

DESCRIPTION OF FIVE MONOGENETIC TREMATODES FOR THE FIRST TIME FROM FISHES OF IRAQ

A. A. J. Al-Saadi* F. T. Mhaisen* H. R. Hasan**

ABSTRACT

During the period from May 2005 till April 2006, a total of 2615 fishes, belonging to seven species were collected from Al-Husainia creek, Karbala province, Iraq. These fishes were infected with 33 species of ecto- and endoparasites. Among the ectoparasites, five monogenetic trematodes were recorded for the first time in Iraq. These monogeneans included: *Dactylogyrus rohdeianus* from gills of both *Barbus luteus* and *B. sharpeyi*, *Diplozoon paradoxum* from gills of *B. luteus*, *Paradiplozoon homoion* from gills of *B. xanthopterus*, *P. megan* from gills of both *Aspius vorax* and *B. xanthopterus* and *P. vojteki* from gills of *B. xanthopterus*. Full description with measurements and illustrations of these parasites were demonstrated.

INTRODUCTION

Among the major groups of fish parasites, monogeneans are important as they cause severe damage to skin and gills (12). They have direct life cycles and therefore they can move easily from one host to another (17).

According to Mhaisen (25), a total of 101 species of monogeneans were, so far, recorded from freshwater fishes of Iraq. This number represents 31.4% of the total number of the parasites existed in freshwater fishes of Iraq. The records of monogeneans from Iraq came through surveying fishes from different parts of Iraq. Some surveys were done on fishes captured from natural water bodies (rivers, tributaries, dam lakes and marshes), as well as, from some fish farms from north, mid and south of Iraq. Among notable records from the natural water bodies are those of Rahemo (27), Khamees (23), Ali *et al.* (7, 8), Abdul-Ameer (1), Rasheed (28), Abdullah (2), Gussev *et al.* (19), Al-Ali (6), Jori (21), Balasem *et al.* (13), Abdullah (3), Mhaisen *et al.* (26), Kritsky *et al.* (24), Abdullah (4, 5), Bilal (14), Jori (22) and Al-Sa'adi (11). From these records, five species were considered as new to science (*species de novo*). These included one species by Rahemo (27) and four by Gussev *et al.* (19).

As most of the recent extensive surveys on fish parasites throughout Iraq added at least two items, each, to the parasitic fauna of freshwater fishes of Iraq (3, 9, 14, 22, 11), it is expected to meet more new records. The present article reports the occurrence of additional five monogeneans to the parasitic fauna of freshwater fishes of Iraq.

MATERIALS AND METHODS

Gill nets (mesh size of 2.5, 4.5 and 6.5 cm), cast nets (mesh size 1.5 cm) and electro fishing were applied to catch fishes from Al-Husainia creek, north east of Karbala province, mid Iraq during the period from May 2005 till April 2006. Detailed description of this creek, its branches and the sampling area are shown in Al-Saadi (2007). Fishes were transported to the laboratory where they were examined according to Amlacher (12), with the aid of hand lens, for any visible parasites. Skin and gill smears were examined with a dissecting microscope and then by a compound microscope (Olympus). Monogeneans were fixed with neutral red and glycerin (3: 1) as recommended by Abdullah (2) and identified

Part of Ph. D. thesis of the first author.

* Coll. Educ. (Ibn Al-Haitham), Univ. Baghdad, Baghdad, Iraq.

** Coll. Educ., Univ. Karbala, Karbala, Iraq.

according to Bykhovskaya-Pavlovskaya *et al.* (15), Gussev (18) and Jalali *et al.* (20). Original photographs were made and the figures were drawn by using a camera lucida. Measurements of parasites were achieved by ocular micrometer. Coad's (16) list was followed for the scientific names of captured fishes.

RESULTS AND DISCUSSION

During the present study, a total of 2615 fish specimens were captured. These included 412 *Aspius vorax*, 311 *Barbus grypus*, 397 *B. luteus*, 286 *B. sharpeyi*, 317 *B. xanthopterus*, 366 *Cyprinus carpio* and 526 *Liza abu*.

