

Checklists of Trematodes of Freshwater and Marine Fishes of Basrah Province, Iraq

Furhan T. Mhaisen¹, Najim R. Khamees² and Atheer H. Ali²

¹ Tegnergvägen 6B, 641 36 Katrineholm, Sweden

² Department of Fisheries and Marine Resources, College of Agriculture, University of Basrah, Basrah, Iraq
e-mail: mhaisenft@yahoo.co.uk

Abstract. The literature review on trematodes of freshwater and marine fishes of Basrah province, Iraq indicated the presence of 54 trematode taxa. Nineteen species of such trematodes were recorded from freshwater localities, while the remaining species were reported from marine localities. All these trematodes belong to the subclass Digenea except *Aspidogaster enneatus* which belongs to the subclass Aspidogastrea. All the reported trematodes are adults living in the stomach and/ or intestine of their hosts except *Transversotrema haasi* which was found in the skin, while eight species occurred as larval stages (metacercariae) in skin, gills or eyes of their hosts. The total number of trematode species for each fish host species fluctuated from a minimum of one trematode species in 13 fish hosts to 15 trematode species in *Silurus triostegus* only. Number of fish hosts reported for these trematodes fluctuated from one host in case of 32 species to 22 hosts in case of *Ascocotyle coleostoma*.

Key words: Trematoda, freshwater fishes, marine fishes, Basrah province, Iraq.

Introduction

In 1974, the International Congress of Parasitology agreed to separate what previously known as monogenetic trematodes and put them in a separate class of Monogenea (74). Hence, the group, previously known as digenetic trematodes, remained to include only the class Trematoda. Regrettably, the terms of monogenetic trematodes and digenetic trematodes are still in use in many Iraqi as well as some international literature.

With very few exceptions, trematodes include endoparasitic flat worms with non segmented body, closed digestive system, oral and ventral suckers and indirect life cycles. As adults, trematodes live inside various vertebrates and spend their larval stages in intermediate hosts, mainly snails but also in some fishes (76). Adult trematodes of fishes usually live in the digestive systems of their hosts but few live in the circulatory systems (58). Some trematodes live as larvae (metacercariae) in fish eyes (55), gills and skin and responsible for important fish diseases such as worm cataract, yellow grub and black spot disease (35, 44). Some trematodes can infect humans that eat metacercaria- infected fishes if such fishes are not cooked well or are not heavily salted (75).

The province of Basrah is the only province in southern Iraq which has an overlooking on the Arab Gulf. Different varieties of aquatic environments are met in this province which included the shallow marshy area in the north, Shatt Al-Arab River and its tributaries, Shatt Al-Basrah canal as well as the marine habitats of the northwest

part of the Arab Gulf (67). Such different environments facilitate the infection of different freshwater as well as marine fishes of Basrah with different trematodes as different intermediate and final hosts are available.

Information concerning trematodes of fishes of Basrah province are scattered in different local scientific journals and M. Sc. and Ph. D. theses. Some of this information is really outdated. Some parasites as well as some fishes have been misidentified, misspelled or quoted with wrong authorities. For these reasons, it was decided to review these data in accordance with up-to-date trematode classification using available web sites as well as some major taxonomic accounts and revise fish names to provide a host-trematode checklist in addition to the trematode list. This review is a continuation of previous literature reviews done on parasites of fishes of Basrah province (70, 63, 68). Finally, it was also planned to compare the richness of infected fishes of this province with trematodes with those of the whole Iraq based on data extracted from the index-catalogue of parasites and disease agents of fishes of Iraq (65).

Sources and Methods

A total of 38 references (research papers and M. Sc. and Ph. D. theses) dealing with trematodes of fishes of Basrah province were used to prepare the present review. Data from such references was gathered to provide trematode list and host- trematode list. The systematic account of these trematodes is based on the three volumes of keys to the Trematoda (47, 51, 40) as well as some available web sites (45, 77, 78). 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 (42). However, the valid names used here were based, with minor modifications, on a relevant electronic site (46). Some fish species were misidentified and hence marked with a question mark (?) in the text and their relevant names, based on two concerned textbooks (41, 42), are given in parenthesis in the text.

The index-catalogue of parasites and disease agents of fishes of Iraq (65) was used to show number of trematodes reported for each infected fish species in Basrah in comparison with that of whole Iraq as well as the richness of fishes of Basrah with trematodes in comparison with such richness in fishes of whole Iraq.

Results and Discussion

Surveys Achieved on Fish Trematodes in Basrah

Although the first report on parasites of fishes of Iraq (48) covered many parts of Iraq, there is no reference on any fish trematodes from Basrah province. Also, the first checklist of parasites of fishes of Iraq (61) included no any data on trematodes of Basrah fishes. Studies which reported trematode infections from fishes of this province can be grouped into four major categories according to the habitats of their fish hosts. These are:

- 1- The marshy area (Al-Hammar marsh) north of Basrah.

- 2- Shatt Al-Arab River and its tributaries and canals.
- 3- Fish farms scattered in Basrah province.
- 4- Marine waters of Khor Al-Zubair lagoon, Khor Abdullah and Khor Al-Ummaia, northwest of the Arab Gulf.

Surveys on fish trematodes from the marshy area of Basrah province were achieved in Al-Hammar marsh, north of Basrah (10, 72, 34, 53, 1). According to fishermen, fishes collected from both Basrah and Al-Ashar fish markets (62) were from Basrah marshy area.

Studies carried out on fishes of Shatt Al-Arab River and its creeks and canals included those from Shatt Al-Arab River at Basrah city (62), Mehaijeran Creek, south of Basrah city (56, 69), Al-Majidiah River, north of Basrah city (59, 19, 57, 60), Garmat Ali River, north of Basrah city (6, 52, 4, 29, 5, 30, 27, 26, 54, 24), Al-Salihiya canal (24, 28), Khora canal (54) and Shatt Al-Arab River near Nahr Khooz village (20, 31, 32).

Only one reference is known on trematodes from Basrah fish farms as well as from some aquarium fishes of Basrah province (26).

Reports on trematodes of marine fishes of Iraq included those from Khor Al-Zubair lagoon (11, 15), Khor Abdullah (12, 13, 17, 36, 14, 37, 38, 16, 73) and Khor Al-Ummaia (21).

