

## Some Monogeneans from Gills of Three Freshwater Fish Species and the First Record of *Ligophorus heteronchus* Euzet & Suriano, 1977 in Iraq from Gills of *Liza abu* (Heckel, 1843)

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**Abstract.** The present study reports the occurrence of five species of monogeneans on gills of three freshwater fishes which were collected from fish markets in Baghdad city. These parasites included *Dactylogyrus achmerowi*, *D. anchoratus* and *D. dulkeiti* from *Cyprinus carpio*, *D. lenkorani* from *Mesopotamichthys sharpeyi* and *D. varicorhini* from *Carasobarbus luteus*. In addition to these parasites, the monogenean *Ligophorus heteronchus* was recorded from gills of *Liza abu*. The occurrence of the later parasite in the present study represents its first record in Iraq. The description and measurement of *L. heteronchus* were given.

**Key words:** Monogenea, *Dactylogyrus*, *Ligophorus heteronchus*, *Liza abu*, Iraq.

### Introduction

The monogeneans are hermaphroditic flat worms that complete their life cycle on a single host only and they commonly live as ectoparasites on gills or body surface of freshwater and marine fishes (6, 11). Among the major identifying characteristics of the monogeneans are the features of their attachment organs, copulatory organ, gonads and the eyes spots (9). Metazoan parasites, especially monogeneans can cause gill infestations and inhibit oxygen exchange across gill lamella (16).

Monogeneans belonging to the genus *Ligophorus* Euzet & Suriano, 1977 live parasitically on gills of several fish species of the family Mugilidae (12) in the Mediterranean Sea and north Atlantic. Subsequently, the distribution of the species of *Ligophorus* was expanded to include the north and south Pacific (18). *Ligophorus* is amended to include the lack of a sclerotised vaginal system in some species and the ovary being J- to U-shaped (19).

Flatworms of the class Monogenea are considered as the prevalent parasites among freshwater fishes as they include 23 genera and 139 species which accounts for 33% of the parasitic fauna of freshwater fishes of Iraq (13). Among these monogeneans, 77 species belong to the genus *Dactylogyrus* and three species to the genus *Ligophorus* (13). Species of *Ligophorus* so far recorded in Iraq does not include *L. heteronchus*. So, the occurrence of this parasite adds a new item to the *Ligophorus* species which parasitize freshwater fishes of Iraq.

## Material and Methods

A survey work was carried out to detect the ectoparasites of some fish markets of Baghdad city during the period from September 2012 to January 2013. Fishes belong to four species were brought to the laboratory. Inspection of fishes for parasites was undertaken as soon as possible. Smear from fish skin, fins and buccal cavity were taken through slight scraping. Gills were removed and placed in Petri dishes with water and then microscopically examined.

Smears were examined under a light compound microscope after separation of the monogeneans from gill filaments by using a fine needle. All parasites were stained with aqueous neutral red and permanent slides were prepared. Drawing was achieved by using camera Lucida. Measurements of parasites were done by using an ocular microscope. Parasites identification was achieved by consulting two taxonomical accounts (5, 8). The information on the occurrence of these parasite species was checked with the index-catalogue of parasites and disease agents of fishes of Iraq (13).

## Results and Discussion

A total of 117 fish specimen belonging to three fish species were collected from some fish markets of Baghdad city. These fishes included *Mesopotamichthys sharpeyi* (Günther, 1874), *Carasobarbus luteus* (Heckel, 1843), *Cyprinus carpio* Linnaeus, 1758 and *Liza abu* (Heckel, 1843). The scientific names of these fishes were checked according to Froese & Pauly (7). Upon the dissection of these fishes, six parasites species were recorded from these fishes. These included five species of the genus *Dactylogyrus* (*D. achmerowi*, *D. anchoratus*, *D. dulkeiti*, *D. lenkorani* and *D. varicorhini*) as well as *L. heteronchus*. The following is a brief account on the occurrence of these parasites.

### ***Dactylogyrus achmerowi* Gussev, 1955:**

This monogenean was found on gills of *C. carpio* of the present study with an infection rate of 4.2%. This parasite was reported for the first time in Iraq from the same fish from Al-Wahda fish Hatchery at Suwaira, south of Baghdad (14). So far, it has 11 fish hosts in Iraq (13).