The parasitological investigation of these fishes revealed the occurrence of 33 species of ecto- and endoparasites. The present information deals with only five of these parasites, which are newly recorded monogeneans in Iraq.

The following is a brief account on the description and occurrence of these parasites.

Dactylogyrus rohdeianus Jalali, Papp *et* Molnár, 1995 (Fig. 1)

Dactylogyridae. Two pairs of head organs and four eye spots present. Body length 0.627-0.693 (0.660) mm, width 0.086-0.113 (0.100) mm. Marginal hooklets differ in size; the mean length of smaller ones is 0.025 mm and the larger ones 0.043 mm. Median anchors with constriction at the base of the spine. External (outer) root is less developed but the internal (inner) root is well developed. Length of median hook 0.042-0.045 (0.044) mm, outer root 0.006-0.007 (0.007) mm and inner root 0.018-0.019 (0.019) mm. Connecting bar with central cavity. Its width 25-27 (26) μ and length (without the central cavity) 3.3-4.0 (3.7) μ . Supplementary bar elongated, 26.5-27.5 (27) μ length and 5.2-6.5 (5.9) μ width. Copulatory organ is composed of a long tube with one turn supported by a rod-like and trough-like accessory pieces. Its length 55-64 (60) μ . Sclerotized vagina 26-30 (28) μ long, narrow bending tube starting from a funnel and ending in amorphous sclerotized structure.

The above description and measurements are similar to those reported for *D. rohdeianus* from *Capoeta damascina* of Chaghalnandi river, a tributary of river Karkheh, north to city Ahwaz, Iran (20). The present species was recorded from the gills of *B. luteus* and *B. sharpeyi* with a prevalence of 0.3 % and 0.4 %, respectively.

Diplozoon paradoxum Nordmann, 1832 (Fig. 2)

Diplozoidae. Two young worms fuse together at the middle of the body to form a cross like figure. Each individual differentiates into two portions; a foliate anterior portion containing vitellaria and bulk of intestine and a posterior portion containing genital complex and holdfast apparatus of the worm. The posterior portion is differentiated into three sections: anterior section carrying genital glands, midsection with terminations of intestinal trunk and posterior section (attaching disc) with ventral surface bearing attachment clamps.

Total body length of one of the two attached worms 3.9-5.2 (4.6) mm., maximum width 0.9-1.47 (1.2) mm. Ratio of anterior portion of body to posterior 1.5:1. Diameter of suckers of buccal cavity 0.08-0.15 (0.12) mm. Oesophagus 0.10- 0.15 (0.13) x 0.07-0.12 (0.10) mm. Mean length of median hook with its spike 0.028 mm., handle 0.07 mm. Width of first clamp 0.10-0.13 (0.12) mm. Width of each of the last three clamps 0.14-0.17 (0.16) mm. Egg longitudinal, apediculate, 0.29-0.33 (0.31) x 0.13-0.14 (0.14) mm.

The above description and measurements are similar to those reported by Bykhovskaya-Pavlovskaya *et al.* (15). This species was recorded in the present study from the gill of *B. luteus* with a prevalence of 0.3%.

