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ORIGINAL ARTICLE

FIRST RECORD OF TWO DIPLECTANID MONOGENOIDS FROM THREE SPARID FISHES IN IRAQI MARINE WATERS

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ABSTRACT

Parasitological examination of gills of three species of sparid fishes in the territorial waters of Iraq was performed, two diplectanid monogenoids were isolated and described; *Lamellodiscus indicus* Tripathi, 1959 from both Haffara seabream *Rhabdosargus haffara* (Forsskål, 1775) and Goldline seabream *R. sarba* (Forsskål, 1775) and *Protolamellodiscus senilobatus* Kritsky, Jiménez-Ruiz and Sey, 2000 from King soldierbream *Argyrops spinifer* (Forsskål, 1775). The record of the parasites is considered new to the parasite fauna of Iraq. The redescription of *L. indicus* for the first time which is collected from a new distribution area (Arabian Gulf). *R. haffara* is considered a new host record.

Keywords: Arabian Gulf, Fish, Iraq, Marine, Monogenoidea, Parasite.

INTRODUCTION

Member of Sparidae have 39 valid genera and 164 valid species in the world, 15 species of the genus *Argyrops* Swainson and six species of genus *Rhabdosargus* (Forsskål, 1775) (Fricke *et al*., 2022). It spreads from the tropical and temperate Atlantic, Indian and Pacific Oceans; chiefly marine; very rare in fresh- and brackish water; usually most common along the shore from shallow water (including estuaries) to deeper water as demersal inhabitants of the continental shelf and slope, most are carnivorous, feeding on benthic invertebrates feed on invertebrates, primarily mollusks and crustaceans; it is commercial food and game fish (Froese and Pauly, 2022).

King soldierbream *Argyrops spinifer* (Forsskål, 1775) distributes in the Indian Ocean: including the Red Sea and Arabian Gulf, to Singapore and the southernmost end of the Malay Peninsula; Goldline seabream *Rhabdosargus sarba* (Forsskål, 1775) occurs in the Indo-West Pacific: the Red Sea and East Africa to Japan, China, and Australia; Haffara seabream *Rhabdosargus haffara* (Forsskål) distributes in the Western Indian Ocean: Red Sea and especially common in the north (Froese and Pauly, 2022).

Few studies were carried out on the monogenoids of fishes in the Arabian Gulf; Hussey (1986) which isolated three species; *Tareenia acanthopagri* Hussey, 1986 [=*Benedenia acanthopagri* (Hussey, 1986)] and *Megalocotyloides epinepheli* (=*Allobenedenia epinepheli* (Bychowsky and Nagibina, 1967) (both Capsalidae), and *Polylabris angifer* Hussey 1986 (Microcotylidae) have reported from marine perciform fishes kept in culture tanks at Al-Raas, Kuwait; El-Naffar *et al*. (1992) pointed to record six genera belong to five families of monogenoidea from UAE coasts. Kritsky *et al*. (2000) recorded 17 species of Diplectanids from the gills of 17 species of marine fishes of Kuwait. Kardousha (2002) described three species of Capsala from the mackerel tuna *Euthynnus affinis*. Kardousha *et al.* (2002) detected two species of *Encotyllabe* from fishes in Qatar. Kritsky (2012) made a revision on Euryhaliotrema from Lutjanid fishes, and described *Euryhaliotrema seyi* Kritsky, 2012 from *Lutjanus russellii* in Arabian Gulf. Hassan *et al*. (2015) isolated *Benedenia acanthopagri* Hussey, 1986, from three fish hosts in Eastern Saudi Arabia.