Trematodes Recorded from Fishes of Basrah

The review of this literature indicated that a total of 54 trematode taxa belonging to two subclasses and 22 families, were recorded as indicated in Table (1). The classification of these trematodes is based on the three volumes of the CABI keys to the Trematoda (47, 51, 40). The trematode species are alphabetically presented under their families and genera. Notes on misspelling in names of some trematodes and their hosts, authorities and synonyms are corrected in accordance with information from some text books, electronic sites as well as some correspondence with authorities of the British Museum (Natural History), London. Names of hosts are quoted as they appeared in the reviewed literature but the valid names have been updated according to fishBase (46) and the full authority of each valid fish host is shown in Table (2).

Family Aspidogastridae

This family belongs to the superfamily Aspidogastrioidea. It is the only family of the subclass Aspidogastrea represented in Basrah fishes by only one valid species of the genus *Aspidogaster*.

Aspidogaster enneatus Eckmann, 1932 was reported only from *Aspius vorax*, *Carassobarbus luteus*, *Mesopotamichthys sharpeyi* and *Parasilurus triostegus* from Al-Hammar marsh (10). The specific name of this parasite, *enneatus*, was erroneously spelled as *enneatis* by the researcher (10) and corrected in accordance with a relevant

electronic site (78). *P. triostegus* is considered as a synonym of *Silurus triostegus* (46). The genus *Aspidogaster* includes 14 species, mostly freshwaters (78).

Family Bivesiculidae

This family belongs to the superfamily Bivesiculoidea. It is represented in Basrah fishes by only one valid species of the genus *Treptodemus*.

Treptodemus latus Manter, 1961 was recorded only from *Hemiramphus marginatus* from Khor Abdullah (37). *T. latus* is the only species reported for the genus *Treptodemus* (78).

Family Bucephalidae

This family belongs to the superfamily Bucephaloidea. It is represented in Basrah fishes by two valid species belonging to the genera *Bucephalus* and *Prosorhynchus*.

Bucephalus kaku Yamaguti, 1970 was recorded only from *Scomberomorus guttatus* from Khor Al-Zubair (11). The genus *Bucephalus* includes 74 accepted and 15 unaccepted species, mostly marines but some are freshwater and brackish water species (78).

Prosorhynchus epinepheli Yamaguti, 1939 was recorded only from *Epinephelus tauvina*? from Khor Al-Zubair lagoon (17). This species was reported as *Prosorhynchus* (P.) *epinepheli* by the above reference but the genus *Prosorhynchus* has no subgenera (47, 78). *E. tauvina* is not found in the Arab Gulf and it is probably misidentified with *E. coioides* (41). A total of 74 accepted and nine unaccepted species, mostly marines, are included in the genus *Prosorhynchus* (78).

Family Clinostomidae

This family belongs to the superfamily Clinostomoidea. It is represented in Basrah fishes by three valid species of the genus *Clinostomum*.

Clinostomum complanatum (Rudolphi, 1814) Braun, 1899 was recorded as metacercaria from 16 fish species in Basrah province. These are *Acanthobrama marmid* and *Alburnus mossulensis* both from Garmat Ali River and Al-Salihiya canal (24), *Aphanius dispar* from Shatt Al-Arab River (62), *A. vorax* from Mehajjeran Creek (56, 69), from Shatt Al-Arab River (62) and from Garmat Ali River (4), *C. luteus* and its synonym *B. luteus* (46), from Al-Ashar fish markets (62), from Mehajjeran Creek (56, 69) and from Garmat Ali River (6, 4, 29), *Carassius auratus* from Al-Salihiya canal (24), *Calchalburnus sellal*, as a synonym of *Alburnus sellal* (46), from Garmat Ali River (4), *Cyprinus carpio* from Garmat Ali River (4, 26), *Gambusia affinis*? which is considered as a misidentification with *G. holbrooki* (42) from Shatt Al-Arab River (62), *Heteropneustes fossilis* from Shatt Al-Arab River (62, 20), from Garmat Ali River (4) and from Al-Hammar marsh (72, 34), *Liza abu* from Garmat Ali River (52, 4, 26, 24) and Al-Majidiyah River (59), *L. subviridis*, which is a synonym of *Chelon subviridis* (46), from Garmat Ali River (52, 4), *Mastacembelus mastacembelus* from Garmat Ali

River (4), *Mystus pelusius* from Garmat Ali River (4), *Poecilia latipinna* from Garmat Ali River (24) and *S. triostegus* from Garmat Ali River (4) and from Al-Hammar marsh (53). Metacercariae of *C. complanatum*, the causative of the yellow grub disease, are widely distributed in freshwater fishes of Iraq as they have so far 22 fish hosts (65). Adults of this worm live in the mouth and pharynx of some fish-eating birds (44). Such adults were detected from two aquatic birds (*Ardea cinerea* and *Ardeola ralloides*) from Al-Hammar marsh in south of Iraq (21, 33). Some species of *Clinostomum* are known to have a public health importance (49). It is reliable to state here that the authority of *C. complanatum* in the above Iraqi literature was reported in different forms and as Rudolphi 1814 instead of 1819 by one website (78). However, Dr. David I. Gibson (pers. comm.) indicated that this authority should be Rudolphi, 1914 in brackets.

Clinostomum dasi Bhalerao, 1942 was recorded as metacercaria from *H. fossilis* from Shatt Al-Arab River (20). The first record of this parasite from Iraq was from the same fish from Diyala River, Baghdad (22). So far, only two hosts are known for *C. dasi* in Iraq (65). Adults of this worm were detected from the bittern *Botaurus stellaris* from Al-Hammar marsh in south of Iraq (21, 33).

Clinostomum phalacrocoracis Dubois, 1931 was recorded as metacercaria from six fish hosts in Basrah. These are *A. dispar* from Garmat Ali River (54), *A. mento* from Garmat Ali River (54), *A. vorax* from Al-Hammar marsh (10), *C. luteus* from Al-Hammar marsh (10), *L. abu* from Al-Hammar marsh (10) and *S. triostegus* from Al-Hammar marsh (1). *C. phalacrocoracis* has so far nine fish hosts in Iraq (65). Two immature specimens of *C. phalacrocoracis* were found in the Pygmy cormorant *Phalacrocorax pygmaeus* from Basrah (25).

Family Diplostomidae

This family belongs to the superfamily Diplostomoidea. It is represented by metacercariae belonging to one species of the genus *Diplostomum* and one unidentified species of the same genus.