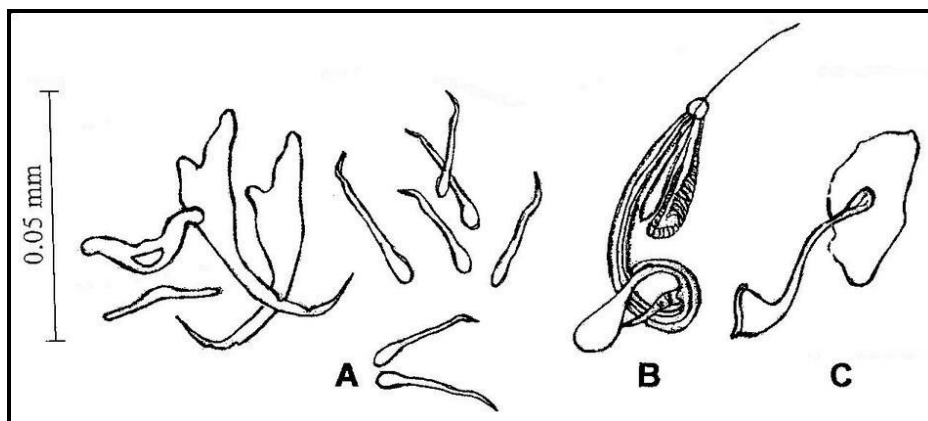


Fig. 1: Camera lucida drawings of *Dactylogyrus rohdeianus*. A- Haptor, B- Copulatory organ, C- Vagina.

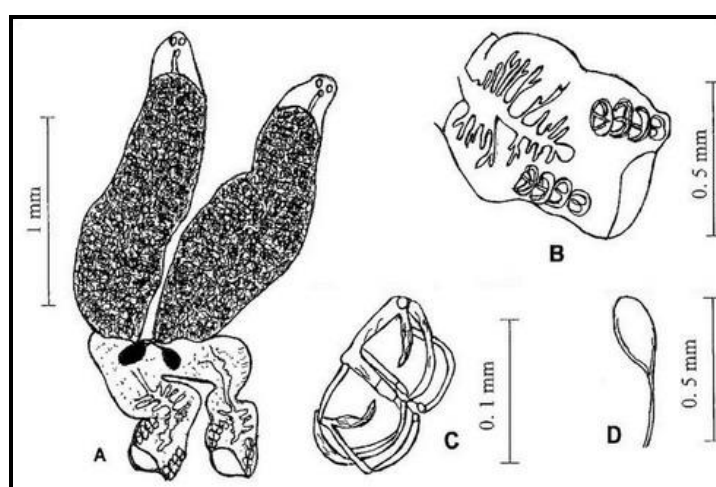


Fig. 2: Camera lucida drawings of *Diplozoon paradoxum*. A- Whole mount, B- Attaching disc, C- Clamp, D- Egg.

***Paradiplozoon homoion* (Bychowsky et Nagibina, 1959) (Fig. 3)**

Diplozoidae. Body length 3.1-4.8 (4.0) mm, width 0.8-1.1 (1.0) mm. Ratio of anterior portion of body to posterior 2-2.5:1. Diameter of suckers of buccal cavity 0.04-0.08 (0.06) mm. Oesophagus 0.05-0.09 (0.07) mm. Length of median hook with its spike 0.017 mm, handle 0.042 mm. Width of the first clamp 0.10-0.13 (0.12) mm. Width of each of the last three clamps 0.13-0.20 (0.17) mm. Egg oval, 0.23-0.29 (0.26) x 0.10-0.14 (0.12) mm.

The above description and measurements are similar to those reported by Bykhovskaya-Pavlovskaya *et al.* (15). This species was recorded in the present study from gills of *B. xanthopterus* with a prevalence of 0.6%.

***Paradiplozoon megan* (Bychowsky et Nagibina, 1959) (Fig. 4)**

Diplozoidae. Body length 3.7-7.3 (5.5) mm, width 1.3-1.9 (1.6) mm. Ratio of anterior portion of body to posterior 2.14-3.3:1. Diameter of suckers of buccal cavity 0.16-0.20 (0.18) mm. Oesophagus 0.10-0.15 (0.13) x 0.07-0.10 (0.09) mm. Length of median hook with its spike 0.025-0.028 (0.027) mm, handle 0.064-0.067 (0.066) mm. Width of the first clamp 0.12-0.19 (0.16) mm. Width of each of the last three clamps 0.23-0.34 (0.29) mm. Egg oval, 0.22-0.25 (0.24) x 0.10-0.13 (0.12) mm.

The above description and measurements are similar to those reported by Bykhovskaya-Povlovskaya *et al.* (15). The present *P. megan* was recorded in this study on gills of both *A. vorax* and *B. xanthopterus* with a prevalence of 0.5% and 0.3%, respectively.

