Checklists of *Gyrodactylus* Species (Monogenea) from Fishes of Iraq

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Abstract. Surveying the literature concerning the occurrence of the monogeneans of the genus *Gyrodactylus* parasitizing fishes of Iraq indicated that there are 25 nominated species of this genus on 29 fish species. These are: *G. baicalensis*, *G. barbi*, *G. ctenopharyngodontis*, *G. cyprini*, *G. derjavini*, *G. elegans*, *G. gobioninum*, *G. gussevi*, *G. katharineri*, *G. kherulensis*, *G. lavareti*, *G. longoacuminatus*, *G. macracanthus*, *G. malmbergi*, *G. markevitschi*, *G. medius*, *G. menschikowi*, *G. molnari*, *G.* aff. *mugili*, *G. salaris*, *G. shulmani*, *G. sprostonae*, *G. taimeni*, *G. vicinus* and *G. vimbi*. All these species infected freshwater fishes, except *G.* aff. *mugili* which infected two marine fishes found in brackish waters. In addition to these species, some unidentified specimens of this genus were reported from 15 fish hosts among which five fish species showed no infection with any of the above nominated species of *Gyrodactylus* while the others showed mixed infection. Such unidentified *Gyrodactylus* species were recorded from 12 freshwater fishes as well as three marine fishes found within the freshwaters of Basrah province. Among *Gyrodactylus* species, number of hosts ranged from one host for 15 *Gyrodactylus* species to a maximum of 23 hosts in case of *G. elegans*. The distribution of the infection ranged from one parasite species in 14 fish hosts to a maximum infection with 21 *Gyrodactylus* species in the common carp (*Cyprinus carpio*).

Key words: Monogenea, *Gyrodactylus*, freshwater fishes, marine fishes, Iraq.

Introduction

Monogeneans are small hermaphroditic worms that parasitize fishes and other aquatic animals. They infect fins, skin and gills of freshwater and marine fishes (59). The Class Monogenea includes 62 families, of which the family Gyrodactylidae has 34 genera. Among these genera, the genus *Gyrodactylus* has 518 nominated species of which 416 are valid species (91). However, number of *Gyrodactylus* species varies with varying references.

Gyrodactylids are amongst the smallest monogeneans and some are similar in size to oncomiracidium larvae (200mm). The fusiform body has a posterior opisthaptor armed with 16 marginal hooks and a pair of median hooks. Anteriorly, two conspicuous cephalic processes bearing adhesive glands are apparent with no eye spots. The transparent body is dominated by the F1 generation embryo curled within the uterus (50). They are remarkable in that they give birth to live young, which already have a developing embryo, in a 'Russian doll' arrangement (58). Gyrodactylids feed on mucus, epithelium and sometimes blood (66). Secondary infections of the epidermal lesions with bacteria or fungi may also play a significant role in the pathogenicity of

Gyrodactylus (58). The pathogenicity of *G. salaris* on some strains of Atlantic salmon *Salmo salar* became clear in the early 1970s, when this parasite was introduced into Norway with juvenile Atlantic salmon imported from Sweden for aquaculture (94).

In Iraq, the first gyrodactylid species, *G. elegans*, was reported from both *Cyprinus carpio* and *Liza abu* (21). Later on, extensive investigation on fish parasites from different parts of Iraq revealed the record of 24 additional species. These included *G. baicalensis* (98), *G. kherulensis* (27), *G. markevitschi* (1); *G. ctenopharyngodontis* (84), *G. malmbergi*, *G. medius*, *G. paralatus* (= *G. macracanthus*), *G. salaris*, *G. sprostonae* and *G. vicinus* (43); *G. gussevi* (4); *G. vimbi* (71), *G. derjavini* and *G. menschikowi* (44), *G. barbi*, *G. cyprini*, *G. gobioninum* and *G. longoacuminatus* (75), *G. lavareti* (2), *G. taimeni* (3), *G. molnari* (8), *G. katharineri* and *G. shulmani* (93) and *G.* aff. *mugili* (74).