Diplostomum spathaceum (Rudolphi, 1819) Olsson, 1876 was recorded as metacercaria from 15 fish hosts in Basrah. The authority of this parasite was not given in full in the Iraqi literature but as Rud. 1819 by one reference (4) and as (Rud., 1819) by two references (1, 24). The infected fishes included *A. marmid* from Garmat Ali River and Al-Salihiya canal (24), *Acanthopagrus latus* from Garmat Ali River (24), *A. mossulensis* from Garmat Ali River (24), *A. vorax* from Garmat Ali River (4; 24) and from Al-Salihiya canal (24), *B. luteus*, as a synonym of *C. luteus*, from Garmat Ali River (4, 24), *Barbus xanthopterus*, as a synonym of *Luciobarbus xanthopterus* (46), from Garmat Ali River (24), *C. auratus* from Garmat Ali River and Al-Salihiya canal (24), *C. sellal*, as a synonym of *A. sellal*, from Garmat Ali River (4), *C. carpio* from Al-Salihiya canal (24), *H. fossilis* from Garmat Ali River (4), *L. abu* from Garmat Ali River (4, 24) and from Al-Salihiya canal (24), *L. subviridis*, which is a synonym of *Chelon subviridis* from Garmat Ali River (24), *M. mastacembelus* from Garmat Ali

River (4), *M. pelusius* from Garmat Ali River (4) and *S. triostegus* from Al-Hammar marsh (1), Garmat Ali River (4) and from Al-Salihiya canal (24). Metacercariae of *D. spathaceum* were recorded for the first time in Iraq from *B. luteus* (= *C. luteus*), *C. carpio* and *Cyprinion macrostomum* from Dokan Lake (2). They are common in freshwater fishes of Iraq and are responsible for the worm cataract which causes fish blindness (64). So far 31 fish hosts are known for these metacercariae in Iraq (65). The adult worm lives in the intestine of fish-eating birds (44, 76). The whole life cycle of this parasite was experimentally demonstrated in Iraq (3) by using snails (two species of *Lymnaea*), fishes (*Cyprinion macrostomum* and *C. carpio*) and aquatic bird (*Larus canus*). Two gull species (*Larus canus* and *L. ichthyaetus*) from Shatt Al-Arab River were found infected with the adults of this parasite (71). The infection of the black-headed gull *L. ridibundus* with adults of *D. spathaceum* from Basrah was noticed (18). *L. ridibundus* was also infected with the adults of this worm from Al-Baghdadi town, mid Iraq (7). However, Ali (21) concluded that the latter worms belong to *D. pseudospathaceum*. The silver gull *L. argentatus* was found infected with adults of this parasite in Bahr Al-Najaf depression, mid Iraq (9). In England, metacercariae of *D. spathaceum* was found in lens cataracts of a 5-month-old child and a 55-year-old fisherman (49).

In addition to *D. spathaceum*, unidentified metacercariae of *Diplostomum* sp. were recorded from seven fish species from Basrah province. These fishes are: *A. dispar* and *A. mento* both from Garmat Ali River (54), *A. vorax* and *B. luteus* (= *C. luteus*) from Garmat Ali River (6), *C. carpio* from Garmat Ali River (6, 30) as well as both *G. holbrooki* and *P. latipinna* from Garmat Ali River (54). A total of 25 fish species were so far reported as hosts for some unidentified *Diplostomum* species in Iraq (65). The genus *Diplostomum* includes 18 accepted species which are found in marine, freshwater and terrestrial environments (78).

Family Strigeidae

This family belongs to the superfamily Diplostomoidea. Unidentified metacercarial specimens belonging to this family were reported from three fish species: *A. vorax*, *B. luteus* (= *C. luteus*) and *C. carpio* from Garmat Ali River (6, 29) as well as from *L. abu* from Al-Majidiah River (59, 19, 57, 60).

Family Fellodistomidae

This family belongs to the superfamily Gymnophalloidea. It is represented in Basrah fishes with two valid species belonging to genera *Proctoeces* and *Tergestia*.

Proctoeces maculatus (Looss, 1901) Odhner, 1911 was recorded only from *S. triostegus* from Al-Hammar marsh (53). The genus *Proctoeces* includes 14 accepted and six unaccepted marine species and among these, *P. maculatus* has four synonymised taxa (78).

Tergestia pauca Texeira de Freitas & Kohn, 1965 was recorded only from *Scomberoides commersonnianus* from Khor Abdullah (36). The authority of this parasite was given as Fretas & Kohn, 1965 by the above researcher (36) and it is given here in accordance with two electronic sites (45, 78). The genus *Tergestia* includes 15 accepted and nine unaccepted species (78).

Family Tandanicolidae

This family belongs to the superfamily Gymnophalloidea. It is represented in Basrah fishes with one valid species belonging to the genus *Monodharmis*.

Monodharmis torpedinis Dollfus, 1937 was reported as *Monodharmis philippinensis* Velasquez, 1961 only from *S. triostegus* from Al-Hammar marsh (53). *M. philippinensis* is unaccepted name and the accepted name is *M. torpedinis* (78). The genus *Monodharmis* includes eight accepted species among which *M. torpedinis* which has five synonyms (78).

Family Hemiuridae

This family belongs to the superfamily Hemiuroidea. It is the biggest family parasitizing Basrah fishes as it is represented with 16 taxa belonging to eight genera.

Ectenurus piscicola (Srivastava, 1935) was erroneously reported as *Clupenurus piscicola* Srivastava, 1935 from *Ilisha elongata*? from Khor Al-Zubair lagoon (11). *I. elongata* is not found in the Arab Gulf and it is probably misidentified with *Ilisha compressa* (41). *Clupenurus* is considered as a synonym of *Ectenurus* (47, 78). The genus *Ectenurus* includes 28 accepted and six unaccepted species (78).

Unidentified species of *Ectenurus* was also reported from *Scomberomorus commerson*?, misspelled as *S. commersons*, from Khor Abdullah (36). It is important to state here that the researcher (36) has applied a wrong scientific name for the infected fish locally known as Khubbat as *S. commerson* while the correct name is *S. guttatus* (41).

