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 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.
Parasitic Fauna of Fishes

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 xanhopterus* (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.

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

* 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
Parasitic Fauna of Fishes

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 *Asocotyle coleostoma* and *Clinostomum complanatum* (Table 1).

*Asocotyle 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 *Clinostomum 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 Mehajjeran 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-Niaeem (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 *Contracaecum* 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 *Contracaecum* 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 Mehaijeran creek, south of Basrah.

**LITERATURE CITED**
Parasitic Fauna of Fishes


Al-Awadi et al.


Parasitic Fauna of Fishes


المجموعة الوراثية المتقلبة 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 سفينة تعود إلى 11 نوعا وفحصت بعناية عن الطفيليات الخارجية Ichthyophthirius multifiliis والداخلية. كانت هذه الأحور اصابة تشمل أنواع من الحيوانات الإيدينالبية (Myxobolus pfeifferi, Trichodina domerguei) ونوعين من المخزومات أحادية المنها (Gyrodactylus elegans, Dactylogyulus cornu) ونوع واحد من الدودان المخاطية (Ascocotyle coleostoma, Clinostomum complanatum) ونوع واحد من الدودان شكلية الرأس (Contracaecum sp.).

سجلت خمسة أنواع من الأسماك مضيقات جديدة في العراق لأربع أنواع من الدودان في الدراسة الحالية.