OCCURRENCE OF SOME FISH PARASITES IN AL-MADAEN DRAINAGE NETWORK, SOUTH OF BAGHDAD


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ABSTRACT
Seven fish species were collected from the drainage network at Al-Madaen region, south of Baghdad with the aid of a cast net during the period from March to August 1993. These fishes were infected with 22 parasite species (seven sporozoans, three ciliated protozoans, seven monogeneans, two nematodes, one acanthocephalan and two crustaceans) and one fungus species. Among such parasites, Chloromyxum wardi and Cystidicola sp. are reported here for the first time in Iraq. In addition, 11 new host records are added to the list of parasites of fishes of Iraq.

INTRODUCTION
Many small-sized private sector fish farms are scattered in the area of Al-Madaen, south of Baghdad. Also, fields of crops, cattle and poultry farms as well as some food processing pilots and allied factories are distributed there. Water inflow comes either from Tigris river or the lower reaches of Diyala river.
Through practicing field trips to some of the fish farms at Al-Madaen area, many wild fishes (notably Liza abu) were noticed in such farms. Also, many fish specimens were found in the nearby drainage network. Due to some administrative faults, escape of cultured fishes with the outlet water and entrance of some wild fishes through the inlet or even outlet water may occur especially with the absence of reliable fine-meshed screens at the inlets and outlets of such farms (Mhaisen, 1996). Such events result in parasite exchange which may affect health of cultured fishes (Mhaisen, 1993).
Only three works were done on the parasitic fauna of fishes found in the Main Drainage system of mid Iraq (Balasem et al., 2002a, b; Asmar et al., 2003). As no previous account was available on the parasitic fauna of fishes in the drainage network of Al-Madaen region except few remarks given by Asmar et al. (2003), the present study was conducted to gain basic information on this topic due to its importance in the control of fish parasites on one side and human health on the other side as more people are often seen fishing in this area.

MATERIALS AND METHODS
During the period from March to August 1993, fish specimens were collected from the drainage network system at Al-Madaen, south of Baghdad. Cast nets of different mesh sizes were used to capture these fishes.
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Fishes were transported alive to the laboratory where they were examined for parasites. Skin and gill smears, eye lenses, body cavity, musculature and all internal organs were examined according to Amlacher (1970). The index-catalogue of parasites and disease agents of fishes of Iraq (Mhaisen, 2003 in press) was followed to indicate number of previous host records for each parasite in order to minimize number of references for each parasite species.

RESULTS AND DISCUSSION

A total of 75 fish specimens belonging to seven fish species were collected from the sampling area of Al-Madaen drainage network. These fishes included one Alburnus caeruleus, one Barbus grypus, eight B. luteus, one Carassius carassius, one Chondrostoma regium, two Cyprinus carpio and 61 Liza abu.

Twenty-two parasite species and one fungus were recorded from these fishes. The following is a brief account on the occurrence of these parasites and fungus which are arranged here according to their major classification groups (Table 1).

Protozoa- Sporozoa

Seven sporozoans belonging to three genera (Chloromyxum, Myxidium and Myxobolus) were recorded in the present study.

*Chloromyxum wardi* (Fig. 1):

*Chloromyxum wardi* of the present investigation was recorded from kidneys of two *L. abu*. This is the first report on *Chloromyxum* from fishes of Iraq. So, the followings are some details on its description.

Sphaerosporidae. Spores spherical with somewhat narrow anterior pole. Suture line projects in form of wall. Spore valves with ridges. Four pyriform polar capsules present at apex of spore.

The present specimens are much identical with *C. wardi* Kudo, 1919 as explained by Shul'man (1966) who gave the following measurements for *C. wardi*. Vegetative form (plasmodium) 18-38 micrometer. Spore diameter 7.5-10.5 micrometer, larger polar capsules 4-5.2 x 3.6 micrometer and smaller polar capsules 3-4 x 3.2 micrometer. According to Hoffman (1998), a total of 17 *Chloromyxum* species are known in freshwater fishes of North America. Shul'man (1966) reported 31 *Chloromyxum* species from the former Soviet Union. *Chloromyxum* parasites are coelozoic (rarely histozoic) in freshwater and marine fishes and exceptionally in amphibians (Hoffman, 1998).

*Myxidium pfeifferi* was detected from the gall bladder of one *B. luteus* in the present study. This fish is considered now as the third host for *M. pfeifferi* in Iraq (Mhaisen, 2003 in press).

