

Ectoparasites of seven fish species from Al-Husainia Creek, Karbala province, Mid Iraq*

**الطفيليات الخارجية لسبعة أنواع من الأسماك في جدول الحسينية، محافظة كربلاء،
وسط العراق***

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Abstract

Seven fish species (*Aspius vorax*, *Barbus grypus*, *B. luteus*, *B. sharpeyi*, *B. xanthopterus*, *Cyprinus carpio* and *Liza abu*) were collected from Al-Husainia creek, Karbala province, mid Iraq during the period from May 2005 till April 2006. Upon their inspection, these fishes were found to be infected with 26 ectoparasite species which included two ciliated protozoans, 16 monogeneans, metacercariae of one digenetic trematode and seven crustaceans. The case of single infection was noticed in 12 parasite species, followed with the double infection (in six parasite species) and the triple infection (in five parasite species). *B. luteus* harbored the highest number of parasite species (16 species), followed with both *A. vorax* and *L. abu* (8 species each), both *B. xanthopterus* and *C. carpio* (6 species each), *B. sharpeyi* (5 species) and *B. grypus* (4 species). The study revealed the occurrence of five monogeneans for the first time in Iraq as well as the record of 10 new fish hosts in Iraq for eight ectoparasite species.

الخلاصة

تم جمع سبعة أنواع من الأسماك (الشلك، الشبوط، الحمري، البني، الكطان، الكارب الإعتيادي والخشني) من جدول الحسينية، محافظة كربلاء، وسط العراق أثناء المدة من أيار 2005 وحتى نيسان 2006. تبين من فحص هذه الأسماك إصابتها بـ 26 نوعا من الطفيليات الخارجية التي شملت نوعين من الحيوانات الإبتدائية الهدبية، و16 نوعا من المخزّات أحادية المنشأ، وميتاسركاريا نوع واحد من المخزّات ثنائية المنشأ وسبعة أنواع من القشريات. لوحظت حالة الإصابة المفردة لدى 12 نوعا متطفلا، تبعثها الإصابة الثنائية (لدى ستة أنواع متطفلة) فالإصابة الثلاثية (لدى خمسة أنواع من الطفيليات). كانت أسماك الحمري مصابة بأكثر عدد من الأنواع المتطفلة خارجيا (16 نوعا)، تبعثها كل من أسماك الخشني والشلك (ثمانية أنواع لكل منهما)، ثم الكطان والكارب الإعتيادي (سبعة أنواع لكل منهما)، فالبني (خمسة أنواع)، فالشبوط (أربعة) أنواع. كشفت الدراسة ظهور خمسة أنواع من المخزّات أحادية المنشأ لأول مرة في العراق، فضلا عن تسجيل عشرة مضيفات جديدة في العراق لثمانية أنواع من الطفيليات الخارجية.

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Introduction

It is well documented that many parasite species hinder fish growth, reproduction and other activities in their natural environments (1). This situation is more pronounced in case of infection with the external parasites (ectoparasites) as such parasites have direct life cycles in which the parasites can complete their life cycles with no need for any intermediate host (2). The direct contact between fishes of the same species or even of different species make the task of life cycle completion so easy for

ectoparasites in comparison with that of the endoparasites. Among notable groups of ectoparasites affecting fishes are protozoans, monogeneans, leeches and crustaceans. Ectoparasites constitute 45.4% of the total number of parasite species of freshwater fishes parasites in Iraq (3).

Most surveys on fish parasites in Iraq were conducted on fishes from Tigris river, followed by those from Shatt Al-Arab river. Accounts on fishes from Euphrates river represent only 5.6% of the concerned literature in Iraq (4). As no previous account is available on ectoparasites of fishes from Al-Husainia creek, the present study was conducted to demonstrate the external parasitic fauna of such fishes with their percentages of infection. Such information is essential in fish management (5).