Erilepturus gazzi (Ahmed, 1980) Madhavi, 2011 was reported under its synonym, *Uterovesiculurus gazzi* Ahmed, 1980, from *Chirocentrus nudus*, *Thryssa hamiltonii* and *T. mystax*? (misapplied name for *T. whiteheadi*) from Khor Al-Zubair lagoon (11). *T. hamiltonii* was erroneously spelled as *T. hamiltoni* by the above researcher (11). *T. mystax* is a misapplied name for *Thryssa whiteheadi* as *T. mystax* is not found in the Arab Gulf (41). The genus *Uterovesiculurus* is a synonym of *Erilepturus* (47, 78).

Erilepturus hamati (Yamaguti, 1934) Manter, 1947 was recorded only from *Eleutheronema tetradactylum*, *Otolithes ruber* and *Pseudorhombus arsius* from Khor Al-Ummaia (21). The generic name of *E. tetradactylum* was misspelled as *Euthylonema* and the generic name of *P. arsius* was misspelled as *Pseudoromphus* (21). As the genus *Uterovesiculurus* is a synonym of *Erilepturus* (47, 78), *U. hamati* reported from *O. ruber* from Khor Abdullah (36) is considered here as a synonym of *E. hamati*.

The generic name *Otolithes* was misspelled as *Otolithus* by the latter researcher (36). *E. hamati* has 25 synonyms which included 11 species of the genus *Urovesiculurus* (78).

The unidentified species of *Uterovesiculurus*, reported from *C. nudus*, *T. hamiltonii* and *T. mystax*? (misapplied name for *T. whiteheadi*) from Khor Al-Zubair lagoon (11) and *Uterovesiculurus* sp. 1 and sp. 2 from *Johnius belangerii* from Khor Abdullah (36) are considered here as *Erilepturus* species as the genus *Uterovesiculurus* is a synonym of *Erilepturus* (47, 78). The genus *Erilepturus* has 24 accepted and 13 unaccepted species (78).

Hemiurus communis Odhner, 1905 was recorded from six fish species: *A. vorax*, *B. luteus* (= *C. luteus*), *H. fossilis*, *M. mastacembelus*, *M. pelusius* and *S. triostegus* which are all from Garmat Ali River (4). It is adequate to mention here that *H. communis* is a marine species (78) while all the above named fishes are freshwater fishes. The genus *Hemiurus* has 13 accepted and seven unaccepted species (78).

Hemiurus sigani Fischthal & Kuntz, 1964 was recorded only from *S. triostegus* from Al-Hammar marsh (53). *H. sigani* is a marine species (78) while *S. triostegus* is a freshwater fish.

Hypohepaticola sp. was recorded only from *Saurida undosquamis* from Khor Abdullah (36). The genus *Hypohepaticola* has three valid marine species (78).

Lecithochirium acutum Chauhan, 1945 was recorded only from *Trichiurus lepturus* from Khor Al-Ummaia (21).

Unidentified species of *Lecithochirium* were reported from three fish species from Khor Al-Zubair lagoon (11). These were *Johnius (Johnieops) sina* which is a synonym of *J. dussumieri* (46), *Johnius (J.) belangerii* which is a synonym of *J. belangerii* (46) and *Liza subviridis* (= *Chelon subviridis*). Also, *Lecithochirium* sp. was reported from *O. ruber* from Khor Abdullah (36). The generic name *Otolithes* was misspelled as *Otolithus* by the latter researcher (36). The genus *Lecithochirium* includes 131 accepted and six unaccepted species (78).

Lecithocladium bulbolabrum Reid, Coil & Kuntz, 1966 was recorded only from *Parastromateus niger* from Khor Abdullah (73). The researcher (73) did not mention the authority of this species in his article. The genus *Lecithocladium* includes 57 accepted and 24 unaccepted species (78).

Saturnius hadithii Al-Daraji, 2004 was described as a new species from *L. macrolepis*, which is a synonym of *C. macrolepis* (46), from Khor Abdullah (14). This species is not enlisted within the eight valid marine species of *Saturnius* (39, 78). The search in the net failed to detect such taxon.

Saturnius segmentatus Manter, 1969 was recorded only from *L. macrolepis* (= *C. macrolepis*) from Khor Abdullah (14). Personal communication between one of us

(AHA) and Dr. D. I. Gibson on 4th May 2012 revealed that this is not *S. segmentatus* as no papillae on oral ridge were described or figured and the five septa in the hindbody should be four thick in hindbody plus one in the forebody. While revising the genus *Saturnius* (39), a redescription of this species was done.

Saturnius valamugilis Rekharani & Madhavi, 1985 was recorded only from *L. macrolepis* (= *C. macrolepis*) from Khor Abdullah (14). As this species was originally inadequately described on the basis of two specimens in poor condition, it was considered as a *species inquirenda* while revising all the species of the genus *Saturnius* (39).

Unidentified species of *Saturnius* sp. was reported only from *L. subviridis* (= *C. subviridis*) from Khor Al-Zubair lagoon (11). The genus *Saturnius* includes eight accepted marine species which included both *S. segmentatus* and *S. valamugilis* (78).

Tubulovesicula magnacetabulum Yamaguti, 1939 was reported only from *E. tauvina*? (misapplied for *E. coioides*), from Khor Abdullah (17). The genus *Tubulovesicula* includes 24 accepted and one unaccepted species (78).

Family Transversotrematidae

This family belongs to the superfamily Transversotrematoidea. This family is represented in Basrah fishes with one valid species belonging to the genus *Transversotrema*.

Transversotrema haasi Witenberg, 1944 was reported only from the skin of *L. subviridis* (= *C. subviridis*) from Khor Al-Zubair lagoon (11). The specific name of this parasite was misspelled as *hassi* instead of *haasi* by the above researcher (11). The genus *Transversotrema* includes 24 accepted species (78).

Family Haploporidae

This family belongs to the superfamily Haploporoidea. It is represented in Basrah fishes with three species belonging to genera *Carassotrema*, *Lecithobotrys* and *Saccocoelium*.

Carassotrema lizae Al-Daraji, 1999 was described as a new species from *L. macrolepis* (= *C. macrolepis*) from Khor Abdullah (13). This species is not enlisted within the three valid marine species of *Carassotrema* (78). The search in the website failed to detect any information about this taxon apart from the citation of reference (13) within the bibliography provided for the book of freshwater fishes of Iraq (42). Most, but not all species in *Carassotrema*, infect freshwater fishes, primarily cyprinids, and only *C. estuarinum* and *C. bengalense* have been reported from estuarine mullets (51).