***Paradiplozoon vojteki* (Pejčoch, 1968) (Fig. 5)**

Diplozoidae. Body length 2.2-6.3 (4.3) mm, width 0.7-0.8 (0.8) mm. Ratio of anterior portion of the body to posterior 1.6:1. Diameter of suckers of buccal cavity 0.06-0.11 (0.09) mm. Diameter of oesophagus 0.06-0.08 (0.07) mm. Length of median hook with its spike 0.02-0.021 (0.021) mm, handle 0.034-0.040 (0.037) mm. Width of the first clamp 0.09-0.13 (0.11) mm. Width of each of the last three clamps 0.13-0.23 (0.18) mm. Egg elongated 0.24 x 0.13 mm.

The above description and measurements are similar to those reported by Gussev (18). This species was recorded in the present study on gills of *B. xanthopterus* with a prevalence of 0.6%.

It is appropriate to mention here that the genus *Diplozoon* differs from *Paradiplozoon* in respect with the middle section of the posterior part of the body. This part is present in *Diplozoon* and absent in *Paradiplozoon* (18).

Finally, with the record of these trematodes from fishes of Iraq, the total number of dactylogyrids becomes 59 species. The diplozoids become nine species: three species of *Diplozoon*, one *Eudiplozoon* and five *Paradiplozoon* (25).

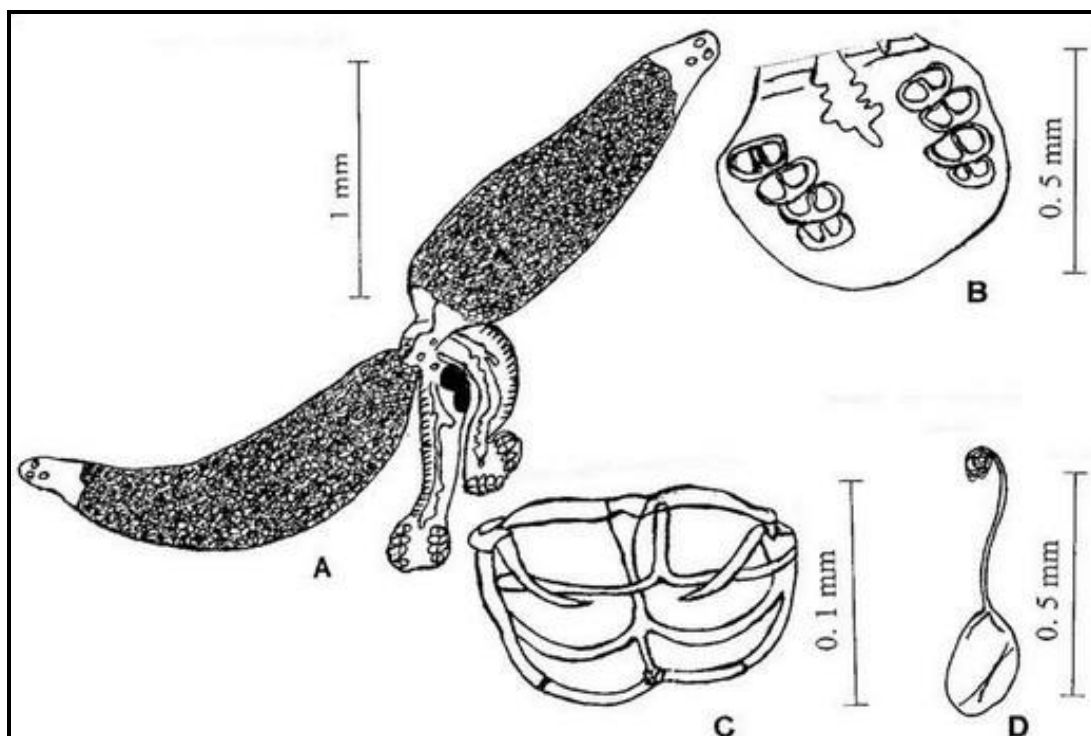


Fig. 3: Camera lucida drawings of *Paradiplozoon homoion*. A- Whole mount, B- Attaching disc, C- Clamp, D- Egg.