A total of 253 parasite species have been known from 86 fish species from marine waters in Iraq, including 41 monogenoids species (Ancylodiscoididae 1, Ancyrocephalidae 9, Dactylogyridae 2, Diplectanipdae 5, Capsalidae 2, Gyrodactylidea 3, Axinidae 4, Chauhaneidae 1, Diplozoidae 2, Allodiscocotylidae 2, Heteraxinidae 1, Mazocraeidae 4, and Microcotylidae 5); Diplectanipdae has five taxa (three unidentified species from Sparidae), including *Diplectanum* sp. 1 and sp. 2, *Lamellodiscus iraqensis* Jassim & Al-Salim, 2020 and *Lamellodiscus* sp. 1 and sp. 2 (Mhaisen *et al*., 2018; Jassim and Al-Salim, 2020).

Due to the little attention in studies regarding the monogenoids parasites of marine fishes in Iraqi waters, the study aimed to diagnose some parasites that infect three species of commercially sparid fish.

MATERIALS AND METHODS

A total of 187 fish specimens of Sparidae, including 118 *Argyrops spinifer*, 31 *Rhabdosargus haffara* and 38 *R. sarba* were collected by local fishermen using trawl and drift gill nets from Iraqi marine waters (29°53'-29°85'N, 48°13 -48°40'E) during the period from January 2020 to December 2020 for parasitological examination. After which, the gill baskets were immediately removed and placed in vials containing a hot 60°C 5% formalin solution for relaxation and fixation of attached helminths. The vials were labelled and then shaken vigorously for 15-30 seconds. Sclerotised structures of several helminths were studied by mounting some specimens on microscope slides unstained in Gray and Weiss medium; other samples were stained with Gomori's trichrome or Mayer-Schuberg's Aceto carmine and mounted in Canada balsam on a slide to examine the delicate anatomical details (Kritsky *et al*., 1978; Humason, 1979; Palm, 2004). The illustrations were made using a camera Lucida mounted on a Leica compound microscope. All measurements are in micrometres, with a mean between parentheses. The host taxonomy was followed by Carpenter *et al*. (1997) and verified by Van der Laan *et al*. (2022).

RESULTS AND DISCUSSION

Lamellodiscus indicus Tripathi, 1959 (Fig. 1)

Description

Body slightly tapered anteriorly from the level of the testis; tegument smooth. The extended haptor is at least twice the width of the body. Cephalic margin broad; terminal; two weakly developed bilateral cephalic lobes; three poorly defined bilateral pairs of head organs. Eye spots four, those in the posterior pair are somewhat bigger than those in the anterior pair; members of the respective pairs are equally spaced apart. Mouth indistinct, subterminal on body midline anterior to pharynx; pharynx subspherical; oesophagus moderately long; intestinal caeca blind, terminating immediately anterior to lamellodiscs.

Ventral and dorsal lamellodiscs are similar, with ten lamellar rings lying diagonally within lamellodisc, the first ring complete ring; the remaining rings incomplete. Haptor was bilaterally lobed. Ventral anchor (Fig. 1B) with elongate subequal roots, curved shaft, and short recurved point. Dorsal anchor (Fig. 1C) with elongate deep root, knoblike superficial root, evenly curved shaft, short recurved point. Ventral bar (Fig. 1D) dorsoventrally flattened, with a variable medial indentation on posterior margin, long tapered ends, ventral groove. They have paired dorsal bars with a bifurcated medial end and are slightly curved-like near mid-length and dactylic appendages at external roots (Fig. 1E). Hooks similar; with protruding terminally depressed sickle, delicate toe and handle (Fig. 1I). The male copulatory organ (MCO) is situated posterior to caecal bifurcation and consists of three parts (Fig. 1F-H). Copulatory tube, proximal and distal parts of the accessory piece. The length of the copulatory tube is about 0.7 from the accessory piece length. The copulatory tube was slightly curved and articulated with both proximal and distal parts of the accessory piece (AP). AP is formed by two branches thick and joined by an articular base strongly curved inwards. Axial branch spatula form, almost perpendicular to the lateral. The lateral branch is finished at the tip. Prostatic reservoir lateral to MCO, opens posteriorly into the distal part of the copulatory tube. germarium pretesticular. Testis elongate oval, in the posterior half of the body, proximal vas deferens dorsoventrally looping around left intestinal cecum, distal vas deferens looping from left to right anterior. Seminal vesicle oval, prostatic reservoir fusiform beside left caecum at level of MCO. Seminal reservoir multilobes between the seminal vesicle and prostatic reservoir. Common genital pore ventral, slightly sinistral in a trunk at the level of the copulatory complex; genital atrium receiving distal ends of the uterus and male reproductive duct. Germarium pyriform, dorsoventrally looping around the right intestinal cecum. Oviduct short. Vitelline follicles at the intercaecal area between the pharynx and posterior ends of caeca.