Lecithobotrys mhaiseni Al-Daraji, 1998 was described as a new species from *L. subviridis* (= *C. subviridis*) from Khor Abdullah (12). This species is not enlisted within the genus *Lecithobotrys* which included two accepted species, three unaccepted species and one *species inquirenda* (78). The search in the website failed to detect any

information about this taxon apart from the citation of the reference (12) within the bibliography provided for the book of freshwater fishes of Iraq (42).

Saccocoelium tensum Looss, 1902 was reported from *Liza carinata* and *L. subviridis* (= *C. subviridis*) from Khor Al-Zubair lagoon (11). This species is enlisted within the four marine and one brackish accepted species of the genus *Saccocoelium* (78).

Family Haplospilachnidae

This family belongs to the superfamily Haplospilachnoidea. It is represented in Basrah fishes with two species belonging to genera *Haplospilachnus* and *Schikhobalotrema*.

Haplospilachnus mugilis Nahhas & Cable, 1964 was reported only from *L. subviridis* (= *C. subviridis*) from Khor Abdullah (38). This species is enlisted within the genus *Haplospilachnus* which included 15 accepted and four unaccepted marine species (78).

Schikhobalotrema indicum (Zhukov, 1972) Overstreet & Curran, 2005 was reported as *Chauhanotrema spiniacetabulum* Nahhas & Sey, 1998 from *H. marginatus* from Khor Abdullah (37). The authority of *C. spiniacetabulum* was given as Nahhas *et al.*, 1997 by the researchers (37). *C. spiniacetabulum* is considered as a synonym of *S. indicum* (51, 78). The genus *Schikhobalotrema* includes 26 accepted and three unaccepted species (78).

Family Allocreadiidae

This family belongs to the superfamily Allocreadioidea. It is represented in Basrah fishes with one valid species belonging to the genus *Allocreadium*.

Allocreadium isoporum (Looss, 1894) Looss, 1900 was reported from five fish species from Garimat Ali River (4). These fishes are: *B. luteus* (= *C. luteus*), *H. fossilis*, *M. mastacembelus*, *M. pelusius* and *S. triostegus*. The first record of this species in Iraq was from *Mystus halepensis*, which is a synonym of *M. pelusius* (46), from Tigris River at Baghdad (23).

Family Opacoelidae

This family belongs to the superfamily Allocreadioidea. It is represented in Basrah fishes with two valid species of the genus *Helicometrina* as well as unidentified species of the same genus.

Helicometrina karachiensis Bilqees, 1977 was reported from *J. (Johnieops) sina* (= *J. dussumieri*) and *O. ruber* from Khor Al-Zubair lagoon (11). The year of authority was given as 1972 by the researcher (11) and corrected here in accordance with a specialized website (50). The generic name *Otolithes* was misspelled as *Otolithus* by the above- named researcher (11). This species is not enlisted within the seven valid species of the genus *Helicometrina* (78).

Helicometrina otolithi Bilqees, 1972 was reported from *O. ruber* from Khor Al-Zubair lagoon (11). The generic name *Otolithes* was misspelled as *Otolithus* by the researcher (11). This species is not enlisted within the seven accepted species of the genus *Helicometrina* (78).

Unidentified species of *Helicometrina* were reported from both *J. (Johnieops) sina* (= *J. dussumieri*) and *Johnius (J.) belangerii* (= *J. belangerii*) from Khor Al-Zubair lagoon (11). The genus *Helicometrina* includes seven accepted and five unaccepted marine species (78).

Family Opistholebetidae

This family belongs to the superfamily Allocreadioidea. It is represented in Basrah fishes with one unidentified species of the genus *Opistholebes*.

Opistholebes sp. was reported only from *A. latus* from Khor Al-Zubair lagoon (11). The genus *Opistholebes* includes five accepted marine species (78).

Family Acanthocolpidae

This family belongs to the superfamily Lepocreadioidea. It is represented in Basrah fishes with two species belonging to genera *Pleorchis* and *Stephanostomum*.

Pleorchis arabicus Al-Yamani & Nahhas, 1981 was reported from *J. (Johnieops) sina* (= *J. dussumieri*), *J. (J.) belangerii* (= *J. belangerii*) and *O. ruber* from Khor Al-Zubair lagoon (11). The generic name *Otolithes* was misspelled as *Otolithus* by the researcher (11). *P. arabica* is enlisted within the 15 accepted species of the genus *Pleorchis* (78).

Stephanostomum sp. was reported from *Nematalosa nasus* from Khor Al-Zubair lagoon (11) and from *S. commersonnianus* from Khor Abdullah (36). The genus *Stephanostomum* includes 117 accepted and six unaccepted species (78).

Family Lepocreadiidae

This family belongs to the superfamily Lepocreadioidea. It is represented in Basrah fishes with species belonging to genera *Lepidapedoides* and *Lepocreadioides*.

Lepidapedoides querni Yamaguti, 1970 was reported from *E. tauvina?* (*E. coioides*) from Khor Abdullah (17) as *Lepidapedon (Lepidapedoides) querni* Yamaguti, 1970. The authority of this species was reported in brackets by the researcher (17). *Lepidapedon (Lepidapedoides)* is a synonym of *Lepidapedoides* (51, 78). *L. querni* is enlisted within the 18 accepted species of the genus *Lepidapedoides* (78).

Lepocreadioides sp. 1 & 2 were reported from *Synaptura orientalis*, a synonym of *Brachirus orientalis* (46), from Khor Abdullah (36). The genus *Lepocreadioides* includes six accepted and three unaccepted species (78).

Family Heterophyidae

This family belongs to the superfamily Opisthorchioidea. It is represented in Basrah fishes with genera *Apophallus* and *Ascocotyle*.

Apophallus muehlingi (Jägerskiöld, 1899) Lühe, 1909 was reported, as metacercariae, from five fish species from Garmat Ali River (4). These fishes included *B. luteus* (= *C. luteus*), *H. fossilis*, *M. mastacembelus*, *M. pelusius* and *S. triostegus*. The adult worms of this parasite were reported from two gull species (*Larus canus* and *L. ichthyaetus*) from Shatt Al-Arab River (71) and from the gull *L. ridibundus* from Al-Baghdadi town, mid Iraq (7). *A. muehlingi* is enlisted within the 16 accepted species of the genus *Apophallus* (78). It is worth to mention here that the specific name *muehlingi* is written as *mühlingi* in some German literature.