### ***Dactylogyrus anchoratus* (Dujardin, 1845):**

This parasite was detected from gills of *C. carpio* of the present study with an infection rate of 6.6%. It was repeated for the first time in Iraq from the same fish from Tigris River (15). Five hosts are so far known for *D. anchoratus* in Iraq (13).

### ***Dactylogyrus dulkeiti* Bykhovskii, 1936:**

This monogenean was found on gills of *C. carpio* of the present study with a rate of 35.7%. This worm was reported for the first time in Iraq from the same host from Al-Zaafaraniya fish farm, south of Baghdad city (17). So far, only five hosts are known for this parasite in Iraq (13).

***Dactylogyrus lenkoroni* Mikailov, 1967:**

This species was reported on gills of *M. sharpeyi* of the present study with an infection rate of 13.1%. This parasite was detected for the first time in Iraq from skin and gills of *Barbus sharpeyi* (= *M. sharpeyi*) from Diyala River (2). Four hosts are so far known for *D. lenkorani* in Iraq (13).

***Dactylogyrus varicorhini* Bykhovskii, 1958:**

This species was detected from gills of *C. luteus* of the present study with a rate of 21%. It was reported the first time in Iraq from gills of both *C. luteus* and *Varicorhinus trutta* (= *Capoeta trutta*) from Tigris River in Salah Al-Dien province (1). So far, three hosts are known for this parasite in Iraq (13).

***Ligophorus heteronchus* Euzet & Suriano, 1977 (Fig. 1):**

The present investigation showed the existence of the mongenean *L. heteronchus* on the gills of *L. abu* with an infection rate of 7.1%. *L. abu* varied from 16-20 cm in length and 70-110 gm in total weight. As this parasite was not previously recorded from Iraq (13), the following is a brief description and measurements (in mm) of this parasite. These measurements (range and mean in parenthesis) were based on six specimens.

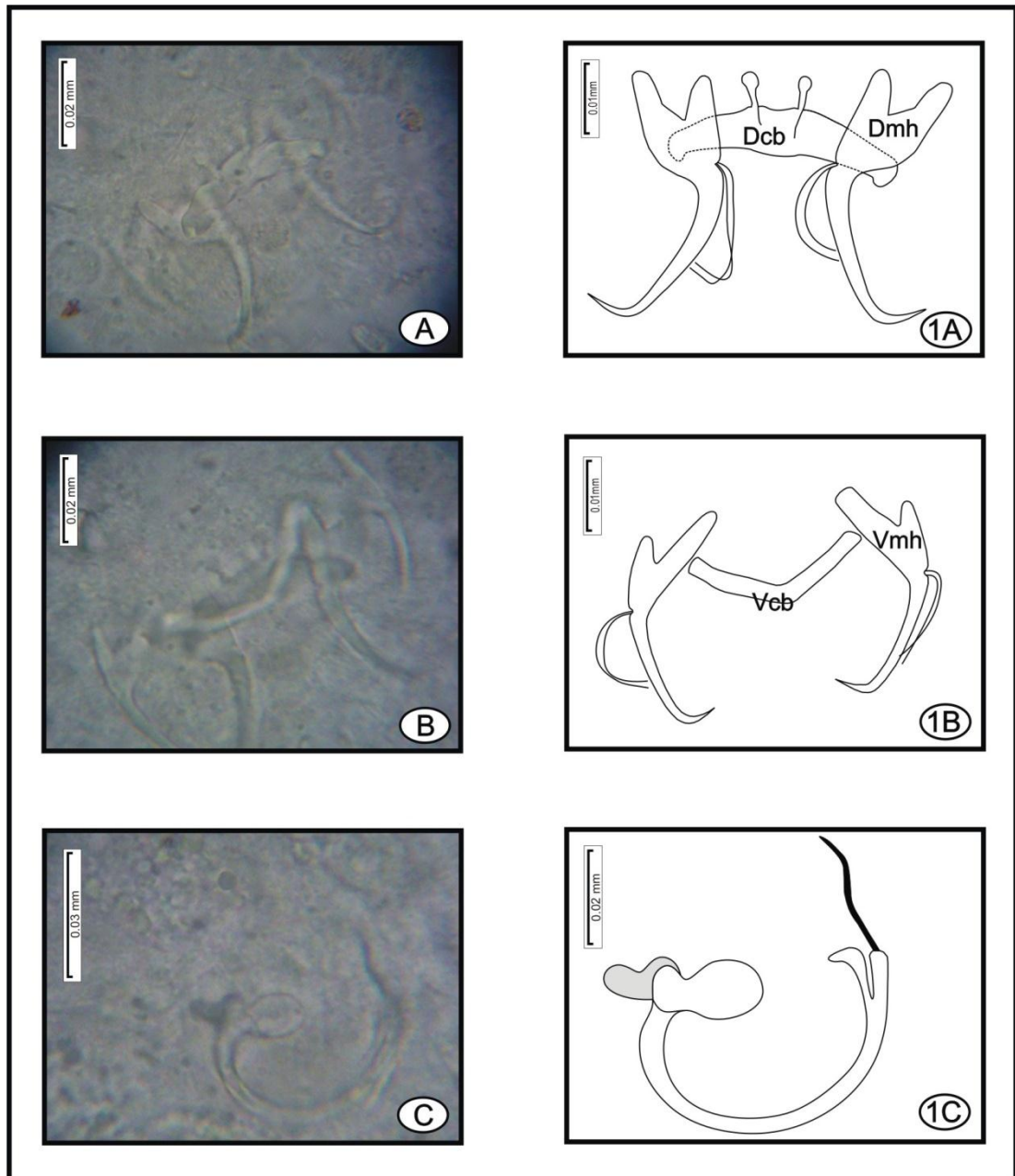
Worm length of median size 0.45-0.5 (4.8), worm wide 0.09-0.12 (0.1), overall length of the dorsal median hook 0.035-0.04 (0.037), overall length of the ventral median hook 0.027-0.033 (0.03), ventral connecting bar 0.002-0.003 (0.0025) x 0.03-0.035 (0.032), dorsal connecting bar 0.007-0.01 (0.008) x 0.032-0.04 (0.36), diameter of tube of copulatory organ about 0.001, and length of supporting bar 0.064-0.078 (0.071).