Taxonomic summary

Type host: *Rhabdosargus haffara* and *R. sarba*.

Date of collection: *R. haffara* during January-February, May and December 2020; *R. sarba* during August-December 2020.

Infection site: Gill lamellae.

Minimum prevalence: 97% (30 of 31 *R. haffara* infected); 95% (36 of 38 *R. sarba* infected).

Voucher deposition: Iraq Natural History Research Center & Museum, INHM-TRC 21-25 from *R. haffara*; INHM-TRC 26-30 from *R. sarba*.

Currently, *Lamellodiscus* has 61 valid species (WoRMS, 2022a), mostly (56 species) described from Sparidae, four from Lethrinidae and one from Pomacanthidae (Machkewskyi *et al*., 2014; Kritsky and Bakenhaster, 2019; Nitta, 2021). Oliver (1987) divided the *Lamellodiscus* species based on lamellodisc shape into two groups: ignortatus and elegans, while he divided the *Lamellodiscus* species based on male copulatory organ (MCO) into three types: Lyre type, Double or forked piece type and Polymorphic type. *L. indicus* shares the characters of group elegans and polymorphous types. Justine and Briand (2010) added a new morphological group (tubulicornis) based on the structure of the lamellodisc from lethrinid fishes.

In Iraq, *Lamellodiscus iraqensis* Jassim and Al-Salim, 2020 has been described from Acanthopagrus arabicus from marine waters, however it considered invalid according to publication not compliant with Article 8.5 (2012) of the ICZN re e-publications (WoRMS, 2022b).

The description of current specimens from both *R. sarba* and *R. haffara* conspecific with the original description of *L. indicus* from *Sparus sarba* (= *Rabdosargus sarba*) of eastern India (Tripathi, 1959). Some measurements in the original description not given, e.g. outer and inner lengths of ventral and dorsal anchors, width of both bars, ventral and dorsal anchors, lamellodisc length, width and inner ring diameter, haptor width, hook length, MCO and accessary piece length. As well as the measurements of soft tissues in the original description are not measured, e.g. testis, germarium, seminal vesicle, seminal receptacle and prostate reservoir, therefore the current study redescribed the species based on sufficient specimens from two species of *Rhabdosargus* (See Table 1).

Machkewskyi *et al*. (2014) offered a checklist with all *Lamellodiscus* species and splitted them according to species groups of haptoral structures and MCO shape. The recent study also classified *Lamellodiscus* spp. were described from Sparoidea in related to host specificity, *L. indicus* considered that it has one host species (*R. sarba*), and here it considered has double closely host species (*R. sarba* and *R. haffara*); *R. haffara* considered new host record in the world for *L. indicus*. Minor differences in the measurements and description of *L. indicus* between two hosts were noticed such as; in general the measurements of all soft and hard parts of the parasite, e.g. the parasite from *R. haffara* bigger than that in *R. sarba*; the constriction between the trunk and the haptor is more distinct in *R. sarba* than in *R. haffara*. These differences come from intraspecific variations from different fish hosts (Rascalou and Justine, 2007; Al-Helli *et al*., 2019). On the other hand the measurements of Iraqi specimens of both hosts are found to be larger than that of the Indian specimens (see Table 1).