Ascocotyle coleostoma (Looss, 1896) Looss, 1899 was reported as metacercariae from 22 fish species which included *A. marmid* from Garmat Ali River and Al-Salihiya canal (24), *A. latus* from Garmat Ali River (24), *A. mossulensis* from Garmat Ali River and Al-Salihiya canal (24), both *A. dispar* and *A. mento* from Garmat Ali River (54), *A. vorax* from Garmat Ali River (6, 4, 29, 24), *B. luteus* (= *C. luteus*) from Garmat Ali River (6, 4, 29), *C. auratus* from Garmat Ali River and Al-Salihiya canal (24), *C. carpio* from Garmat Ali River (6, 4, 29, 30), *G. holbrooki* from Garmat Ali River and Khora canal (54), *Hemiculter leucisculus* from Al-Salihiya canal (24), *H. fossilis* from Al-Hammar marsh (72, 34), Garmat Ali River (4, 24) and from Shatt Al-Arab River near Nahr Khoos village (20, 31, 32), *Ilisha compressa* from Garmat Ali River (24), *L. abu* from Garmat Ali River (52, 4, 24) and from Al-Salihiya canal (24), *L. subviridis* (= *C. subviridis*) from Garmat Ali River (52, 4, 24) and from Al-Salihiya canal (24), *M. mastacembelus* from Garmat Ali River (4, 5), *M. pelusius* from Garmat Ali River (4, 5), *P. latipinna* from Garmat Ali River (54), *S. triostegus* from Garmat Ali River (4, 5) and from Al-Hammar marsh (53, 1), *T. mystax*? (misapplied name for *T. whiteheadi*) from Garmat Ali River (24), *Hilsa ilisha*, a synonym of *Tenuvalosa ilisha* (46), from Garmat Ali River (24) and *Tilapia zillii* from Garmat Ali River (24). The first record of *A. coleostoma* in Iraq was from both *H. fossilis* and *L. abu* from Diyala River (22). So far, a total of 34 fish species were reported as hosts for *A. coleostoma* in Iraq (65). Adults of *A. coleostoma* infect some piscivorous birds such as the grey heron *Ardea cinerea* in Babylon fish farm, mid Iraq (66). *A. coleostoma* is enlisted within the nine species of the genus *Ascocotyle* (78).

Family Lissorchiidae

This family belongs to the superfamily Monorchioidea. It is represented in Basrah fishes with two valid species of the genus *Asymphyrodora* as well as unidentified species of the same genus.

Asymphyrodora kubanicum Issaichikoff, 1923 was reported only from *B. luteus* (= *C. luteus*) from Garmat Ali River (6, 29). The authority of this parasite was stated as (Isaichikov, 1923) in the former reference (6) and no authority was stated in the latter reference (29).

Asymphylogadora tincae (Modeer, 1790) Lühe, 1909 was reported from 10 fish species, all from Garmat Ali River (4). Dr. David I. Gibson (pers. comm.) stated the full authority as (Modeer, 1890) Braun, 1899 but most literature showed it as (Modeer, 1790). The infected fishes included *A. vorax*, *B. luteus* (= *C. luteus*), *Barbus sharpeyi* (= *M. sharpeyi*), *Carassius carassius*, *C. sellal* (= *A. sellal*), *C. carpio*, *H. fossilis*, *M. mastacembelus*, *M. pelusius* and *S. triostegus*. The first record of *A. tincae* in Iraq was from *Barbus subquincunciatus* (= *Luciobarbus subquincunciatus*) from Euphrates River (8).

Unidentified species of *Asymphylogadora* were reported from three fish species: *C. luteus* from Al-Hammar marsh (10) and its synonym *B. luteus* from Garmat Ali River (6), *M. sharpeyi* from Al-Hammar marsh (10) and *S. triostegus* from Al-Hammar marsh (53) as well as its synonym *P. triostegus* from Al-Hammar marsh (10). Species of *Asymphylogadora* infect freshwater fishes but only one species was reported from marine fishes (78). It is appropriate to mention here that *Asymphylogadora* is considered within the family Monorchidae in some sites (77, 78).

Family Monorchidae

This family belongs to the superfamily Monorchioidea. It is represented in Basrah fishes with only one species of the genus *Opisthomonorchis*.

Opisthomonorchis gibsoni (Ahmed, 1991) Madhavi, 2011 was recorded as *Retractomonorchis gibsoni* Ahmed, 1991 from *E. tauvina*? (*E. coioides*) from Khor Abdullah (17). *R. gibsoni* is considered as a synonym of *O. gibsoni* (40, 78). The genus *Opisthomonorchis* includes 21 accepted and seven unaccepted species (78).

Family Orientocreadiidae

This family belongs to the superfamily Plagiorchioidea. It is represented in Basrah fishes with two species of the genus *Orientocreadium*.

Orientocreadium batrachoides Tubanguy, 1931 was recorded only from *S. triostegus* from Al-Hammar marsh (53).

Orientocreadium pseudobagri Yamaguti, 1934 was recorded from nine fish species. These are *A. vorax* and *B. luteus* (= *C. luteus*) both from Garmat Ali River (4), *M. sharpeyi* from Al-Hammar marsh (10) as well as its synonym *B. sharpeyi* from Garmat Ali River (4, 27), *C. sellal* (= *A. sellal*), *Ctenopharyngodon idella*, *H. fossilis*, *M. mastacembelus* and *M. pelusius* all from Garmat Ali River (4) in addition to *S. triostegus* from Garmat Ali River (4) and from Al-Hammar marsh (53) as well its synonym *P. triostegus* from Al-Hammar marsh (10). The year of authority was erroneously given as 1954 instead of 1934 by one of the above references (10).

Family Faustulidae

This family belongs to the superfamily Microphalloidea. It is represented in Basrah fishes with two species of genera *Faustula* and *Paradiscogaster*.

Faustula rahemii Al-Daraji, 2004 was described as a new species from *Hilsa ilisha* (= *T. ilisha*) from Khor Al-Zubair lagoon (15). This species has uncertain taxonomic status as the author did not compare his description with the at least 10 other species infecting the same host in the world [Personal communication between A. H. Ali and Dr. Rodney A. Bray of the British Museum (Natural History), London, on 7th March 2012]. *F. rahemii* is not enlisted within the six accepted and two unaccepted marine species of *Faustula* (78). The search in the website failed to detect any information about this taxon.