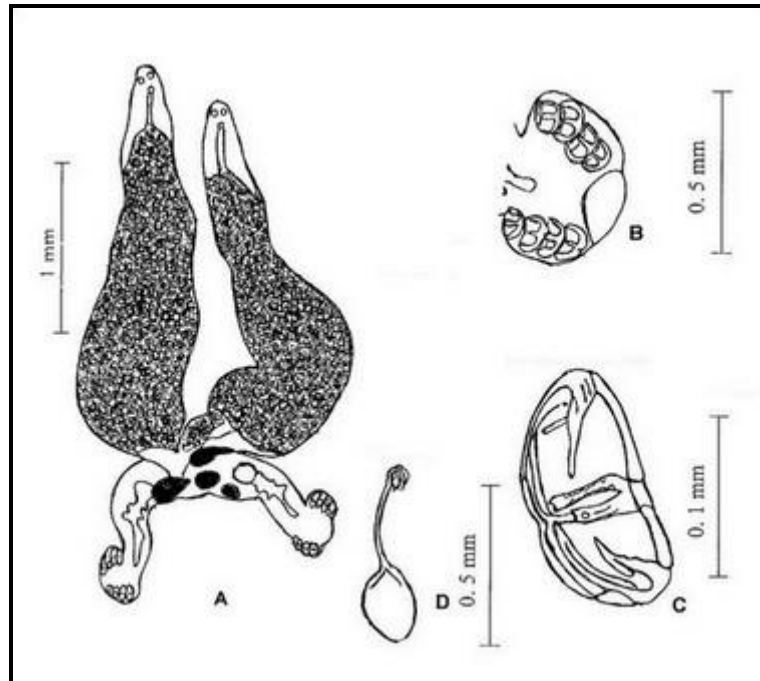


Fig. 4: Camera lucida drawings of *Paradiplozoon megan*. A- Whole mount, B- Attaching disc, C- Clamp, D- Egg.

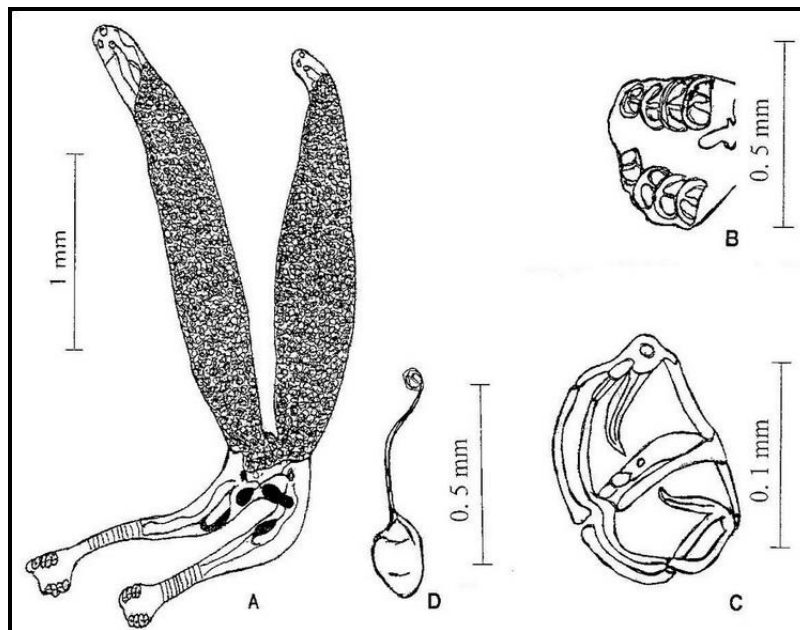


Fig. 5: Camera lucida drawings of *Paradiplozoon vojteki*. A- Whole mount, B- Attaching disc, C- Clamp, D- Egg.