Materials and Methods

Monthly fish samples were collected from Al-Husainia creek, north east of Karbala province during the period from May 2005 till April 2006. Description of the sampling area as well as the physico- chemical features of its water was documented in a recent article (6). Both gill net (mesh size 2.5, 4.5 and 6.5 cm) and cast nets (mesh size 1.5 cm) as well as electrofishing were applied to catch fishes. Fishes were transported to the laboratory where they were examined for ectoparasites. Skin and gill smears were examined under low and then high magnifications. The index-catalogue of parasites and disease agents of fishes of Iraq (3) was followed to indicate number of host records for each parasite species in order to minimize number of references for each parasite species. For scientific names of the studied fishes, a scientific list (7) was followed. Parasite identification was done according to a notable key (8) as well as some other accounts related to some other ectoparasites which will be demonstrated in the discussion of this paper.

Results and Discussion

A total of 2615 fish specimens were collected during the present study. These included the following species with their numbers:-

412 *Aspius vorax* Heckel, 1843
311 *Barbus grypus* Heckel, 1843
397 *Barbus luteus* (Heckel, 1843)
286 *Barbus sharpeyi* Günther, 1974
317 *Barbus xanthopterus* (Heckel, 1843)
366 *Cyprinus carpio* L., 1758
526 *Liza abu* (Heckel, 1843)

Through the external examination of these fishes, 26 ectoparasites were recorded from their skin, fins and gills. These parasites belong to four major groups: protozoans, monogeneans, digenetic trematodes and crustaceans. The following is a brief account on the occurrence of these groups of parasites.

Protozoans

Two ciliated protozoans belonging to two genera were detected from the skin and gills of some inspected fishes (Table 1).

Table (1): Protozoan parasites with their hosts and prevalence of infection.

Parasite Species	Fish host	Prevalence of infection (%)
<i>Ichthyophthirius multifiliis</i> Fouquet, 1876	<i>B. luteus</i>	3.3
	<i>L. abu</i>	4.0
<i>Trichodina domerguei</i> (Wallengren, 1897)	<i>B. luteus</i>	7.6
	<i>C. carpio</i>	6.3
	<i>L. abu</i>	7.8

I. multifiliis was reported for the first time in Iraq from *Mugil dussumieri* (9). So far, it has 28 hosts in Iraq (3) including the two hosts of the present study. It causes the white spot disease in fishes (1). The second protozoan, *T. domerguei* was reported for the first time in Iraq (10) from eight fish species. Now, it has 33 hosts in Iraq (3) inclusive of the three hosts of the present study (Table 1).

Monogenea

Sixteen monogenetic species were reported in the present study (Table 2).

Table (2): Monogenean parasites with their hosts and prevalence of infection.

Parasite Species	Fish host	Prevalence of infection (%)
<i>Dactylogyrus carassobarbi</i> Gussev, Jalali et Molnár, 1993	<i>B. luteus</i>	26.0
<i>Dactylogyrus extensus</i> Müller et Van Cleave, 1932	<i>B. grypus</i>	17.0
	<i>B. xanthopterus</i>	8.2
	<i>C. carpio</i>	9.3
<i>Dactylogyrus rohdeianus</i> Jalali, Papp et Molnár, 1995*	<i>B. luteus</i> **	0.3
	<i>B. sharpeyi</i> **	0.4
<i>Dactylogyrus skrjabini</i> Achmerow, 1958	<i>B. grypus</i> **	21.9
<i>Dactylogyrus tuba</i> Linstow, 1878	<i>B. sharpeyi</i> **	9.8
<i>Dactylogyrus varicorhini</i> Bychowsky, 1958	<i>B. xanthopterus</i> **	14.8
<i>Dogielius planus</i> Bychowsky, 1958	<i>B. luteus</i>	0.3
<i>Diplozoon barbi</i> Reichenbach-Klinke, 1951	<i>B. luteus</i>	2.5
	<i>C. carpio</i>	3.6
<i>Diplozoon kasimii</i> Rahemo, 1980	<i>B. luteus</i>	9.1
<i>Diplozoon paradoxum</i> Nordmann, 1832*	<i>B. luteus</i> **	0.3
<i>Eudiplozoon nipponicum</i> (Goto, 1891)	<i>B. sharpeyi</i> **	2.5

<i>Paradiplozoon homoion</i> (Bychowsky et Nagibina, 1959) *	<i>B. xanthopterus</i> **	0.6
<i>Paradiplozoon megan</i> (Bychowsky et Nagibina, 1959) *	<i>A. vorax</i> ** <i>B. xanthopterus</i> **	0.5 0.3
<i>Paradiplozoon pavlovskii</i> (Bychowsky et Nagibina, 1959)	<i>A. vorax</i> <i>B. luteus</i> <i>B. xanthopterus</i>	10.7 4.0 2.8
<i>Paradiplozoon vojteki</i> (Pejôoch, 1968) *	<i>B. xanthopterus</i> **	0.6
<i>Microcotyle donavini</i> Van Beneden et Hesse, 1863	<i>L. abu</i>	2.5

* New parasite record in Iraq.