Information concerning gyrodactylids infecting fishes of Iraq are scattered in different local scientific journals, M. Sc. and Ph. D. theses as well as in few conference abstracts. Some of such parasites have been misidentified or given with wrong authorities and some parasite names are misspelled. Some of the infected fishes were given in synonymous names. For these reasons, it was decided to review these data in accordance with list of fishes of Iraq (57) and with up-to-date fish scientific names (61), to correct scientific names and authorities of the concerned gyrodactylids according to some major taxonomical references and a web site (62, 96, 91), and to provide a host-gyrodactylid checklist.

Sources and Methods

A total of 83 references (research papers, conference abstracts and M. Sc. and Ph. D. theses) dealing with gyrodactylids of fishes of Iraq were used to prepare the present review and checklists. Data from such references was gathered to provide gyrodactylid list and host- gyrodactylid list. Names and authorities of these gyrodactylids are checked with the list of nominal species of *Gyrodactylus* (64) as well as with two taxonomical accounts (62, 96) and the well known specialized electronic sites (99, 91). For fishes, the scientific names were reported as they appeared in their original references and then checked with the recent account on freshwater fishes of Iraq (57). However, the valid names used here were based, with minor modifications, on a relevant electronic site (61).

Results and Discussion

Surveys Achieved on Gyrodactylids of Fishes in Iraq

The review of available literature indicated that since the first published account on fish parasites of Iraq (65) up till the first checklist of fish parasites of Iraq (78), no any gyrodactylid species was present from fishes of Iraq. Starting from 1984, when the first gyrodactylid species (*G. elegans*) was reported from two fish species (21) up to the present time, many surveys were achieved in different inland waters and fish farms and ponds which contributed in recording gyrodactylids from fishes of Iraq. These surveys

can be grouped into nine major categories according to localities of inspected fishes. These are:

1- Tigris River (26, 1, 56, 83, 10, 30, 31, 47) as well as some tributaries of Tigris River which included Greater and Lesser Zab rivers (4, 7), Lesser Zab River (75, 76, 93) and Diyala River (24, 25, 55, 87, 37).

2- Euphrates River and its branches (85, 15, 38, 44, 68).

3- Garmat Ali River, Basrah (70, 39, 72, 29) and Al-Salihiya River, Basrah (29).

4- Some lakes, depressions and marshes: These included surveys from Al-Tharthar region (73), Hemrin Dam Lake (54), Darbandikhan Lake (6, 8), Al-Qadisiya Dam Lake (49, 52), Al-Habbaniya Lake (82), Bahr Al-Najaf Depression (14, 16), Ibn-Najim Marsh (17, 63) and Al-Hammar Marsh (71).

5- Some drainage networks (51, 52, 47, 88).

6- Shatt Al-Arab Estuary in southern Iraq and Shatt Al-Basrah Canal (74).

7- Fish hatcheries (98, 80, 20, 32, 33, 75, 76).

8- Fish ponds and farms which included some from Kurdistan region (20, 5), Samarra region (73), man-made lakes at Al-Nibaey, north of Baghdad (23, 9), Al-Amiriya region, Baghdad (73, 34, 35), Al-Zaafaraniya Fish Farm, south of Baghdad (21, 19, 11, 12, 90, 13, 97, 48), some fish farms at Al-Medaen, south of Baghdad (48), Al-Wahda fish Farm at Al-Suwairah (98), Al-Latifiyah Fish Farm (21, 98, 89), two private sector fish farms at Al-Latifiyah region (89), Al-Furat Fish Farm, which was previously known as Babylon fish farm (27, 84, 79, 86, 43, 28, 41, 81, 42, 45, 18, 46), Al-Shark Al-Awsat fish farm, Babylon province (92, 67, 69), Technical Institte of Al-Mussayab Fish Farm (36), Earthern ponds at Saddat Al-Hindia district, Babylon province (40), Al-Aziziyah Fish Farm of Wasit Governorate (86) and Al-Dorah Fish Farm of Diyala Governorate (86) in addition to some floating cages at Al-Habbaniya Lake (22) and at Shatt Al-Hilla (40).

9- Some fish markets at Baghdad (41, 81, 42, 77, 2, 3).