REFERENCES

- 1- Abdul-Ameer, K. N. (1989). Study of the parasites of freshwater fishes from Tigris river in Salah Al-Dien province. M. Sc. Thesis, Univ. Baghdad, Iraq. (In Arabic).
- 2- Abdullah, S. M. A. (1990). Survey of the parasites of fishes of Dokan lake. M. Sc. Thesis, Univ. Salahaddin, Iraq. (In Arabic).
- 3- Abdullah, S. M. A. (2002). Ecology, taxonomy and biology of some parasites of fishes from Lesser Zab and Greater Zab rivers in north of Iraq. Ph. D. Thesis, Univ. Baghdad, Iraq. (In Arabic).

- 4- Abdullah, S. M. A. (2005). Parasitic fauna of some freshwater fishes from Darbandikhan lake, north of Iraq. J. Dohuk Univ., 8(1): 29-35.
- 5- Abdullah, S. M. A. (2008). First record of *Dactylogyrus fallax* (Monogenetic Trematoda) from *Chalcalburnus mossulensis* from Greater Zab river, Kurdistan region, Iraq. J. Dohuk Univ., 11(1): 57-61.
- 6- Al-Ali, Z. A. J. R. (1998). A study of some trematodes and its histopathological effects from three species of fish (family Cyprinidae) in Basrah province. M. Sc. Thesis, Univ. Basrah, Iraq. (In Arabic).
- 7- Ali, N. M.; A. R. Al-Jafery and K. N. Abdul-Ameer (1986). New records of three monogenetic trematodes on some freshwater fishes from Diyala river, Iraq. J. Biol. Scs. Res., 17(2): 253-266.
- 8- Ali, N. M.; N. E. Salih and K. N. Abdul-Ameer, K. N. (1987). Parasitic fauna of some freshwater fishes from Tigris river, Baghdad, Iraq. II: Trematoda. J. Biol. Sci. Res., 18(2): 19-27.
- 9- Al-Jadoaa, N. A. A. (2002). The parasitic infections and pathological changes of some local and cultured fishes from Al-Qadisiya and Babylon provinces. Ph. D. Thesis, Al-Qadisiya Univ., Iraq. (In Arabic).
- 10- Al-Saadi, A. A. J. J. (2007). Ecology and taxonomy of parasites of some fishes and biology of *Liza abu* from Al-Husainia creek in Karbala province, Iraq. ph. D. Thesis, Univ. Baghdad, Iraq. (In Arabic).
- 11- Al-Sa'adi, B. A.-H. E. (2007). The parasitic fauna of fishes of Euphrates river: Applied study in Al-Musaib city. M. Tech. Thesis, Found Technic. Educ. (In Arabic).
- 12- Amlacher, E. (1970). Textbook of fish diseases (Engl. Transl.). T. F. H. Publ., Jersey City.
- 13- Balasem, A. N.; N. R. Mohammad-Ali; T. K. Adday; A. K. Ali and I. K. Waheed (2000). Parasitological survey on fish in Hemrin dam lake, province of Diyala. J. Diyala, 1(8 part 1):104-114. (In Arabic).
- 14- Bilal, S. J. (2006). Parasitic fauna of some cyprinid fishes from Bahdinan river in Kurdistan region- Iraq. M. Sc. Thesis, Univ. Salahaddin, Iraq.
- 15- Bykhovskaya-Pavlovskaya, I. E.; A. V. Gusev; M. N. Dubinina; N. A. Izyumova; T. S. Smirnova; I. L. Sokolovskaya; G. A. Shtein; S. S. Shul'man and V. M. Epshtein (1962). Key to parasites of freshwater fish of the U. S. S. R. Akad. Nauk S. S. S. R., Moscow. (In Russian).
- 16- Coad, B. W. (1991). Fishes of the Tigris- Euphrates basin: A critical check- list. Syllogeus No. 68, Can., Mus. Nat.
- 17- Duijn, van C., Jnr. (1973). Diseases of fishes, 3rd ed., Iliffe Books, London.
- 18- Gussev, A. V. (1985). Parasitic metazoans: Class Monogenea. In: Key to the parasites of freshwater fish fauna of the U. S. S. R. Vol. 2. Ed. Bauer, O. N. Nauka, Leningrad. (In Russian).
- 19- Gussev, A. V.; N. M. Ali; K. N. Abdul-Ameer; S. M. Amin and K. Molnár (1993). New and known species of *Dactylogyrus* Diesing, 1850 (Monogenea, Dactylgyridae) from cyprinid fishes of the river Tigris, Iraq. Syst. Parasitol., 25: 229-237.
- 20- Jalali, B.; M. Papp and K. Molnár (1995). Four new *Dactylogyrus* species (Monogenea: Dactylogyridae) from Iranian fishes. Fol. Parasitol., 42: 97-101.

