusive of the three species of the present study (Mhaisen, 2009). According to Amlacher (1970), this parasite exerts little pathological effects on its host. However, Rogers and Gaines (1975) claimed that trichodiniasis is oftenly associated with other parasitic infections, and hence it is difficult to determine the actual cause of the disease.

Protozoa – Myxozoa

Only one species (*Myxobolus pfeifferi*) was recorded from the skin and gills of both *B. luteus* and *L. abu* of the present study. This parasite was recorded for the first time in Iraq by Fattohy (1975) from *Acanthobrama marmid* in Tigris river at Mosul city. This is a common parasite in different parts of Iraq as it has, so far, 33 host species (Mhaisen, 2009). This parasite is known to attack different fish organs (Amlacher, 1970; Duijn, 1973). Mhaisen *et al.* (1989) demonstrated different degrees of petrification and degeneration of *L. abu* ovaries in a fish farm in Babylon province due to this parasite.

Monogenea

Two species of monogenetic trematodes were recorded in the present study. These were *Dactylogyru cornu* and *Gyrodactylus elegans* (Table 1).

Dactylogyru cornu was recorded from gills of both *B. luteus* and *L. abu* of the present study. Its first record in Iraq was by Ali *et al.* (1986a) from six fish species (*B. belayewi*, *B. grypus*, *B. luteus*, *B. xanthopterus*, *Chondrostoma regium* and *S. triostegus*) in Diyala river. Six more hosts were then reported for this parasite in Iraq (Mhaisen, 2009) inclusive of *L. abu* of the present study.

Gyrodactylus elegans of the present study was recorded from the skin of three fish species (*B. luteus*, *H. fossilis* and *L. abu*). Its first record in Iraq was by Ali and Shaaban (1984) from *C. carpio* and *L. abu* in Al-Zaafaraniya fish farm, south of Baghdad. So far, it has 22 fish hosts in Iraq, inclusive of *B. luteus* of the present study, which represents a new host record (Mhaisen, 2009). It is necessary to mention here that Asmar *et al.* (1999), Mohammad-Ali *et al.* (1999), Al-Nasiri (2000), Salih *et al.* (2000) and Al-Awadi (2003) had reported this parasite from *B. luteus* before the publication of the present paper.

Trematoda

Metacercariae of two species of digenetic trematodes were recorded in the present study. These were *Ascocotyle coleostoma* and *Clinostomum complanatum* (Table 1).

Metacercariae of *A. coleostoma* of the present study were recorded from the skin of *H. fossilis*. These metacercariae were reported for the first time in Iraq by Ali *et al.* (1986b) from *H. fossilis* in Diyala river. So far, this species was reported from 22 fish hosts in Iraq (Mhaisen, 2009). The adult worm was detected from the intestine of the grey heron, *Ardea cinerea* in Babylon fish farm (now Euphrates fish farm) near Hilla city (Mhaisen and Abul-Eis, 1992).

Metacercariae of *C. complanatum* of the present study were recorded from the skin of five fish species (*A. dispar*, *B. luteus*, *G. affinis*, *H. fossilis* and *L. abu*). These metacercariae were recorded for the first time in Iraq by Khamees (1983) from *Aspius vorax* and *B. luteus* in Mehajeran creek, south of Basrah. A total of 16 fish hosts are, so far, known to harbor this

species in Iraq including *A. dispar*, *H. fossilis* and *G. affinis* (Mhaisen, 2009). So, *L. abu* of the present study represents a new host record for *C. complanatum* in Iraq. It is adequate to indicate here that Jori (1998), Abdul-Rahman (1999), Al-Niaem (2006) and Al-Saadi (2007) had reported this species from *L. abu* before the publication of the present paper. *C. complanatum* infects the skin, gills and muscles of freshwater fishes and causes the yellow grub disease (Amlacher, 1970). The adult worm lives in the mouth and pharynx of piscivorous birds such as herons and bitterns (Duijn, 1973).

Nemathelminthes

The third larval stages of the nematode *Contraecaecum* spp. were found encysted in kidneys, liver and mesenteries of both *A. dispar* and *B. grypus*, in the body cavity of *G. affinis* and in the intestine, kidneys, liver, mesenteries and spleen of *L. abu* (Table 1). These larvae were reported for the first time in Iraq by Herzog (1969) from 10 species of fishes in different parts of Iraq (*A. vorax*, *B. esocinus*, *B. grypus*, *B. luteus*, *B. sharpeyi*, *B. xanthopterus*, *H. fossilis*, *L. abu*, *M. pelusius* and *S. triostegus*). This is the commonest fish helminth parasite in inland waters of Iraq as its host list consists of 35 species including the two new records of the present study (*A. dispar* and *G. affinis*) according to Mhaisen (2009). The final hosts for *Contraecaecum* spp. in Iraq are some aquatic birds (Shamsuddin *et al.*, 1971; Al-Hadithi and Habish, 1977; Al-Hadithi and Abdullah, 1991; Awad *et al.*, 1994; Al-Awadi, 1997).

Acanthocephala

One species of spiny-headed worms (*Neoechinorhynchus iraqensis*) was recorded from the intestine of both *B. xanthopterus* and *L. abu*. According to Mhaisen (2002), this species was erroneously identified as *N. agilis* in most Iraqi literature prior to the nomination of *N. iraqensis* by Amin *et al.* (2001). The first record of *N. agilis* (as a synonym of *N. iraqensis* in Iraqi literature) was by Habash and Daoud (1979) from *Mugil hishni* (a synonym of *L. abu*) in Shatt Al-Arab river. Now, the host list of *N. iraqensis* (together with *N. agilis*) comprises 17 fish species inclusive of *B. xanthopterus*, which represents a new host record for *N. iraqensis* in Iraq (Mhaisen, 2009). No more reports are available on the occurrence of *N. iraqensis* in *B. xanthopterus* in Iraq. In intensive infection, *N. iraqensis* is known to cause intestinal blockage as indicated by Khamees (1983) for *L. abu* in Mehajjeran creek, south of Basrah.

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المجموعة الحيوانية المتطفلة على الأسماك في منخفض بحر النجف، وسط العراق

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الخلاصة

على مدى عامين من شهر كانون الثاني 1995 وحتى كانون الأول 1996، نفذ أول مسح لطفيليات الأسماك في منخفض بحر النجف، وسط العراق. جمعت 6992 سمكة تعود إلى 11 نوعاً وفحصت بحثاً عن الطفيليات الخارجية والداخلية. كانت هذه الأسماك مصابة بثلاثة أنواع من الحيوانات الإبتدائية (*Ichthyophthirius multifiliis*)، (*Trichodina domerguei* و *Myxobolus pfeifferi*) ونوعين من المخزّات أحادية المنشأ (*Gyrodactylus elegans* و *Dactylogyrus cornu*) ونوعين من المخزّات ثنائية المنشأ (*Ascocotyle coleostoma* و *Clinostomum complanatum*) ونوع واحد من الديدان الخيطية (*Contracaecum* sp.) ونوع واحد من الديدان شوكية الرأس (*Neoechinorhynchus iraqensis*). سجلت خمسة أنواع من الأسماك مضيفات جديدة في العراق لأربعة أنواع من الديدان في الدراسة الحالية.