*Myxobolus dispar* of the present investigation was recorded from the spleen of one *B. luteus* and kidneys of one *L. abu*. Now, *B. luteus* represents the twelfth host record for *M. dispar* in Iraq (Mhaisen, 2003 in press). Three reports (Al-Nasiri, 2000; Balasem et al., 2002b; Asmar et al., 2003) were documented before the publication of the present study.

*Myxobolus dogieli* was recorded from the gills of one *L. abu* of the present study. It has eight hosts in Iraq (Mhaisen, 2003 in press) inclusive of *L. abu* which was known as the first host for *M. dogieli* in Iraq (Abdel-Ameer, 1989).

*Myxobolus nemachili* was recorded from the kidneys of one *B. luteus* of the present study. *B. luteus* now adds a new host for the previous seven hosts in Iraq for this parasite (Mhaisen, 2003 in press). However, later reports on the occurrence of *M. oviformis* from *C. carassius* (Abdul-Rahman, 1999; Mohammad-Ali et al., 1999) were published before the present paper.
Myxobolus pfeifferi was found in different organs of three B. luteus and six L. abu (Table 1). This parasite is very common in freshwater fishes of Iraq as its host list consists of 33 species (Mhaisen, 2003, in press) including the two species of the present study.

Protozoa- Ciliata

Three species of ciliates belonging to three genera (Chilodonella, Ichthyophthirius and Trichodina) were recorded in the present study.

Chilodonella cyprini of the present investigation was recorded from the gills of two L. abu. This parasite was reported earlier from this fish from Diyala river (Al-Shaikh et al., 1995). So far it has six hosts in Iraq inclusive of L. abu of the present study (Mhaisen, 2003, in press).

Ichthyophthirius multifiliis of the present study was recorded from the gills of one L. abu. Its first report from this fish was from Mosul (Fatthohy, 1975). So far, it has 23 fish hosts in Iraq inclusive of the present host (Mhaisen, 2003, in press). It is a dangerous parasite as it causes the white spot disease (Duijn, 1973).

Trichodina domerguei was recorded in the present study from the skin and gills of two B. luteus as well as from the gills of one C. carassius, two C. carpio and two L. abu. Among these fish species, C. carassius now represents a new host for T. domerguei to be added to the previous 27 hosts in Iraq (Mhaisen, 2003, in press). However, later reports on the occurrence of T. domerguei from C. carassius (Mhaisen et al., 1999; Mohammad-Ali et al., 1999; Salih et al., 2000; Asmar et al., 2003, in press) were published before the present article.

Trematoda

Seven trematode species were recorded in the present study (Table 1). These included five monogeneans (Dactylogyrus vastator, Diplozoon kasimii, Discocotyle sagittata, Gyrodactylus elegans and Microcotyle donavini) and two digeneans (Ascocotyle coleostoma and Diplostomum sp.).

D. vastator of the present study was recorded from the gills of five B. luteus, one C. carassius and one C. carpio (Table 1). C. carassius is considered now as host number 29 for this parasite in Iraq (Mhaisen, 2003, in press). However, Abdul-Rahman (1999) and Mohammad-Ali et al. (1999) recorded this parasite from C. carassius before the publication of the present investigation.

The twin fluke, Diplozoon kasimii, was recorded on the gills of A. caeruleus. This fish now represents a new host for D. kasimii to be added to Occurrence of some fish parasites

the previous 11 host species (Mhaisen, 2003, in press). It is necessary to mention here that Asmar et al. (2003) reported D. kasimii from A. caeruleus before the publication of the present paper.

The polypopisthocotyle Discocotyle sagittata was recorded on the gills of 16 L. abu of the present study. This represents its first occurrence in Iraq. A detailed account on occurrence of this parasite as well as four other monogeneans was given before the publication of this paper by Mhaisen et al. (2003, in press).

Gyrodactylus elegans of the present article was recorded on the gills of one C. carassius, two C. carpio and skin and gills of seven L. abu. Previously, this parasite was reported from 20 fish host species in Iraq exclusive of C. carassius (Mhaisen, 2003, in press). So, C. carassius now represents a new host for this parasite in Iraq.

Microcotyle donavini was recorded from the gills of two L. abu of the present study. Previously, this parasite was reported from ten host species including L. abu from fish farms and inland waters in Iraq (Mhaisen, 2003, in press).