- 21- Jori, M. M. (1998). Study of the parasites of two mugilid species and the effect of some on the blood parameters. M. Sc. Thesis, Univ. Basrah, Iraq. (In Arabic).
- 22- Jori, M. M. (2006). Parasitic study on the Asian catfish *Silurus triostegus* (Heckel, 1843) from Al-Hammar marshes, Basrah, Iraq. Ph. D. Thesis, Univ. Basrah, Iraq.
- 23- Khamees, N. R. (1983). A study on the parasites of *Carasobarbus luteus* (Heckel), *Liza abu* (Heckel) and *Aspius vorax* Heckel from Mehaijran creek, south of Basrah. M. Sc. Thesis, Univ., Basrah, Iraq. (In Arabic).
- 24- Kritsky, D. C.; K. C. Pandey; N. Agrawal and S. M. A. Abdullah (2004). Monogenoids from the gills of spiny eels (Teleostei: Mastacembelidae) in India and Iraq, proposal of *Mastacembelocleidus* gen. n., and status of the Indian species of *Actinocleidus*, *Urocleidus* and *Haplocleidus* (Monogenoidea: Dactylogyridae). *Fol. Parasitol.*, 51: 291-298.
- 25- Mhaisen, F. T. (2008). Index-catalogue of parasites and disease agents of fishes of Iraq. (Unpublished).
- 26- Mhaisen, F. T.; A. N. Balasem; G. H. Al-Khateeb and K. P. Asmar (2003). Recording of five monogenetic trematodes for the first time from fishes of Iraq. *Bull. Iraq Nat. Hist. Mus.*, 10(1): 31-38.
- 27- Rahemo, Z. I. F. (1980). *Diplozoon kasimii* new species from a freshwater teleost fish, *Cyprinion macrostomus* Heckel. *Bull. Biol. Res. Cent.*, 12(1): 109-114.
- 28- Rasheed, A.-R. A.-M. (1989). First record of *Diplozoon barbi* Reichenbach-Klinke, 1951 from some freshwater fishes from Tigris river, Baghdad, Iraq. *Zanco*, 2(3): 5-15.

وصف خمسة مخرمات أحادية المنشأ لأول مرة من أسماك العراق

عبد علي جنزيل الساعدي* فرحان ضمد محيسن* هادي رسول حسن**

الملخص

تم جمع 2615 سمكة تعود لسبعة أنواع من جدول الحسينية، محافظة كربلاء في أثناء المدة من شهر آيار 2005 وحتى شهر نيسان 2006. كانت هذه الأسماك مصابة في 33 نوعاً من الطفيليات الخارجية والداخلية. من بين الطفيليات الخارجية، تم تسجيل خمسة أنواع من المخرمات الأحادية المنشأ لأول مرة من العراق. شملت هذه المخرمات أحادية المنشأ *Dactylogyrus rohdeinus* من غلاصم كل من أسماك الحمري والبنّي، *Diplozoon paradoxum* من غلاصم الحمري، *Paradiplozoon homoaion* من غلاصم الكطان، *P. megan* من غلاصم كل من الشلك والكطان و *P. vojteki* من غلاصم الكطان. تم توضيح الوصف الكامل مع قياسات وصور هذه الطفيليات.

البحث مستل من أطروحة دكتوراه للباحث الأول.

* كلية التربية (أبن الهيثم) - جامعة بغداد، بغداد، العراق.

** كلية التربية - جامعة كربلاء، كربلاء، العراق.