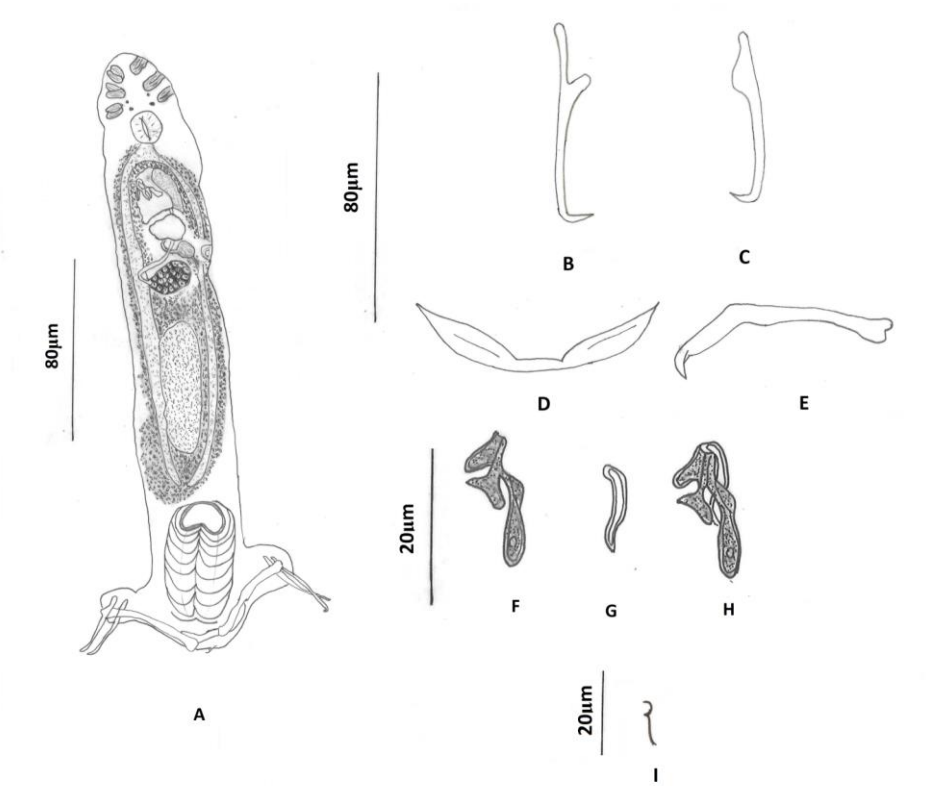

Figure (1): *Lamellodiscus indicus* from *Rhabdosargus haffara*; (A) Whole-body, (B) Ventral anchor, (C) Dorsal anchor, (D) Ventral bar, (E) Dorsal bar, (F) Accessory piece, (G) Copulatory tube, (H) MCO, (I) Hook.

Table (1): Measurements of *Lamellodiscus indicus* from two hosts of Sparidae off Iraq and compared with Indian materials from *R. sarba*. (Abbr. L: length, W: width).

Character	*R. sarba* Mean (Min-Max ± SD; N)	*R. haffara* Mean (Min-Max ± SD; N)	Indian specimens N= not given (Tripathi, 1959)
Body L.	454 (364-541±66; n=16)	495 (430-541±32; n=14)	391-433
Body W.	72 (60-97±11; n=16)	80 (68-95±7; n=14)	43-60
Pharynx W.	31 (25-40±5; n=8)	30 (24-38±5; n=12)	15-19
Haptor W.	146 (130-183±21; n=9)	153 (127-192±21; n=14)	-