** New host record in Iraq.

The present study revealed the occurrence of five monogenean species for the first time in Iraq (*D. rohdeianus*, *D. paradoxum*, *P. homoion*, *P. megan* and *P. vojteki*). Their hosts and prevalence of infection are shown in table (2). A detailed account on their description and measurement was recently given in a separated article (11).

The occurrence of the other reported monogeneans of the present paper is given here:-

D. carassobarbi was reported for the first time in Iraq from *B. luteus* (12). Now, it has only two hosts in Iraq (3) inclusive of *B. luteus* of the present study.

D. extensus was recorded for the first time in Iraq from *C. carpio* (13). Now, it has 12 hosts in Iraq (3) inclusive of the three hosts of the present study (*B. grypus*, *B. xanthopterus* and *C. carpio*).

D. skryabini was reported for the first time in Iraq from *C. carpio* (13). *B. grypus* of the present study represents a new host record for this parasite in Iraq which now brings its host number in Iraq to five (3).

D. tuba was reported for the first time in Iraq from *B. luteus* (14). Now, *B. sharpeyi* represents a new host record and this brings its host number in Iraq into two hosts (3).

D. varicorhini was reported for the first time in from *Varicorhinus trutta* (15). *B. xanthopterus* of the present study adds a new host and brings its host list in Iraq to three (3).

D. planus was reported for the first time in Iraq from *B. luteus* (16). Now it has two hosts in Iraq (3) inclusive of *B. luteus* of the present study.

The twin fluke *D. barbi* was reported for the first time in Iraq from *Chondrostoma nasus*, *C. regium* and *C. carpio* (17). Now, it has seven hosts in Iraq (3) inclusive of *B. luteus* and *C. carpio* of the present study.

D. kasimii was reported for the first time in Iraq from *Cyprinion macrostomum* (18). Now, it has 13 hosts in Iraq (3) inclusive of *B. luteus* of the present study.

E. nipponicum was reported for this first time in Iraq from *B. sharpeyi* (19) as *Diplozoon nipponicum*. *B. sharpeyi* of the present study adds a new host and brings its host list in Iraq into two hosts (3).

P. pavlovskii was reported for the first time in Iraq from *A. vorax* (20). Now, it has 11 hosts in Iraq (3) inclusive of *A. vorax*, *B. luteus* and *B. xanthopterus* of the present study.

M. donavini was reported for the first time in Iraq from *L. abu* (21). Now, it has nine hosts in Iraq (3) inclusive of *L. abu* of the present study.

Digenetic Trematoda

Metacercaria of only one digenetic trematode, *Clinostomum complanatum* (Rud., 1819) was reported from gills of 0.5% of *B. luteus* and skin of 0.2% of *L. abu*. Fishes represent the second intermediate hosts for this parasites, while the adult worms infect aquatic birds (1). This metacercaria was reported for the first time in Iraq from *B. luteus* and *A. vorax* (20) and now it has 21 fish hosts in Iraq (3) inclusive of *B. luteus* and *L. abu* of the present study.

Crustacea

Seven crustacean species were recorded from gills of six fish hosts of the present study (Table 3).
Table (3): Crustacean parasites with their hosts and prevalence of infection.