Paradiscogaster farooqii Hafezaullah & Siddiqi, 1970 was recorded only from *A. latus* from Khor Abdullah (16). The genus *Paradiscogaster* includes 22 valid species and one species inquirenda (43).

Host-Parasite List

Names of all fish hosts infected with trematodes in Basrah province are alphabetically arranged. For each host, the trematode species are also alphabetically arranged. For each parasite species, the references are chronologically arranged but references of the same year are alphabetically arranged. The present host-trematode list included the valid as well as the synonymous names and the misidentified fishes.

Acanthobrama marmid: *Ascocotyle coleostoma* (24), *Clinostomum complanatum* (24) and *Diplostomum spathaceum* (24).

Acanthopagrus latus: *Ascocotyle coleostoma* (24), *Diplostomum spathaceum* (24), *Opistholebes* sp. (11) and *Paradiscogaster farooqii* (16).

Alburnus mossulensis: *Ascocotyle coleostoma* (24), *Clinostomum complanatum* (24) and *Diplostomum spathaceum* (24).

Alburnus sellal, reported as *Chalcalburnus sellal*: *Asymphyiodora tincae* (4), *Clinostomum complanatum* (4), *Diplostomum spathaceum* (4) and *Orientocreadium pseudobagri* (4).

Aphanius dispar: *Ascocotyle coleostoma* (54), *Clinostomum complanatum* (62), *C. phalacrocoracis* (54) and *Diplostomum* sp. (54).

Aphanius mento: *Ascocotyle coleostoma* (54), *Clinostomum phalacrocoracis* (54) and *Diplostomum* sp. (54).

Aspius vorax: *Ascocotyle coleostoma* (6, 4, 29, 24), *Aspidogaster enneatus* (10), *Asymphyiodora tincae* (4), *Clinostomum complanatum* (56, 62, 69, 4), *C. phalacrocoracis* (10), *Diplostomum spathaceum* (4, 24), *Diplostomum* sp. (6), *Hemiurus communis* (4), *Orientocreadium pseudobagri* (4) and strigeid metacercaria (6, 29).

Barbus luteus: See *Carasobarbus luteus*.

Barbus sharpeyi: See *Mesopotamichthys sharpeyi*.

Barbus xanthopterus: See *Luciobarbus xanthopterus*.

Brachirus orientalis, reported as *Synaptura orientalis*: *Lepocreadioides* sp. (36).

Carasobarbus luteus, reported as *B. luteus* by only four references (6, 4, 29, 24): *Allocreadium isoporum* (4), *Apophallus muehlingi* (4), *Ascocotyle coleostoma* (6,

- 4, 29), *Aspidogaster enneatus* (10), *Asymphylogaster kubanicum* (6, 29), *Asymphylogaster tincae* (4), *Asymphylogaster* sp. (10, 6), *Clinostomum complanatum* (56, 62, 69, 6, 4, 29), *C. phalacrocoracis* (10), *Diplostomum spathaceum* (4, 24), *Diplostomum* sp. (6), *Hemiurus communis* (4), *Orientocreadium pseudobagri* (4) and strigeid metacercaria (6, 29).
- Carassius auratus*: *Ascocotyle coleostoma* (24), *Clinostomum complanatum* (24) and *Diplostomum spathaceum* (24).
- Carassius carassius*: *Asymphylogaster tincae* (4).
- Chalcalburnus sellal*: See *Alburnus sellal*.
- Chelon macrolepis*, reported as *Liza macrolepis*: *Carassotrema lizae* (13), *Saturnius hadithi* (14), *S. segmentatus* (14) and *S. valamugilis* (14).
- Chelon subviridis*, reported as *L. subviridis*: *Ascocotyle coleostoma* (52; 4; 24), *Clinostomum complanatum* (52, 4), *Diplostomum spathaceum* (24), *Haplospilichthys mugilis* (38), *Lecithobotrys mhaiseni* (12), *Lecithochirium* sp. (11), *Saccocoelium tensum* (11), *Saturinus* sp. (11) and *Transversotrema haasi* (11).
- Chirocentrus nudus*: *Erilepturus gazzi*, which was reported as *Uterovesiculurus gazzi* (11) and *Erilepturus* sp., which was reported as *Uterovesiculurus* sp. (11).
- Ctenopharyngodon idella*: *Orientocreadium pseudobagri* (4).
- Cyprinus carpio*: *Ascocotyle coleostoma* (6, 4, 29, 30), *Asymphylogaster tincae* (4), *Clinostomum complanatum* (4, 26), *Diplostomum spathaceum* (24), *Diplostomum* sp. (6, 30) and strigeid metacercaria (6, 29).
- Eleutheronema tetradactylum*: *Erilepturus hamati* (21).
- Epinephelus coioides*, reported as *E. tauvina*: *Lepidapedoides querni*, reported as *Lepidapedon* (*Lepidapedoides*) *querni* (17), *Opisthomonorchis gibsoni*, reported as *Retractomonorchis gibsoni* (17), *Prosorhynchus epinepheli* (17) and *Tubolovesicula magnacetabulum* (17).
- Epinephelus tauvina*: See *Epinephelus coioides*.
- Gambusia affinis*: See *Gambusia holbrooki*.
- Gambusia holbrooki*, reported as *G. affinis* by one reference (62): *Ascocotyle coleostoma* (54), *Clinostomum complanatum* (62) and *Diplostomum* sp. (54).
- Hemiculter leuciscus*: *Ascocotyle coleostoma* (24).
- Hemiramphus marginatus*: *Schikhobalotrema indicum*, reported as *Chauhanotrema spiniacetabulum* (37) and *Treptodemus latus* (37).
- Heteropneustes fossilis*: *Allocreadium isoporum* (4), *Apophallus muehlingi* (4), *Ascocotyle coleostoma* (72, 34, 4, 20, 31, 32), *Asymphylogaster tincae* (4), *Clinostomum complanatum* (62, 72, 34, 4, 20), *C. dasi* (20), *Diplostomum spathaceum* (4), *Hemiurus communis* (4) and *Orientocreadium pseudobagri* (4).
- Hilsa ilisha*: See *Tenualosa ilisha*.
- Ilisha compressa*, reported also as *I. elongata* by one reference (11): *Ascocotyle coleostoma* (24) and *Ectenurus piscicola*, reported as *Clupenurus piscicola* (11).
- Ilisha elongata*: See *Ilisha compressa*.