Gyrodactylids Recorded from Fishes in Iraq

The review of literature indicated that a total of 25 nominated *Gyrodactylus* species are so far known from fishes of Iraq as well as some unidentified specimens of this genus. The following is an alphabetical list of such parasites. Gyrodactylid names and authorities are checked according to some major taxonomical accounts and web sites (62, 64, 96, 99, 91). The alphabetically arranged names of hosts for each parasite are quoted as they appeared in their original literature but the valid names have been updated according to Froese & Pauly (61) and the full authority of each valid fish host is shown in the host-gyrodactylid list. References of the records for each host within

each gyrodactylid species are chronologically arranged but references of the same year are alphabetically arranged.

1- *Gyrodactylus baicalensis* Bogolepova, 1950:

This parasite was recorded for the first time in Iraq from *C. carpio* from Al-Wahda Fish Farm at Al-Suwaira and from Al-Latifiyah Fish Farm (98). Now, it has eight hosts. These are: *Acanthobrama centisquama* (52), *Barbus sharpeyi*, which is a synonym of *Mesopotamichthys sharpeyi* (85, 49, 68), *Carasobarbus luteus* (23), *Carassius auratus* (47, 48), *Chondrostom regium* (83), *Cyprinion macrostomum* (23, 9), *C. carpio* (98, 22, 79, 80, 43, 11, 12, 49, 90, 28, 87, 52, 48, 77, 75, 76) and *L. abu* (83, 90, 53).

2- *Gyrodactylus barbi* Ergens, 1976:

This parasite was recorded for the first time in Iraq from *C. carpio* from Ainkawa fish hatchery, Erbil (75, 76). No more records for this parasite in Iraq are available.

3- *Gyrodactylus ctenopharyngodonti*s Ling in Gusev, 1962:

This parasite was recorded for the first time in Iraq from *Ctenopharyngodon idella* from Babylon (= Al-Furat) Fish Farm (84). It was then recorded only from the same fish of the same farm (43). It is appropriate to indicate here that the authority of this parasite was quoted as Lin, 1962 by the former reference (84) and as Ling, 1962 by the latter reference (43). Worldwide, PESI (95) quoted the authority as Ling, 1962, while MonoDB (91) quoted it as Ling Mo En, 1962 and Shin *et al.* (99) quoted it as Ling Mo-En, 1962. However, according to the personal communication between the senior author of this article and Dr. David I. Gibson of the British Museum (Natural History), it was decided to follow Harris *et al.* (64) who stated the authority as Ling in Gusev, 1962. Also, this parasite was quoted as *G. ctenopharyngodonis* instead of *G. ctenopharyngodontis* by some sources (96, 60).

4- *Gyrodactylus cyprini* Diarova, 1964:

This parasite was recorded for the first time in Iraq from *C. carpio* from Ainkawa fish hatchery, Erbil (75, 76). No more records for this parasite in Iraq are available.

5- *Gyrodactylus derjavini* Mikhailov, 1975

This parasite was recorded for the first time in Iraq from *Aspius vorax* from Hilla River (44). The authority of *G. derjavini* was given as Mikailov, 1975 by the researcher (44). No more records for this parasite are available.

6- *Gyrodactylus elegans* Nordmann, 1832:

This parasite was recorded for the first time in Iraq from fingerlings of *C. carpio* at Al-Zaafaraniya Fish Farm and *L. abu* from Al-Latifiya Fish Farm (21). Now, it has 23 hosts. These are: *A. centisquama* (26), *A. marmid* (83), *Alburnus orontis* (38), *A. vorax* (49), *Barbus belayewi*, which is a synonym of *Capoeta damascina* (30), *Barbus esocinus*, which is a synonym of *Luciobarbus esocinus* (49, 31), *Barbus grypus* (24, 25, 73), *B. luteus*, which is a synonym of *C. luteus* (14, 49, 90, 34, 97, 28, 53, 15, 16), *B. sharpeyi*, which is a synonym of *M. sharpeyi* (73, 85, 97, 28, 87, 37), *B. xanthopterus*, which is a synonym of *Luciobarbus xanthopterus* (24, 25, 28), *Capoeta trutta* (93), *C.*