Parasite species	Fish host	Prevalence of infection (%)
<i>Dermoergasilus varicoleus</i> Ho, Jayarajan et Ridhakrishnan, 1992	<i>B. luteus</i> *	0.8
	<i>L. abu</i>	1.3
<i>Ergasilus barbi</i> Rahemo, 1982	<i>A. vorax</i> *	21.6
	<i>B. luteus</i>	9.8
	<i>C. carpio</i>	28.1
	<i>L. abu</i>	26.8
<i>E. mosulensis</i> Rahemo, 1982	<i>A. vorax</i>	13.4
	<i>B. luteus</i>	10.8
	<i>L. abu</i>	25.9
<i>E. peregrinus</i> Heller, 1868	<i>A. vorax</i>	3.2
	<i>B. luteus</i> *	1.8
	<i>B. sharpeyi</i> *	0.7
<i>Ergasilus rostralis</i> Ho, Jayarajan et Ridhakrishnan, 1992	<i>A. vorax</i>	4.1
	<i>B. grypus</i> *	2.6
	<i>B. luteus</i>	3.5
	<i>B. sharpeyi</i> *	1.1
<i>Ergasilus sieboldi</i> Nordmann, 1832	<i>A. vorax</i>	57.3
	<i>B. grypus</i>	5.5
	<i>B. luteus</i>	24.2
	<i>B. sharpeyi</i>	4.9
	<i>C. carpio</i>	10.7
	<i>L. abu</i>	46.4
<i>Lamproglana pulchella</i> Nordmann, 1832	<i>A. vorax</i>	3.2
	<i>B. luteus</i>	1.8

* New host record in Iraq.

D. varicoleus was reported for the first time in Iraq from *L. abu* (22). *B. luteus* of the present study represents a new host record and brings its host list in Iraq to nine hosts (3) inclusive of *B. luteus* of the present study.

E. barbi was described from *B. grypus* for the first time as a new species (23) and its publication was given latter (24). *A. vorax* of the present study adds a new host and brings its host list in Iraq to 13 hosts (3).

E. mosulensis was described from *L. abu* for the first time as a new species (23) and its publication was given latter (24). Now, it has 16 hosts in Iraq (3) inclusive of *A. vorax*, *B. luteus* and *L. abu* of the present study.

E. peregrinus was reported for the first time in Iraq from both *A. vorax* and *L. abu* (15). Both *B. luteus* and *B. sharpeyi* of the present study now represent two new records and bring its host list in Iraq to eight hosts (3).

E. rostralis was reported for the first time in Iraq from *L. abu* (22). *B. grypus* and *B. sharpeyi* of the present study now represent two new host records for this parasite in Iraq and bring its list to 19 hosts (3).

E. sieboldi was reported for the first time in Iraq from *L. abu* (9). Now, it has 25 hosts in Iraq (3) inclusive of *A. vorax*, *B. grypus*, *B. luteus*, *B. sharpeyi*, *C. carpio* and *L. abu* of the present study.

L. pulchella was reported for the first time in Iraq from both *C. regium* and *V. trutta* (25). Now, it has 19 fish hosts in Iraq (3) inclusive of both *A. vorax* and *B. luteus* of the present study.

It is clear from the present study that *B. luteus* harbored the highest number of ectoparasites species (17 species), followed by both *L. abu* and *A. vorax* (8 species each), *B. sharpeyi* and *B. xanthopterus* (6 species each), *C. carpio* (5 species) and *B. grypus* (4 species). In connection with the distribution of the infection among hosts, the crustacean *E. sieboldi* was found to infect the highest number of hosts (6 hosts), followed by both *E. barbi* and *E. rostralis* (4 hosts each). Parasites infecting three hosts included *T. domerguei*, *D. extensus*, *P. pavloskii*, *E. mosulensis* and *E. peregrinus*, while parasites infecting two hosts included *I. multifiliis*, *D. barbi*, *P. megan*, *C. complanatum*, *D. varicoleus* and *L. pulchella*. Each of the remaining 12 parasite species infects one fish host (monoxenous parasites). All these monoxenous parasites belong to the group of Monogenea, which are known for their host specificity (5).

A total of 71.7% of the cases of prevalence of infection with the studied ectoparasites was affecting less than 10% of the examined fishes, while 24.5% of the cases was affecting between 10-20% of the examined fishes. The highest prevalence of infection (3.8%) was with the crustacean *E. sieboldi* (46.4% of the examined *L. abu* and 57.3% of the examined *A. vorax*). So, the prevalence of infections of fishes of Al-Husainia creek with the studied ectoparasites of the present study was generally mild and makes no real threat to the fisheries there.

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