Lamellodisc L.	78 (59-103±13; n=15)	87 (60-108±12; n=12)	-
Lamellodisc W.	58 (49-68±6; n=15)	64 (54-68±5; n=12)	-
Lamellodisc inner ring diameter	27 (24-30±3; n=15)	29 (27-30±1; n=12)	-
Ventral anchor inner L	46 (41-51±3; n=10)	47 (44-51±2; n=12)	41-57
Ventral anchor outer L	58 (51-65±4; n=12)	61 (57-65±3; n=13)	-
Dorsal anchor inner L.	38 (35-43±3; n=8)	39 (35-41±2; n=11)	-
Dorsal anchor outer L.	52 (49-56±2; n=9)	54 (51-57±2; n=12)	-
Ventral bar L.	64 (49-86±11; n=13)	77 (65-81±5; n=9)	41
Ventral bar W.	14 (11-21±3;n=7)	14 (14-16±1; n=9)	-
Dorsal bar L.	72 (54-84±9; n=23)	78 (65-84±6; n=20)	49-57
Dorsal bar W.	10 (8-12±2; n=6)	15 (14-19±2; n=12)	-
Hook L.	8 (8-11±1; n=7)	8 (7-10±1; n=14)	-
MCO	15 (13-15±1; n=12)	14 (13-15±1; n=12)	-
A. P.	27 (19-33±4; n=12)	26 (24-28±1; n=13)	-
Testis L.	86 (62-113±15; n=10)	112 (95-135±13; n=12)	-
Testis W.	41 (27-57±12; n=9)	41 (33-54±6; n=13)	-
Germarium W.	29 (24-48±7;n=11)	37 (35-43±3; n=11)	-

Protolamellodiscus senilobatus Kritsky, Jiménez-Ruiz & Sey, 2000 (Figs. 2)

Description

Body 765 (552-936±87; n = 24) long, slender, fusiform; greatest width 145 (111-203±24; n = 20) at level of the testis. The body tapering into the cephalic end; two terminal, two bilateral cephalic lobes poorly developed; three bilateral pairs of head organs with anterior and posterior pairs associated with respective cephalic lobes. Eye spots four; members of the posterior pair are slightly larger, closer together than the anterior one. Mouth subterminal, pharynx 56 (41-66±6, n = 20) wide, ovate oesophagus short to nonexistent; intestinal caeca blind.

Peduncle narrow, elongate. Haptor 143 (108- 170±18; n = 18) wide, with three bilateral pairs of lobes; Posterior lobes about twice the length of anterior lobes; lamellodiscs similar, each 36 (24-46±5; n = 25) long, 32 (24-42±5; n = 26) wide, with one complete, eight incomplete lamellae lacking medial indentation; lamellae appear to telescope in dorsoventral view. Ventral anchor 31 (18-36±5; n = 17) inner long and 39 (30-48±5; n=17) outer long, with unequal bifurcate roots, evenly curved shaft, point acutely recurved (Fig. 2B). Dorsal anchor 18 (14-26±4; n = 10) inner long and 39 (30-48±5; n=10) outer long, with elongated deep root, short thickened superficial root, and straight shaft (Fig. 2C). Ventral bar 48 (36-64±8; n =21) long, 17 (10-24±4; n=21) width, plate-like, with short knob at both ends (Fig. 2D); dorsal bar 46 (34-66±7; n= 21) long, 12 (6-20±4; n=21) width with medial curve, finger projection at proximal end (Fig. 2E). Hooks similar; each 11 (10-12±0; n = 12) long, with protruding slightly depressed thumb, delicate point and shank (Fig. 2G). The copulatory complex comprises an articulated male copulatory organ, an accessory piece. Male copulatory organ 43 (30-59±7; n = 35) long, heavily curved sclerotised tube with a recurved spine at the subterminal end, distal loop ending broadly; the base of the male copulatory organ without sclerotised end (Fig. 2F). The accessory piece is piece 28 (22-32±3; n=14). Long, comprising a flattened proximal portion, bifurcating striated branch, and spatulate branch frequently folded upon itself distally. Testis 65 (41-81±14; n =13) long, 42 (30-58±10; n =13) wide, ovate or elongate oval; vas deferens looping left intestinal caecum; seminal vesicle fusiform; prostatic reservoir saccate, lying anterior to copulatory complex. Germarium 36 (27-43±6; n=13) wide, slightly u shape, transversely, looping right intestinal caecum, pre testis; oviduct elongate; vagina short, nonsclerotized, with a proximal chamber containing apparent spermatophore, opening into the medial seminal receptacle; vitellaria dense throughout the trunk, from pharynx anteriorly to ending of caeca. Egg 51 (36-81±16; n=7) long, 27 (12-48±11; n=7) width tetrahedral with short filament 21 (16-26±7; n=2)

Taxonomic summary

Host: King soldier bream, *Argyrops spinifer*.