auratus (47, 48), *C. carassius* (88), *C. regium* (83, 56, 87), *C. idella* (98, 43, 28), *C. macrostomum* (28, 68), *C. carpio* (21, 19, 98, 73, 79, 86, 89, 43, 10, 11, 12, 49, 90, 54, 92, 97, 55, 4, 20, 28, 41, 51, 87, 37, 47, 52, 88, 5, 7, 48, 6, 81, 42, 32, 36, 38, 33, 77, 40, 75, 76, 8), *Garra rufa* (83, 51), *Heteropneustes fossilis* (26, 56, 14, 16), *Hypophthalmichthys molitrix* (90, 28), *L. abu* (21, 19, 83, 14, 90, 34, 87, 15, 35, 88, 38, 16), *Mastacembelus mastacembelus* (82) and *Silurus triostegus* (31).

The rather long list of hosts recorded for *G. elegans* in Iraq comes in agreement with the statement that *G. elegans* represents one of the most widely cited *Gyrodactylus* species in the world and many host records are erroneous (64).

7- *Gyrodactylus gobioninum* Gusev, 1955:

This parasite was recorded for the first time in Iraq from *C. carpio* from Lesser Zab River (75, 76). No more records for this parasite in Iraq are available.

8- *Gyrodactylus gussevi* Ling, 1962:

This parasite was recorded for the first time in Iraq from *H. fossilis* from Greater Zab River (4, 7). Later on, it was reported only from the same fish from Euphrates River at Al-Musaib city (38). All the above references (4, 7, 38) quoted the authority of this species as Ling Mo-En, 1962 but the authority of Ling, 1962, used here, follows Harris *et al.* (64) and the personal correspondence with Dr. D. I. Gibson.

9- *Gyrodactylus katharineri* Malmberg, 1964:

This parasite was recorded for the first time in Iraq from *C. carpio* from Lesser Zab River (93). No more records for this parasite in Iraq are available. According to personal communication with Prof. Phil Harris of the Natural History Museum, University of Oslo, the scientific name was erroneously given as *G. katherineri* by MonoDB (91).

10- *Gyrodactylus kherulensis* Ergens, 1974:

This parasite was recorded for the first time in Iraq from *C. carpio* from Babylon (now Al-Furat) fish Farm (27). Now, it has three hosts in Iraq. These are: *C. idella* (43), *C. carpio* (27, 43, 11, 12, 75, 76) and *S. triostegus* (8).

11-*Gyrodactylus lavareti* Malmberg, 1957:

This parasite was recorded for the first time in Iraq from *C. carpio* from different fish markets in Baghdad city (2). No more records for this parasite in Iraq are available.

12- *Gyrodactylus longoacuminatus* Zitnan, 1964:

This parasite was recorded for the first time in Iraq from *C. carpio* from Ainkawa fish hatchery, Erbil (75, 76). No more records for this parasite in Iraq are available.

13- *Gyrodactylus macracanthus* Hukuda, 1940:

This parasite was recorded as *G. paralatus* Gussev, 1955 from both *C. carpio* and *H. molitrix* from Babylon (= Al-Furat) Fish Farm (43). Later on, it was reported, also as *G. paralatus*, only from *H. molitrix* (6). *G. paralatus* is a synonym of *G. macracanthus*

(62, 96). According to Harris *et al.* (64), *G. paralatus* is a mixture of *G. micracanthus* Hukuda, 1940 and *G. macracanthus* Hukuda, 1940.

14- *Gyrodactylus malmbergi* Ergens, 1961:
This parasite was recorded for the first time in Iraq from both *C. carpio* and *H. molitrix* from Babylon (= Al-Furat) Fish Farm (43). No more records for this parasite in Iraq are available.

15- *Gyrodactylus markevitschi* Kulakovskaya, 1952:
This parasite was recorded for the first time in Iraq from *Varicorhinus trutta*, which is a synonym of *Capoeta trutta*, from Tigris River at Baiji town, Salah Al-Dien province (1). The specific name was given as *markewitschi* and the authority as Kulakoaya by the same researcher (1). Now, it has five hosts. These are: *Aphanius dispar* (72), *B. grypus* (38), *C. trutta* (1), *Cyprinion kais* (38) and *C. carpio* (43, 67, 38, 69, 40).

