

## The First Record of Two Monogeneans: *Dactylogyrus dogieli* Gussev, 1953 and *Octomacrum europaeum* Roman & Bykhovskii, 1956 from Fishes of Iraq

Bashar A. Al-Sa'adi<sup>1</sup>, Furhan T. Mhaisen<sup>2</sup> and Abdul-Razzak L. Al-Rubae<sup>1</sup>

<sup>1</sup> Al-Musaib Technical College, Babylon Province, Iraq

<sup>2</sup> Tegnergvägen 6B, 641 36 Katrineholm, Sweden

e-mail: mhaisenft@yahoo.co.uk

**Abstract.** During the period from July 2006 till the end of June 2007, a total of 471 fish specimens belonging to 24 species from the Euphrates River at Al-Musaib city were inspected for parasites. Among the 65 parasite species recorded from these fishes, two monogeneans were recorded for the first time in Iraq. These were: *Dactylogyrus dogieli* Gussev, 1953 from five fish species (*Carassobarbus luteus*, *Mesopotamichthys sharpeyi*, *Alburnus sellal*, *Cyprinion kais* and *Ctenopharyngodon idella*) and *Octomacrum europaeum* Roman & Bykhovskii, 1956 from three fish species (*C. kais*, *C. macrostomum* and *Garra rufa*). Full description, measurements and illustrations of both monogenean species are given, in addition to the deposition of slides of these two parasites in the Iraq Natural History Research Center and Museum, University of Baghdad. With these two records, the total number of valid *Dactylogyrus* species from freshwater fishes of Iraq reached 77 and the total number of monogeneans of freshwater fishes of Iraq reached 144 species.

**Key words:** Monogenea, *Dactylogyrus dogieli*, *Octomacrum europaeum*, fishes, Iraq.

### Introduction

The class Monogenea, used to be known as monogenetic trematodes, includes skin and gill flat worm parasites of fishes which are characterized by a posterior attachment organ, the haptor or opisthaptor (3). This class is traditionally divided into two subclasses; Monopisthocotylea whose members are provided with a haptor comprising a single attachment unit, with hooks and hooklets and Polyopisthocotylea whose members are provided with complex haptor with a multiple attachment units, including suckers, clamps or both (11, 5). Monogeneans have a simple direct life cycle, infecting only a single host. The larva is usually a small ciliated oncomiracidium, which hatches from the egg and swims to locate and infect another host (16). Monogeneans are important fish pathogens, especially for carp fingerlings under extensive fish culture practice and their direct life cycles and fish crowding are good conditions for their easy spread among fishes (4).

The first account on the monogeneans in Iraq was achieved in 1975 which dealt with the first record of the monogeneans *Diplozoon kasimii* from gills of *Cyprinion macrostomum* from Tigris River at Mosul city (8). After that, extensive surveys on fish parasites resulted in the record of 141 monogeneans from different freshwater fishes of Iraq (15). So, members of the class Monogenea represent 28.3% of the total number of

parasitic species of freshwater fishes of Iraq (15). The present article documents the first occurrence of two species of monogeneans for the first time in Iraq.

### Materials and Methods

Fish specimens were collected from the Euphrates River at Al-Musaib city (32°47'N, 44°17'E) during the period from July 2006 till the end of June 2007. Fishes were caught with the aid of a cast net and were directly transported to the laboratory where they were measured, weighed and sexed. Fishes were freshly examined by making smears from skin, fins and buccal cavity. Gills were removed and placed in Petri dishes with water and microscopically inspected (3). Gill smears were examined and after removing the monogeneans from gill filaments, they were put on slides. Few drops of glycerin jelly were used to make permanent slides (13). Prevalence of infection was calculated (14). Parasite identification was done according to some major taxonomical references (6, 11, 17). The valid scientific names of studied fishes were based on Froese & Pauly (9).

### Results and Discussion

The inspection of the fishes from the Euphrates River at Al-Musaib city revealed the occurrence of 65 parasite species (1). Among such parasites, two monogeneans were recorded for the first time in Iraq. These were: *Dactylogyrus dogieli* of the family Dactylogyridae and *Octomacrum europaeum* of the family Octomacridae. The following is a brief description of these parasites.

#### ***Dactylogyrus dogieli* Gussev, 1953 (Fig. 1):**

This parasite was reported from gills of *Carassobarbus luteus*, *Mesopotamichthys sharpeyi*, *Alburnus sellal*, *Cyprinion kais* and *Ctenopharyngodon idella* of the present study. The percentage incidence of infection of these fishes with this parasite was 5.2%, 50%, 4.3%, 1.7% and 50%, respectively.