Date of collection: January-May 2020; August-December 2020.

Infection site: Gill lamellae.

Minimum prevalence: 50%

Voucher deposition: Iraq Natural History Research Center and Museum, INHM-TRC 31-35

Yamaguti (1953) described *Lammellodiscus convolutus* from *Synagris taeniopterus* (=*Nemipterus hexodon*) at Celebes. Euzet and Oliver (1965) isolated *L. serranelii* from

Serrranus cabilla and *S. scriba* of France. Oliver (1969) created new genus (*Protolamellodiscus*) and new subfamily Lamellodisconinae and emended of *Lamellodiscus serraneli* Euzet and Oliver, 1965 to be *P. serraneli* (Euzet and Oliver, 1965) Oliver, 1969. Young (1969) created and defined *Calydiscoides* and removed four species from *Lamellodiscus* and moved them to *Calydiscoides*, including *L. sernanelii* as *C. serraneli* (Euzet and Oliver, 1965) Young, 1969. Oliver (1987) moved *L. convolutus* Yamaguti, 1953 to *Protolamellodiscus* as *P. convolutes* (Yamaguti, 1953) Oliver, 1987. Oliver and Radujkuvic (1987) added *P. raibauti* from Yugoslavia and France. Kritsky *et al*. (2000) described *P. senilobatus* from A. *spinifer* and *A. filamentosus* at Kuwait. Justine (2007) examined museum specimens of *P. convolutes* (Yamaguti, 1953) Oliver, 1987 and he found the lamellodisc structure with seven concentric and telescopic lamellae and that the eggs are elongated with a short filament; therefore, he made a new combination as *Calydiscoides convolutes* (Yamaguti, 1953) Justine, 2007.

The current specimens are conspecific with *P. senilobatus* instead of *P. raibauti* (both species are known from Sparidae) due to their possessing of three pairs of haptoral lobes (no lobes in *P. raibauti*) and the subrectangular ventral bar (rod shape) and proximal spine on each of dorsal bar tip (no spine). *P. senilobatus* differs from *P. serranelli* by the shape and structure of MCO.

The description of the current specimens agrees with that of Kuwaiti specimens (Kritsky *et al*., 2000); however, all the measurements Iraqi specimens exhibited relatively smaller than Kuwaiti specimens (*A. spinifer*) except that of ventral and dorsal anchors; these minor variations in the description of both studies may be related to intraspecific differences in the time of collection and other ecological factors. In other hand although the wide range of the measurements of hard parts of this parasite between two hosts in the original description (Tab. 2), the current measurement from *A. spinifer* close to that from *A. filamentosus* instead of the type host (*A. spinifer*), this finding give the probability the misidentification in the host of at least in *A. filamentosus*, with *Argyrops flavops* Iwatsuki and Heemstra, 2018 (Iwatsuki and Heemstra, 2018) especially this host not distribute in the Arabian Gulf (Froese and Pauly, 2022).

Depending on the orientation and shape of telescoping lamellae in *Calydiscoides* and *Protolamellodiscus*, Kritisky *et al*. (2000) recommended to do further studies on these two closely genera, including phylogenetic analysis to resolve the validity or synonymy of *Protolamellodiscus* and *Calydiscoides*. Desdevises *et al*. (2001) designed the phylogeny tree for most genera and subfamilies of Diplectanidae, Domingues and Boeger (2008) established revision and phylogeny of all genera and subfamilies of the family and the two hyposes and got relatively similar results of recent work and concluded that although *Calydiscoides* and *Protolamellodiscus* close to each other they still have distinct characters to be valid genera.