16- *Gyrodactylus medius* Kathariner, 1895:
This parasite was recorded for the first time in Iraq from *C. carpio* from Babylon (= Al-Furat) Fish Farm (43). The year of authority of this parasite was erroneously given as 1893 instead of 1895 by the four concerned references (43, 4, 7, 38). Also, the authorship of this parasite was given as Katheriner instead of Kathariner (91). Now, this species has two hosts in Iraq. These are *B. luteus*, which is a synonym of *C. luteus* (38) and *C. carpio* (43, 4, 7).

17- *Gyrodactylus menschikowi* Gvosdev, 1950:
This parasite was recorded for the first time in Iraq from both *C. carpio* and *L. abu* from Hilla River (44). Later on, it was recorded only from *C. carpio* (40).

18- *Gyrodactylus molnari* Ergens, 1978:
This parasite was recorded for the first time in Iraq from both *C. carpio* from Darbandikhan Lake (8). No more records for this parasite in Iraq are available.

19- *Gyrodactylus* aff. *mugili* Zhukov, 1970:
This parasite was recorded from *Chelon subviridis* from the brackish waters of Shatt Al-Arab Estuary near Al-Fao town and from *Valamugil speigleri* near the dam on the Shatt Al-Basrah Canal (74). This is the only *Gyrodactylus* species which was so far recorded from marine fishes of Iraq within the brackish waters of Basrah province.

20- *Gyrodactylus salaris* Malmberg 1957:
This parasite was recorded for the first time in Iraq from *C. carpio* from Babylon (= Al-Furat) Fish Farm (43). Later on, it was reported only from the same host and the same fish farm (28). Both researchers (43, 28) reported the year of authority of this parasite as 1956 instead of 1957.

21- *Gyrodactylus shulmani* Ling, 1962:
This parasite was recorded for the first time in Iraq from *C. carpio* from Lesser Zab River (93). No more records for this parasite in Iraq are available. The authorship of

this parasite was given as Ling Mo En (99, 91) but according to the personal communication with Dr. David I. Gibson), it was decided to follow Harris *et al.* (64) who stated the authority as Ling, 1962.

22- *Gyrodactylus sprostonae* Ling, 1962:

This parasite was recorded for the first time in Iraq from *C. carpio* from Babylon (= Al-Furat) Fish Farm (43). Now, it has six hosts in Iraq. These are: *A. orontis* (38), *C. auratus* (8), *C. carassius* (38), *Chalcalburnus sellal*, which is asynonym of *Alburnus sellal* (38), *C. kais* (38) and *C. carpio* (43, 8). The authorship of this parasite was given as Ling Mo En (99, 91) but according to the personal communication with Dr. David I. Gibson), it was decided to follow Harris *et al.* (64) who stated the authority as Ling, 1962.

23- *Gyrodactylus taimeni* Ergens, 1971:

This parasite was recorded for the first time in Iraq from *C. carpio* from different fish markets in Baghdad city (3). No more records for this parasite in Iraq are available.

24- *Gyrodactylus vicinus* Bychowsky, 1957:

This parasite was recorded for the first time in Iraq from *C. carpio* from Babylon (= Al-Furat) Fish Farm (43). Now, it has three hosts in Iraq. These are: *B. luteus*, which is a synonym of *C. luteus* (34), *C. carpio* (43, 4, 7, 75, 76, 18) and *L. abu* (34, 35). The authorship of this parasite was given as Bykhovskii by all the above Iraqi references.

25- *Gyrodactylus vimbi* Shulman, 1954:

This parasite was recorded for the first time in Iraq from *S. triostegus* from Al-Hammar marsh (71). The researcher (71) reported the year of authority of this parasite as Shul'man, 1953 instead of Shulman, 1954. No more records for this parasite in Iraq are available.