Metacercariae of the digenetic trematode Ascocotyle coleostoma were found on the skin and gills of two L. abu of the present study. A total of 23 fish host species are so far known.
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for this parasite in Iraq including *L. abu* (Mhaisen, 2003, in press). Adults of this parasite infect some wild aquatic birds (Hoffman, 1998).

Metacercariae of the digenetic trematode *Diplostomum* sp. were found in the eye lenses of one fish each of three species (*A. caeruleus, B. luteus* and *C. carpio*). Mhaisen (2003, in press) gave a detailed account on the occurrence of *Diplostomum* spp. in freshwater fishes of Iraq. He showed that 28 fish host species are known for seven species of *Diplostomum* as well as 17 fish host species for unidentified species of this genus. Adults of *Diplostomum* are known in some piscivorous aquatic birds in some inland waters of Iraq (Mhaisen *et al.*, 1990; Al-Awadi, 1997).

**Nemathelminthes**

Two phasmid nematodes were recorded during the present study (Table 1). *Cucullanus pseudoeutropi* was recorded from the intestine of one *L. abu* which represents a new host record to be added to the two previous host records of this parasite in Iraq (Mhaisen, 2003, in press).

The other spirurid phasmid nematode (*Cystidicola* sp.) was found in the intestine of one *L. abu*. This is the first occurrence of *Cystidicola* in fishes of Iraq. Therefore, a detailed account will be given here to cover its description.

**Cystidicola sp. (Fig. 2):**

*Cystidicolidae*. Pseudolabia small; oral opening dumbbell shaped, armed with two rows of teeth. Buccal cavity long and slender; oesophagus divided into short, anterior muscular and long posterior glandular oesophagi. Vulva slightly anterior to middle of body. Tail of the female straight, short and blunt. Fully-developed eggs bearing filaments. The present worm is similar to *C. farionis* Fischer, 1798 as explained by Yamaguti (1961). However, this is not quite certain due to the absence of males of this worm in the present study.

**Acanthocephala**

Only one thorny-headed worm (*Neoechinorhynchus iraqensis*) was recorded from the intestine of 26 *L. abu*. According to Mhaisen (2002), this parasite was erroneously identified as the marine *N. agilis* and all *N. agilis* records from fishes of Iraq should be referred to *N. iraqensis*. Therefore, *N. iraqensis* (and *N. agilis* in the Iraqi literature) has so far 16 fish host species inclusive of *L. abu* (Mhaisen, 2003, in press).

**Crustacea**

Two copepod crustaceans were recorded during the present investigation (Table 1). *Ergasilus sieboldi* was recorded from the gills of 13 *L. abu*. This crustacean has 18 fish host species in Iraq including *L. abu* of the present study (Mhaisen, 2003, in press).

The fifth copepodal stage of the anchor worm *Lernaea cyprinacea* was recorded on the gills of 13 *L. abu*. This parasite infects mainly cultured cyprinid fishes. However, it was so far reported from 24 fish host species from many fish farms as well as from many inland water bodies in Iraq (Mhaisen, 2003, in press).

**Fungi**

Only one fungus (*Ichthyophon hoferi*) was recorded in different organs of 22 *L. abu* (Table 1). So far, this fungus is known from 19 fish host species including *L. abu* in Iraq (Mhaisen, 2003, in press).

To sum up on the results of the present survey, it is clear that *L. abu* harboured 17 parasitic and fungus species (Table 1). This fish (with its highest parasitic fauna) represents a real
threat to farm fishes as it can enter fish farms even through outlet water via the drainage network and hence can carry some parasites to farm fishes. This condition agreed with a conclusion reached by Mhaisen (1993) while reviewing the role of wild fishes in fish farms of Iraq. He stated that *L. abu* harboured 12 out of 13 parasite and fungus species recorded in wild fishes in fish farms and ponds of Iraq. The other wild fish, *B. luteus* of the present study harboured eight parasite species (the second rank of importance). Finally, none of the parasites recorded in the present study has any importance from zoonotical point of view and hence such fishes found in the studied drainage network have no adverse effect on human health in this respect.

Table (1): Parasite and fungus species of some fishes from Al-Madaen drainage network, south of Baghdad.