Finally, the differences between *Calydiscoides* and *Protolamellodiscus* are unclear (Justine and Brena, 2009); although Justine (2007) explained that egg shape could be a key character in distinguishing between the two genera, with *Calydiscoides* possessing elongate eggs and

Protolamellodiscus possessing tetrahedral eggs. In addition, the former is restricted to hosts of the families Lethrinidae and Nemipteridae and the latter is restricted to the Sparidae and Serranidae.

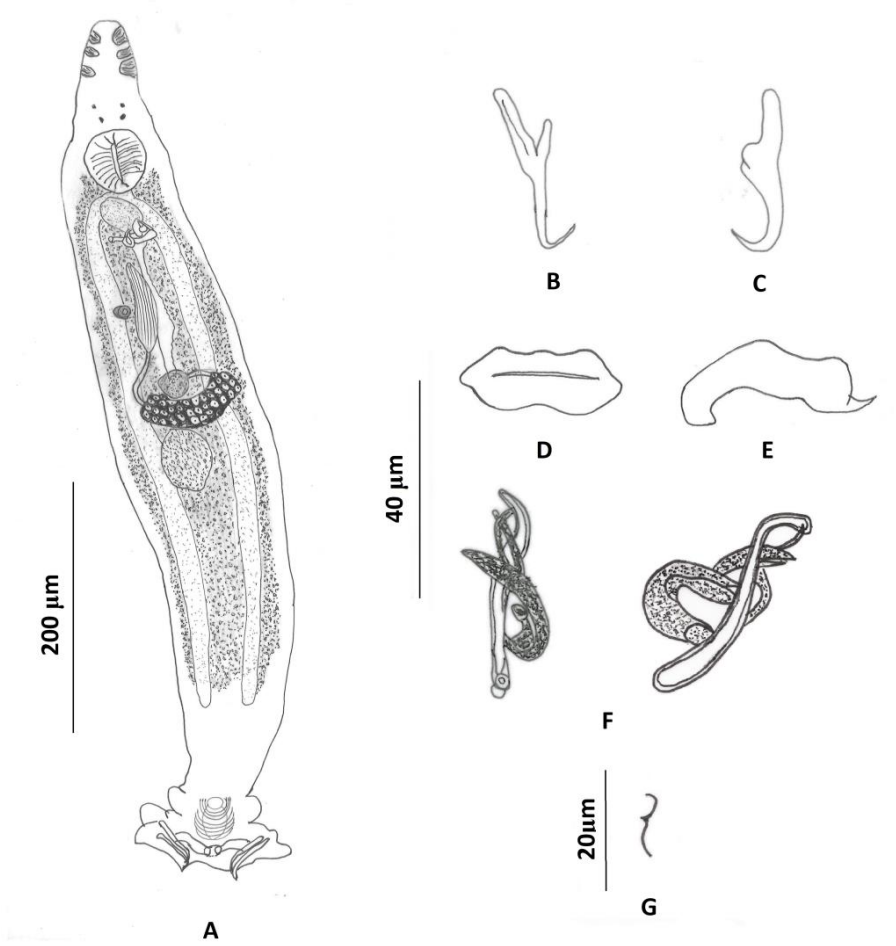

Figure (2): *Protolamellodiscus senilobatus* from *Argyrops spinifer*; (A) Whole-body, (B) ventral anchor, (C) Dorsal anchor D. Ventral bar, (E.) Dorsal bar, (F) Male copulatory organ with different views, (G) Hook.

Table (2): The comparative measurements of *P. senilobatus* between original description and current study. (Abbr. L: length, W: width).