*D. dogieli* is a flat worm with a posterior haptor consisting of seven pairs of small marginal hooks (hooklets) and one pair of median anchors with a single connecting bar. Two pairs of eye spots are present in the anterior part of the body which takes the form of four finger-like projections. In connection with the measurements, *D. dogieli* has a length of 0.8-1.0 mm and a width of 0.28-0.3 mm. Length of marginal hooks 0.027-0.034 mm; overall length of median hook 0.068-0.082 mm; inner root 0.029-0.04 mm; outer root 0.004-0.008 mm; main part 0.040-0.049 mm; point 0.029-0.035 mm; connecting bar 0.006-0.008 x 0.049-0.062 mm. Total length of copulatory organ 0.054-0.074 mm. These measurements are in agreement with those of *D. dogieli* reported by three major systematic accounts (6, 11, 17).

Microphotograph of *D. dogieli* of the present investigation was documented in the student's thesis (1) and voucher specimen was deposited in the Iraq Natural History Research Center and Museum, University of Baghdad under the serial number INHM-TRC 12.

*D. dogieli* is known to infect fishes of the genus *Carassius* (6, 17, 12). The occurrence of some introduced freshwater fishes in Iraqi waters may facilitate the possibility of lateral transfers of alien parasites between introduced and some native fishes, and hence the existence of *D. dogieli* on the five above-named fishes of the present study. While surveying some freshwater fishes from Italy for parasites, 17 of the 35 monogeneans were considered as alien, two as native and the remaining 16 of unknown origin (10). In Iran, 18 *Dactylogyru*s species infecting five imported live fish species were naturally transmitted to native fishes (18). In connection with the monogeneans of fishes of Iraq, 36 *Dactylogyru*s species were so far reported from a single host each, while the remaining 41 *Dactylogyru*s species were reported from more than one host with *D. vastator* being reported from 33 fish hosts (15). This demonstrates the probable parasite exchange between exotic and native fishes of Iraq. It is appropriate to mention here that after the present record of this parasite during July 2006 till the end of June 2007; *D. dogieli* was reported from *Cyprinus carpio* from floating cages and earthen pond at Saddat Al-Hindia district, Babylon province (2) which is not so far from the sampling area of the present investigation.

***Octomacrum europaeum* Roman & Bykhovskii, 1956 (Fig. 2):**

This parasite was recorded from gills of *C. kais*, *C. macrostomum* and *Garra rufa* of the present study. The percentage incidence of infection of these fishes with this parasite was 6.7%, 1.7% and 9.1%, respectively.

*O. europaeum* is a flat worm with a haptor divided from the body by a slight constriction. Four pairs of adhesive clamps are situated along the haptor edges. Two anchors are present. An oral funnel is present which has two suckers along its edges. Pharynx, esophagus and bucco-esophageal duct are present. The intestine has two trunks and many lateral diverticula which do not merge together. A highly developed genital sucker with a sclerotized penis at its bottom is present behind the esophagus. One ovary lies in the posterior part of the body. One small and round testis in the form of a follicular mass is present. No vaginal duct is present; the uterus opens into the genital atrium ventrally from the genital sucker. In connection with its measurements, *O. europaeum* has a length of 0.6-1.5 mm and a width 0.14-0.35 mm. Size of clamps of haptor 0.06-0.09 x 0.10-0.12 mm. Length of hook of anchor 0.014-0.016 mm. These measurements are similar to those of *O. europaeum* reported by three major systematic accounts (6, 11, 17).

Microphotograph of *O. europaeum* of the present investigation was documented in the student's thesis (1) and voucher specimen was deposited in the Iraq Natural History Research Center and Museum, University of Baghdad under the serial number INHM-TRC 11.

*O. europaeum* is known on gills of *Alburnoides bipunctatus* (17). This species is distributed only in Europe, while five other species of the genus *Octomacrum* are distributed on catostomids and cyprinids of North America (7). The occurrence of *O.*

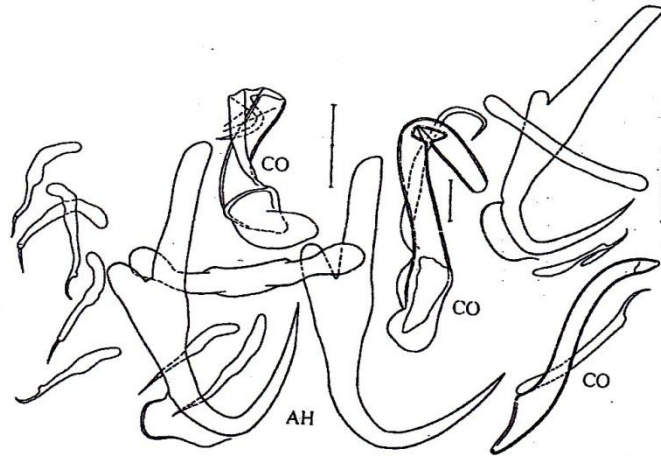
*europaeum* of the present study from the above-named cyprinids of Iraq could be explained on the basis of the possibility of parasite transfer between some introduced fishes and native fishes of Iraq as it was the case in some freshwater Italian fishes infected with 35 monogenean species (10).