<table>
<thead>
<tr>
<th>Parasite group and species</th>
<th>Host species</th>
<th>Site of infection*</th>
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<tbody>
<tr>
<td>PROTOZOA - SPOROZOA</td>
<td></td>
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<tr>
<td><em>Chloromyxum wardi</em></td>
<td><em>L. abu</em></td>
<td>K</td>
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<tr>
<td><em>Myxidium pfeifferi</em></td>
<td><em>B. luteus</em></td>
<td>Gb</td>
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<tr>
<td><em>Myxobolus dispar</em></td>
<td><em>B. luteus</em></td>
<td>Sp</td>
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<td><em>Myxobolus dogieli</em></td>
<td><em>L. abu</em></td>
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<td><em>Myxobolus nemachili</em></td>
<td><em>B. luteus</em></td>
<td>K</td>
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<tr>
<td><em>Myxobolus oviformis</em></td>
<td><em>B. luteus</em></td>
<td>G, L, K, Go</td>
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<td></td>
<td><em>C. carassius</em></td>
<td>H</td>
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<tr>
<td><em>Myxobolus pfeifferi</em></td>
<td><em>B. luteus</em></td>
<td>G, K, L, Gb, Go</td>
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<td></td>
<td><em>L. abu</em></td>
<td>Gb, H, K, L</td>
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<td>PROTOZOA - CILIATA</td>
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<tr>
<td><em>Chilodonella cyprini</em></td>
<td><em>L. abu</em></td>
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<td><em>Ichthyophthirius multiiliis</em></td>
<td><em>L. abu</em></td>
<td>G</td>
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<td><em>Trichodina domergaei</em></td>
<td><em>B. luteus</em></td>
<td>S, G</td>
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<td><em>C. carassius</em></td>
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<td></td>
<td><em>C. carpio</em></td>
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<td>TREMATODA</td>
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<td><em>Ascocotyle coleostoma</em></td>
<td><em>L. abu</em></td>
<td>S, G</td>
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<td><em>C. carassius</em></td>
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<td><em>C. carpio</em></td>
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<td><em>Diplostomum sp.</em></td>
<td><em>A. caeruleus</em></td>
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<td><em>B. luteus</em></td>
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<td><em>C. carpio</em></td>
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<td><em>Diplozoon kasimii</em></td>
<td><em>A. caeruleus</em></td>
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<td><em>Discocotyle sagittata</em></td>
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<td><em>C. carpio</em></td>
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<td><em>Microcotyle donavini</em></td>
<td><em>L. abu</em></td>
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<table>
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<tr>
<th>NEMATHELMINTHES</th>
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<tr>
<td>Cucullanus pseudeutropi</td>
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<td>Neoechinorhynchus iraqensis</td>
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<td>Ergasilus sieboldi</td>
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<td>Lernaea cyprinacea</td>
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<th>FUNGI</th>
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<tr>
<td>Ichthyophonus hoferi</td>
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G, S, L, Sp, K, H, Gb, I + Site of infection: E= eyes, G= gills, Gb= gall bladder, Go= gonads, H= heart, I= intestine, K= kidneys, L= liver, S= skin, Sp= spleen
+ New host record in Iraq.
++ New parasite record in Iraq.

LITERATURE CITED


F.T. Mhaisen et al.


Occurrence of some fish parasites


في جنوب بغداد، ظهور بعض طفيليات الأسماك في شبكة مبازل المدان.

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**

الخلاصة

بع وتسمية أنواع من الأسماك من شبكة المبازل في منطقة المدان، جنوب بغداد خلال المدة من شهر آب وحتى أكتوبر 1993، كانت هذه الأسماك مصابة بأربعة عشرة ثلاثة طفيليات، سبعة بوعيات حيوانية، ثلاثة متجائلات، سبعة معدات، نوع واحد من الدودة، نوع واحد من الفطر، نوع واحد من الفيروسات. من بين هذه الـ 22 نوعًا من الفيروسات تم تسجيل كل منها لأول مرة من العراق، وفضلًا عن ذلك فقد أضيف لقائمة طفيليات أسماك العراق 11 نوعًا من المضيفات الجديدة.

Cystidicola sp. و Chloromyxum wardi
Fig. (1): Different views of *Chloromyxum wardi* spores (from Shul'man, 1966).

Fig. (2): *Cystidicola* sp.
A: Anterior end of the female,
B: Posterior end of the female,
C: Egg (from Hoffman, 1998)