

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 (Abdul-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,

Myxobolus oviformis of the present investigation was recorded from different organs of three fish species (Table 1) including *C. carassius* as a new host to be added to the previous 19 host species in Iraq (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 (Fattohy, 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 polyopisthocotyle *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 pseudotropi 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 (*Ichthyophonus 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.

Parasite group and species	Host species	Site of infection*
PROTOZOA - SPOROZOA		
<i>Chloromyxum wardi</i> ++	<i>L. abu</i>	K
<i>Myxidium pfeifferi</i>	+ <i>B. luteus</i>	Gb
<i>Myxobolus dispar</i>	+ <i>B. luteus</i>	Sp
	<i>L. abu</i>	K
<i>Myxobolus dogieli</i>	<i>L. abu</i>	G
<i>Myxobolus nemachili</i>	+ <i>B. luteus</i>	K
<i>Myxobolus oviformis</i>	<i>B. luteus</i>	G, L, K, Go
	+ <i>C. carassius</i>	H
	<i>L. abu</i>	S, G, L, K, Sp, H, Gb
<i>Myxobolus pfeifferi</i>	<i>B. luteus</i>	G, K, L, Gb, Go
	<i>L. abu</i>	Gb, H, K, L
PROTOZOA - CILIATA		
<i>Chilodonella cyprini</i>	<i>L. abu</i>	G
<i>Ichthyophthirius multifiliis</i>	<i>L. abu</i>	G
<i>Trichodina domerguei</i>	<i>B. luteus</i>	S, G
	+ <i>C. carassius</i>	G
	<i>C. carpio</i>	G
	<i>L. abu</i>	G
TREMATODA		
<i>Ascocotyle coleostoma</i>	<i>L. abu</i>	S, G
<i>Dactylogyrus vastator</i>	<i>B. luteus</i>	G
	+ <i>C. carassius</i>	G
	<i>C. carpio</i>	G
<i>Diplostomum</i> sp.	<i>A. caeruleus</i>	E
	<i>B. luteus</i>	E
	<i>C. carpio</i>	E
<i>Diplozoon kasimii</i>	+ <i>A. caeruleus</i>	G
<i>Discocotyle sagittata</i>	+ <i>L. abu</i>	G
<i>Gyrodactylus elegans</i>	+ <i>C. carassius</i>	G
	<i>C. carpio</i>	G
	<i>L. abu</i>	S, G
<i>Microcotyle donavini</i>	<i>L. abu</i>	G

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NEMATHELMINTHES		
<i>Cucullanus pseudeutropi</i>	+ <i>L. abu</i>	I
<i>Cystidicola</i> sp. ++	<i>L. abu</i>	I
ACANTHOCEPHALA		
<i>Neoechinorhynchus iraqensis</i>	<i>L. abu</i>	I
CRUSTACEA		
<i>Ergasilus sieboldi</i>	<i>L. abu</i>	G
<i>Lernaea cyprinacea</i>	<i>C. carpio</i>	G
FUNGI		
<i>Ichthyophonus hofèri</i>	+ <i>L. abu</i>	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

- Abdul-Ameer, K.N. 1989. Study of the parasites of freshwater fishes from Tigris river in Salah Al-Dien province, Iraq. M. Sc. Thesis. Univ. Baghdad: 98pp. (In Arabic).
- Abdul-Rahman, N.M. 1999. Parasites infection in fish from Garmat Ali river and it's relation with food items. M. Sc. Thesis, Univ. Basrah: 103pp. (In Arabic).
- Al-Awadi, H.M.H. 1997. Some ecological aspects of the parasitic faunae of fishes and aquatic birds in Bahr Al-Najaf depression, Iraq. Ph. D. Thesis, Univ. Baghdad: 71pp.
- Al-Nasiri, F.S. 2000. Parasitic infections of fishes in a man-made lake at Al-Amiriya region, Baghdad. M. Sc. Thesis, Univ. Baghdad: 133pp. (In Arabic).
- Al-Shaikh, S.M.; Mhaisen, F.T.; Al-Khateeb, G.H.; Balasem, A.N. and Mansoor, N.T. 1995. Collection of some fish parasites from the lower reaches of Diyala river, mid Iraq. J. Environ. Sci. Health, A 30(8): 1707- 1715.
- Amlacher, E. 1970. Textbook of fish diseases (Engl. transl.). T.F.H. Publ., Jersey city: 302pp.
- Asmar, K.R.; Balasem, A.N.; Adday, T.K. and Al-Jawda, J.M. 2003. Parasitic infections in some lotic water systems in mid Iraq. Iraqi J. Agric., 8(6): 59-65. (In Arabic).
- Asmar, K.R.; Balasem, A.N.; Al-Jawda, J.M. and Adday, T.K. 2003. Recording of parasitic and fungal infections in three fish farms, south of Baghdad. Iraqi J. Aquacult., 2: 117- 132 in press (In Arabic).
- Balasem, A.N.; Mhaisen, F.T.; Al-Jawda, J.M. and Asmar, K.R. 2002a. Collection of some fish parasites from the northern sector of Saddam's river, mid Iraq. Sci. J. I.A.E.C., 4(2): 186- 191.
- Balasem, A.N.; Mhaisen, F.T.; Al-Jawda, J.M.; Asmar, K.R. and Adday, T.K. 2002b. Parasitic fauna of some fishes in northern sector of Saddam's river at Al-

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Mahmoodiya city, Iraq. Al-Tharwa Al-Samakia, 21: 43- 48. (In Arabic).