Unidentified *Gyrodactylus* species:

In addition to the above mentioned nominated gyrodactylids, there are other records of gyrodactylids in Iraq which were unidentified to the species rank. These included the records from 15 fish hosts which included *A. marmid* (29), *Acanthopagrus latus* (29), *Alburnus mossulensis* (29), *A. vorax* (29), *B. luteus*, which is a synonym of *C. luteus* (17, 29), *B. sharpeyi* which is a synonym of *M. sharpeyi* (55), *C. auratus* (17, 29), *C. kais* (17), *C. macrostomum* (19), *C. carpio* (13, 45, 46), *L. abu* (70, 39, 29), *Liza subviridis*, which is a synonym of *Chelon subviridis* (70, 39), *S. triostegus* (71), *Tenualosa ilisha* (29) and *Tilapia zillii* (17, 63). It is appropriate to mention that the all the unidentified gyrodactylids mentioned here were recorded from freshwater fishes of Iraq, except specimens from *A. latus*, *L. subviridis* (= *Chelon subviridis*) and *T. ilisha* which were recorded from marine fishes while entering freshwaters of Basrah province (70, 39, 29).

Fish-Gyrodactylid List:

The following list shows which gyrodactylids are so far recorded from fishes of Iraq. Fish scientific names, both valid and synonymous, are alphabetically arranged. The full authorities of the valid hosts only are also cited according to Froese & Pauly (61). Gyrodactylid species reported from each valid fish species, together with gyrodactylids of fish synonym (when applicable) were gathered within the valid host and also alphabetically arranged. To minimize the size of this article, references for each gyrodactylid species from each host are not provided here. Such references can be easily obtained from the relevant gyrodactylid species mentioned earlier in this paper.

Acanthobrama centisquama Heckel, 1843: *G. baicalensis* and *G. elegans*.

Acanthobrama marmid Heckel, 1843: *G. elegans* and *Gyrodactylus* sp.

Acanthopagrus latus (Houttuyn, 1782): *Gyrodactylus* sp.

Alburnus mossulensis Heckel, 1843: *Gyrodactylus* sp.

Alburnus orontis Sauvage, 1882: *G. elegans* and *G. sprostonae*.

Alburnus sellal Heckel, 1843, reported as *Chalcalburnus sellal*: *G. sprostonae*.

Aphanius dispar (Rüppell, 1829): *G. markevitschi*.

Aspius vorax Heckel, 1843: *G. derjavini*, *G. elegans* and *Gyrodactylus* sp.

Barbus belayewi: See *Capoeta damascina*.

Barbus esocinus: See *Luciobarbus esocinus*.

Barbus grypus Heckel, 1843: *G. elegans* and *G. markevitschi*.

Barbus luteus: See *Carasobarbus luteus*.

Barbus sharpeyi: See *Mesopotamichthys sharpeyi*.

Barbus xanthopterus: See *Luciobarbus xanthopterus*.

Capoeta damascina (Valenciennes, 1842), reported as *B. belayewi*: *G. elegans*.

Capoeta trutta (Heckel, 1843), also reported as *Varicorhinus trutta*: *G. elegans* and *G. markevitschi*.

Carasobarbus luteus (Heckel, 1843), also reported as *Barbus luteus*: *G. baicalensis*, *G. elegans*, *G. medius*, *G. vicinus* and *Gyrodactylus* sp.

Carassius auratus (Linnaeus, 1758): *G. baicalensis*, *G. elegans*, *G. sprostonae*, *Gyrodactylus* sp.

Carassius carassius (Linnaeus, 1758): *G. elegans* and *G. sprostonae*.

Chalcalburnus sellal: See *Alburnus sellal*.

Chelon subviridis, also reported as *Liza subviridis*: *Gyrodactylus* aff. *mugili* and *Gyrodactylus* sp.

Chondrostoma regium (Heckel, 1843): *G. baicalensis* and *G. elegans*.

Ctenopharyngodon idella (Valenciennes, 1844): *G. ctenopharyngodonti*s, *G. elegans* and *G. kherulensis*.

Cyprinion kais Heckel, 1843: *G. markevitschi*, *G. sprostonae* and *Gyrodactylus* sp.

Cyprinion macrostomum Heckel, 1843: *G. baicalensis*, *G. elegans* and *Gyrodactylus* sp.