The above measurements of *L. heteronchus* are in agreement with those of the holotype of this parasite (8).

Three other *Ligophorus* species were so far reported from freshwater fishes of Iraq. These were: *L. mugilinus* (erroneously reported as *Haliotrema mugilinus*) from gills of both *L. abu* and *L. subviridis* (= *Chelon subviridis*) from Garimat Ali River, Basrah (10), *L. acuminatus* from gills of *L. abu* from fish markets of Baghdad city (3) and *L. imitans* from gills of *L. abu* from Tigris River at Adhamiyah region, Baghdad city (4). So, *L. heteronchus* of the present investigation is the fourth species of *Ligophorus* so far known in freshwater fishes of Iraq.

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**Fig. 1. *Ligophorus heteronchus* from *Liza abu*.**

- A: Photomicrograph of the dorsal median hook and dorsal connecting bar.  
 1A: Camera Lucida drawing of the dorsal median (Dmh) hook and dorsal connecting bar (Dcb).  
 B: Photomicrograph of the ventral median hook and ventral connecting bar.  
 1B: Camera Lucida drawing of the ventral median hook (Vmh) and ventral connecting bar (Vcb).  
 C: Photomicrograph of the copulatory organ.  
 1C: Camera Lucida drawing of the copulatory organ (Co).

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بعض أحادييات المنشأ من غلاصم ثلاثة أنواع من أسماك المياه العذبة وأول تسجيل للطفيلى  
*Ligophorus heteronchus* Euzet & Suriano, 1977 في العراق من غلاصم أسماك  
الخشني (*Liza abu* (Heckel, 1843)

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**الخلاصة.** تم في هذه الدراسة بيان ظهور خمسة أنواع من أحادييات المنشأ على غلاصم ثلاثة أنواع من أسماك المياه العذبة التي أخذت من أسواق بيع السمك في مدينة بغداد. شملت هذه الطفيليات *Dactylogyrus achmerowi* و *D. anchoratus* و *D. dulkeiti* من أسماك الكارب الإعتيادي، *D. lenkorani* من أسماك البني و *D. varicorhini* من أسماك الحمري، وبالإضافة لهذه الطفيليات تم تسجيل المونوجيني *Ligophorus heteronchus* من غلاصم أسماك الخشني، ويمثل ظهور هذا الطفيلى الأخير في الدراسة الحالية بمثابة أول تسجيل له في العراق. وتم إعطاء وصف وقياسات هذا الطفيلى.