To conclude on the results of the present investigation, the record of *D. dogieli* adds the *Dactylogyrus* species number 77 to the valid species of *Dactylogyrus* of freshwater fishes of Iraq (15). The record of *O. europaeum* represents the first record of this parasite as well as the first record of the genus *Octomacrum* from fishes of Iraq. The records of these two monogeneans bring the total number of monogeneans of freshwater fishes of Iraq to 144 species (15).

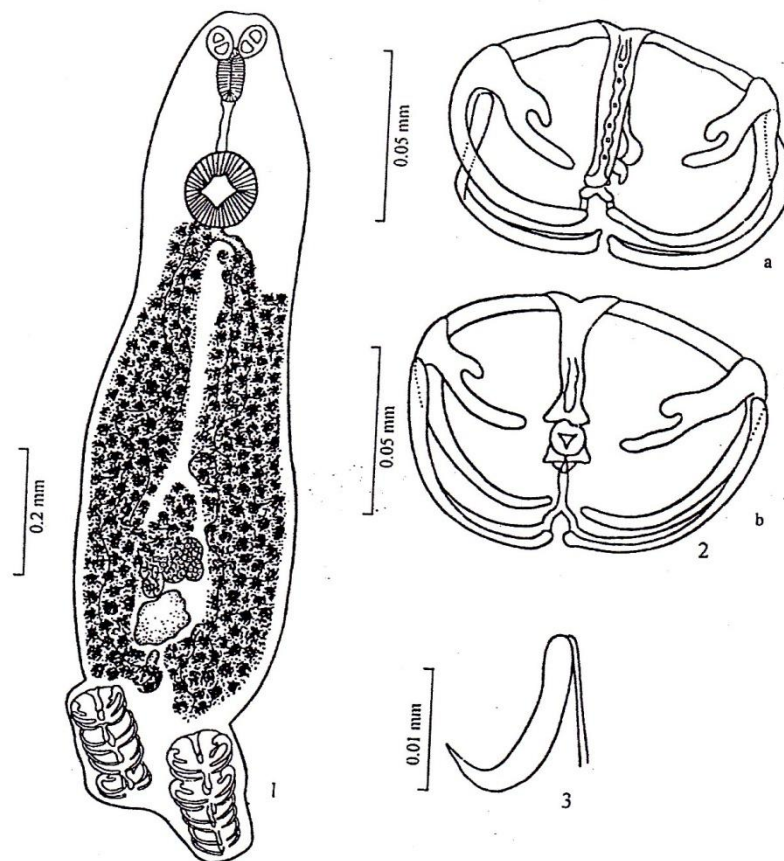
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**Fig. 1: *Dactylogyrus dogieli*:**  
AH- armament of the haptor, CO- copulatory organ.  
Scale bar= 0.01 mm. (After reference no. 17).



**Fig. 2: *Octomacrum europaeum*:**  
1- Total view, 2- Clamp (a- ventral view, b- dorsal view),  
3- Anchor. Scale bar= 0.01 mm. (After reference no. 17).

**أول تسجيل لنوعين من المونوجينيا: *Dactylogyrus dogieli* Gussev, 1953 و *Octomacrum europaeum* Roman & Bykhovskii, 1956 من أسماك العراق**

بشار عبدالحسين السعدي<sup>1</sup>، فرحان ضمد محيسن<sup>2</sup> وعبد الرزاق لعبيبي الربيعي<sup>1</sup>

1 الكلية التقنية في المسيب، محافظة بابل، العراق

2 بناية 6B، 36 641 كاتريناهولم، السويد

e-mail: mhaisenft@yahoo.co.uk

**الخلاصة.** تم خلال المدة من شهر تموز 2006 ولغاية نهاية شهر حزيران 2007 فحص 471 سمكة تعود لأربعة وعشرين نوعا من نهر الفرات عند مدينة المسيب. من بين 65 نوعا من الطفيليات المسجلة من هذه الأسماك، سجل نوعان من المونوجينيا لأول مرة في العراق هما *Dactylogyrus dogieli* Gussev, 1953 من خمسة أنواع من الأسماك (الحمري والبني والسلال والبنيني صغير الفم والكارب العشبي) والنوع *Octomacrum europaeum* Roman & Bykhovskii, 1956 من ثلاثة أنواع من الأسماك (البنيني صغير الفم والبنيني كبير الفم والكركور الأحمر). تم إعطاء الوصف الكامل وقياسات ورسوم كلا النوعين من المونوجينيا مع إيداع شرائح هذين النموذجين من الطفيليات في مركز بحوث ومتحف التاريخ الطبيعي بجامعة بغداد. بهذين التسجيلين إرتفع عدد الأنواع الشرعية من الجنس *Dactylogyrus* من أسماك المياه العذبة في العراق إلى 77 نوعا ووصل عدد أنواع المونوجينيا من أسماك المياه العذبة في العراق إلى 144 نوعا.