Cyprinus carpio Linnaeus, 1758: *G. baicalensis*, *G. barbi*, *G. cyprini*, *G. elegans*, *G. gobioninum*, *G. katharineri*, *G. kherulensis*, *G. lavareti*, *G. longoacuminatus*, *G. macracanthus* (reported as *G. paralatus*), *G. malmbergi*, *G. markevitschi*, *G.*

medius, *G. menschikowi*, *G. molnari*, *G. salaris*, *G. shulmani*, *G. sprostonae*, *G. taimeni*, *G. vicinus* and *Gyrodactylus* sp.

Garra rufa (Heckel, 1843): *G. elegans*.

Heteropneustes fossilis (Bloch, 1794): *G. elegans* and *G. gussevi*.

Hypophthalmichthys molitrix (Valenciennes, 1844): *G. elegans*, *G. macracanthus* (reported as *G. paralatus*) and *G. malmbergi*.

Liza abu (Heckel, 1843): *G. baicalensis*, *G. elegans*, *G. menschikowi*, *G. vicinus* and *Gyrodactylus* sp.

Luciobarbus esocinus Heckel, 1843, reported as *B. esocinus*: *G. elegans*.

Luciobarbus xanthopterus Heckel, 1843, reported as *B. xanthopterus*: *G. elegans.*

Mastacembelus mastacembelus (Banks & Solander, 1794): *G. elegans*.

Mesopotamichthys sharpeyi (Günther, 1874), reported as *B. sharpeyi*: *G. baicalensis*, *G. elegans* and *Gyrodactylus* sp.

Silurus triostegus Heckel, 1843: *G. elegans*, *G. kherulensis*, *G. vimbi* and *Gyrodactylus* sp.

Tenualosa ilisha (Hamilton, 1822): *Gyrodactylus* sp.

Tilapia zillii (Gervais, 1848): *Gyrodactylus* sp.

Valamugil speigleri (Bleeker, 1858): *Gyrodactylus* aff. *mugili*.

Varicorhinus trutta: See *Capoeta trutta*.

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قوائم مرجعية لأنواع الجنس *Gyrodactylus* (صنف أحادية المنشأ) من أسماك العراق

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الخلاصة. أظهر مسح المصادر المتعلقة بظهور الديدان أحادية المنشأ العائدة للجنس *Gyrodactylus* المتطفلة على أسماك العراق وجود 25 نوعا من هذا الجنس على 29 نوعا من الأسماك. وهذه الطفيليات هي: *G. baicalensis*، *G. barbi*، *G. ctenopharyngodontis*، *G. cyprini*، *G. derjavini*، *G. elegans*، *G. gobioninum*، *G. gussevi*، *G. katharineri*، *G. kherulensis*، *G. lavareti*، *G. longoacuminatus*، *G. macracanthus*، *G. malmbergi*، *G. markevitschi*، *G. medius*، *G. menschikowi*، *G. molnari*، *G.* aff. *mugili*، *G. salaris*، *G. shulmani*، *G. sprostonae*، *G. taimeni*، *G. vicinus* و *G. vimbi*. أصابت كل هذه الأنواع أسماك المياه العذبة، ماعدا النوع *G.* aff. *mugili* الذي أصاب نوعين من الأسماك البحرية المتواجدة في المياه الشروب. وبالإضافة لتلك الأنواع وردت بعض النماذج غير المشخصة من هذا الجنس على 15 مضيّفا سمكيا من بينها خمسة أنواع من الأسماك لم تظهر بها أية إصابة بأي من الأنواع المشخصة من ذلك الجنس، بينما أظهرت بقية الأسماك إصابات مزدوجة. وسجلت هذه الأنواع غير المشخصة من 12 نوعا من أسماك المياه العذبة وثلاثة أنواع من الأسماك البحرية المتواجدة في المياه العذبة في محافظة البصرة. تراوح عدد مضيفات الأنواع العائدة لهذا الجنس من مضيف واحد في حالة 15 نوعا من هذا الجنس إلى أقصى عدد وهو 23 مضيفا بالنسبة للنوع *G. elegans*. وتباين توزيع الإصابة بنوع طفيلي واحد في حالة 14 مضيّفا سمكيا إلى إصابة قصوى بـ 21 نوعا من هذا الجنس في الكارب الإعتيادي *Cyprinus carpio*.