- Duijn, V.C. Jnr. 1973. Diseases of fishes, 3rd edn. Iliffe Books, London: 372pp.
- Fattohy, Z.I. 1975. Studies on the parasites of certain teleostean fishes from the river Tigirs, Mosul, Iraq. M. Sc. Thesis, Univ. Mosul: 136pp.
- Hoffman, G.L. 1998. Parasites of North American freshwater fishes, 2nd edn., Cornell Univ. Press, Ithaca: 539pp.
- Mhaisen, F.T. 1993. The role of wild fishes in farms of Iraq from parasitological and pathological points of view. Iraqi J. Vet. Med., 17: 126-136.
- Mhaisen, F.T. 1996. Natural enemies of farm fishes with special emphasis on fish farms of Iraq. Al-Tharwa Al-Samakia, 14: 92- 98. (In Arabic).
- Mhaisen, F.T. 2002. Literature review and check lists of acanthocephalans of fishes of Iraq. Al-Mustansiriya J. Sci., 13(1): 13- 25.
- Mhaisen, F.T. 2003. Index-catalogue of parasites and disease agents of fishes of Iraq (Unpublished).
- Mhaisen, F.T. 2003. Worm cataract in freshwater fishes of Iraq. Ibn Al-Haitham J. Pure Appl. Sci., 17(3): 25- 33 in press.
- Mhaisen, F.T.; Al-Saadi, A.A.J. and Al-Shamma'a, A.A. 1999. Some observations on fish parasites of Habbaniya lake. Ibn Al-Haitham J. Pure Appl. Sci., 12(1): 62-67.
- Mhaisen, F.T.; Khamees, N.R. and Al-Sayab, A.A. 1990. Flat worms (Platyhelminthes) of two species of gulls (*Larus ichthyaetus* and *L. canus*) from Basrah, Iraq. Zool. Mid. East, 4: 113- 117.
- Mhaisen, F.T.; Balasem, A.N.; Al-Khateeb, G.H. and Asmar, K.R. 2003. Recording of five monogenetic trematodes for the first time from fishes of Iraq. Bull. Iraq Nat. Hist. Mus., In press.
- Mohammad-Ali, N.R.; Balasem, A.N.; Mhaisen, F.T.; Salih, A.M. and Waheed, I.K. 1999. Observations on the parasitic fauna in Al-Zaafaraniya fish farm, south of Baghdad. Vet., 9(2): 79- 88.
- Salih, A.M.; Balasem, A.N.; Al-Jawda, J.M.; Asmar, K.R. and Mustafa, S.R. 2000. On a second survey of fish parasites in Al-Zaafaraniya fish farm- Baghdad. J. Diyala, 1(8 part 1): 220- 238. (In Arabic).
- Shul'man, S.S. 1966. Myxosporidia of the U.S.S.R. Nauka, Moscow (Engl. transl.). Amerind Publ., New Delhi: 632pp.
- Yamaguti, S. 1961. Systema helminthum, vol. III: The nematodes of vertebrates, part I + II. Intersci. Publ., New York: 1261pp.

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ظهور بعض طفيليات الأسماك في شبكة ميازل المدائن، جنوب بغداد

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الخلاصة

ع تم سبعة أنواع من الأسماك من شبكة الميازل في منطقة المدائن، جنوب بغداد خلال المدة من شهر آذار وحتى آب ١٩٩٣. كانت هذه الأسماك مصابة بـ ٢٢ نوعاً من الطفيليات سبعة بوجيات حيوانية، ثلاثة هدييات، سبعة مخرّ مات، نوعين من الديدان الخيطية، نوع واحد من الديدان شوكية الرأس ونوعين من القشريات) ونوع واحد من الفطريات. من بين هذه الطفيليات تم تسجيل كل من *Chloromyxum wardi* و *Cystidicola sp.* لأول مرة من العراق. وفضلاً عن ذلك فقد أضيف لقائمة طفيليات أسماك العراق ١١ نوعاً من المضيفات الجديدة.

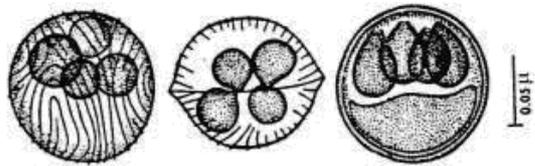


Fig. (1): Different views of *Chloromyxum wardi* spores (from Shul'man,1966).

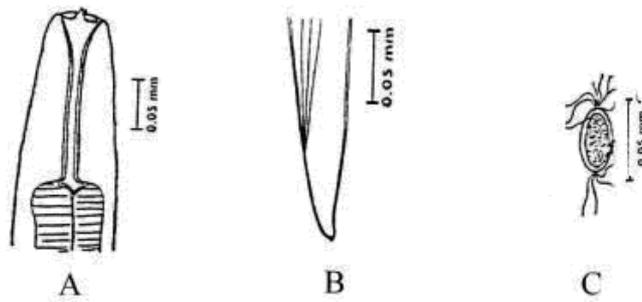


Fig. (2): *Cystidicola* sp.

- A: Anterior end of the female,
- B: Posterior end of the female,
- C: Egg (from Hoffman, 1998)