Character	*A. spinifer* (Current study) Mean (Min-Max±; N)	*A. spinifer* (Kritsky *et al*., 2000) Mean (Min-Max±; N)	*A. filamentosus* (Kritsky *et al*., 2000) Mean (Min-Max±; N)
Body L.	765 (552-936±87; n=24)	1065 (720-1318; n=8)	714 (673-755, n=2)
Body W.	145 (111-203±24; n=20)	185 (120-240; n=9)	164 (148-179; n=2)
Pharynx W.	56 (41-66± 6; n=20)	73 (61-89±; n=10)	60 (51-70; n=2)
Haptor W.	143 (108-170± 18; n=18)	111 (104-117; n=8)	84 (79-89; n=2)
Lamellodisc L.	36 (24-46±5; n=25)	44 (37-53±; n=10)	37 (35-39; n=2)
Lamellodisc W.	32 (24-42± 5; n=26)	32 (29-38; n=10)	30 (29-31; n=2)
Lamellodisc inner ring diameter	14 (11-18, 2; n=26)	-	-
Ventral anchor inner L	31 (18-36± 5; n=17)	-	-
Ventral anchor outer L	39 (30-48± 5; n=17)	45 (38-49; n=11)	42- 43 (n=1)
Dorsal anchor inner L.	18 (14-26± 4; n=10)	-	-
Dorsal anchor outer L.	39 (30-48± 5; n=10)	41 (37-44; n=17)	35-36 (n=1)

Ventral bar L.	48 (36-64± 8; n=21)	41 (34-47; n=17)	36 (34-38; n=2)
Ventral bar W.	17 (10-24± 4; n=21)	-	-
Dorsal bar L	46 (34-66± 7; n=21)	40 (35-46; n=23)	36 (34-38; n=3)
Dorsal bar W.	12 (6-20± 4; n=21)	-	-
Hook L.	11 (10-12± 0; n=12)	10 (9-11; n=28)	9-10 (n=3)
MCO	43 (30-59± 7; n=35)	45 (38-53; n=22)	42-43 (n=1)
A. P.	28 (22-32± 3; n=14)	28 (18-34; n=16)	32-33 (n=1)
Testis L.	65 (41-81± 14; n=13)	107 (101-113; n=2)	-
Testis W.	42 (30-58± 10; n=13)	52 (48-55; n=2)	-
Germarium W.	36 (27-43± 6; n=13)	47 (44-56; n=5)	-
Egg	51 (36-81± 16; n=7) × 27 (12-48± 11; n=7)	-	-
Egg filament	21 (16-26± 7; n=2)	-	-

CONCLUSIONS

The occurrence of *L. indicus* from both *R. haffara* and *R. sarba* are considered the new parasite fauna of Iraq, as well as *L. haffara* considered new host record. The record of *P. senilobatus* from *A. spinifer* is considered a new record in Iraq.

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CONFLICT OF INTEREST STATMENT

".The authors have no conflicts of interest to declare"

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اول تسجيل لنوعين من الديدان احادية المنشأ (مجموعة Diplectanid) في ثلاثة انواع من اسماك الشانك في المياه البحرية العراقية

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الخلاصة

نتيجة الفحص الطفيلي لغلاصم ثلاثة انواع من اسماك الشانك في المياه البحرية العراقية، عزل و وصف نوعين من الديدان أحادية المنشأ *Lamellodiscus indicus* Tripathi, 1959، من غلاصم كل من سمك الشانك البحري الحفار *Rhabdosargus haffara* ومن سمك الشانك البحري ذهبي الخطوط *R. sarba* كما سجل النوع *Protolamellodiscus senilobatus* Kritsky, Jiménez-Ruiz and Sey, 2000 من غلاصم سمك العندك *Argyrops spinifer* (Forsskål, 1775) .

يعد تسجيل كلا الطفيلين اضافة جديدة الى طفيليات الاسماك في العراق؛ اعادة وصف النوع *L. indicus* تعد الاولى ومن منطقة انتشار جديدة (الخليج العربي). تعد سمكة الشانك البحري حفار مضيف جديد للطفيلي الأخير في العالم.