- Johnius belangerii*, reported as *Johnius (Johnius) belangerii* by one reference (11):
Erilepturus sp., reported as *Uterovesiculurus* sp. (36), *Helicometrina* sp. (11),
Lecithochirium sp. (11) and *Pleorchis arabicus* (11).
- Johnius (Johnius) belangerii*: See *Johnius belangerii*.
- Johnius dussumieri*, reported as *Johnius (Johnieops) sina* by one reference (11):
Helicomertina karachiensis (11), *Helicometrina* sp. (11), *Lecithochirium* sp. (11)
and *Pleorchis arabicus* (11).
- Johnius (Johnieops) sina*: See *Johnius dussumieri*.
- Liza abu*: *Ascocotyle coleostoma* (52, 4, 24), *Clinostomum complanatum* (59, 52, 4, 26,
24), *C. phalacrocoracis* (10), *Diplostomum spathaceum* (4; 24) and strigeid
metacercaria (59, 19, 57, 60).
- Liza carinata*: *Saccocoelium tensum* (11).
- Liza macrolepis*: See *Chelon macrolepis*.
- Liza subviridis*: See *Chelon subviridis*.
- Luciobarbus xanthopterus*, reported as *Barbus xanthopterus*: *Diplostomum spathaceum*
(24).
- Mastacembelus mastacembelus*: *Allocreadium isoporum* (4), *Apophallus muehlingi* (4)
Ascocotyle coleostoma (4, 5), *Asymphylogora tincae* (4), *Clinostomum*
complanatum (4), *Diplostomum spathaceum* (4), *Hemiurus communis* (4) and
Orientocreadium pseudobagri (4).
- Mesopotamichthys sharpeyi*, reported as *B. sharpeyi* by two references (4, 27):
Aspidogaster enneatus (10), *Asymphylogora tincae* (4), *Asymphylogora* sp. (10)
and *Orientocreadium pseudobagri* (10, 4, 27).
- Mystus pelusius*: *Allocreadium isoporum* (4), *Apophallus muehlingi* (4), *Ascocotyle*
coleostoma (4, 5), *Asymphylogora tincae* (4), *Clinostomum complanatum* (4),
Diplostomum spathaceum (4), *Hemiurus communis* (4) and *Orientocreadium*
pseudobagri (4).
- Nematalosa nasus*: *Stephanostomum* sp. (11).
- Otolithes ruber*: *Erilepturus hamati* (21) and which was also reported as
Uterovesiculurus hamati (36), *Helicometrina karachiensis* (11), *H. otolithi* (11),
Lecithochirium sp. (36) and *Pleorchis arabicus* (11).
- Parasilurus triostegus*: See *Silurus triostegus*.
- Parastromateus niger*: *Lecithocladium bulbolabrum* (73).
- Poecilia latipinna*: *Ascocotyle coleostoma* (54), *Clinostomum complanatum* (24) and
Diplostomum sp. (55).
- Pseudorhombus arsius*: *Erilepturus hamati* (21).
- Saurida undosquamis*: *Hypohepaticola* sp. (36).
- Scomberoides commersonianus*: *Stephanostomum* sp. (36) and *Tergestia pauca* (36).
- Scomberomorus commerson*: See *Scomberomorus guttatus*.
- Scomberomorus guttatus*: *Bucephalus kaku* (11) and *Ectenurus* sp. (36).
- Silurus triostegus*: reported as *P. triostegus* by one reference (10): *Allocreadium*
isoporum (4), *Apophallus muehlingi* (4), *Ascocotyle coleostoma* (4, 5, 53, 1),
Aspidogaster enneatus (10), *Asymphylogora tincae* (4), *Asymphylogora* sp. (10,
53), *Clinostomum complanatum* (4, 53), *C. phalacrocoracis* (1), *Diplostomum*

spathaceum (4, 1, 24), *Hemiurus communis* (4), *H. sigani* (53), *Monodharmis torpedinis*, which was reported as *M. philippiensis* (53), *Orientocreadium batrachoides* (53), *Orientocreadium pseudobagri* (10, 4, 53) and *Proctoeces maculatus* (53).

Synaptura orientalis: See *Brachirus orientalis*.

Tenualosa ilisha, reported as *Hilsa ilisha* by one reference (15): *Ascocotyle coleostoma* (24) and *Faustula rahemii* (15).

Thryssa hamiltonii: *Erilepturus gazzi*, which was reported as *Uterovesiculurus gazzi* (11) and *Erilepturus* sp., which was reported as *Uterovesiculurus* sp. (11).

Thryssa mystax: See *Thryssa whiteheadi*.

Thryssa whiteheadi, reported as *T. mystax*: *Ascocotyle coleostoma* (24), *Erilepturus gazzi*, reported as *Uterovesiculurus gazzi* (11) and *Erilepturus* sp., which was reported as *Uterovesiculurus* sp. (11).

Tilapia zillii: *Ascocotyle coleostoma* (24).

Trichiurus lepturus: *Lecithochirium acutum* (21).

Finally, it is appropriate to mention here that the 54 trematode taxa so far recorded from fishes of Basrah province represent 69.2% of the total number of trematode taxa from freshwater and marine fishes of whole Iraq (65). Such high percentage is due to the presence of marine trematodes from fishes of Basrah province in addition to the freshwater trematodes.

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Table (1): List of trematodes of fishes of Basrah province^s.

Class Trematoda

Subclass Aspidogastrea

Family Aspidogastridae

Aspidogaster enneatus Eckmann, 1932 {4/4}*

Subclass Digenea

Family Bivesiculidae

Treptodemus latus Manter, 1961 {1/1}

Family Bucephalidae

Bucephalus kaku Yamaguti, 1970 {1/1}

Proisorhynchus epinepheli Yamaguti, 1939 {1/1}

Family Clinostomidae

Clinostomum complanatum (Rudolphi, 1814) Braun, 1899 {16/22}

Clinostomum dasi Bhalerao, 1942 {1/2}

Clinostomum phalacrocoracis Dubois, 1931 {6/9}

Family Diplostomidae

Diplostomum spathaceum (Rudolphi, 1819) Olsson, 1876 {15/31}

Diplostomum sp. {7/25}

Family Strigeidae

Strigeid metacercaria {4/4}

Family Fellodistomidae

Proctoeces maculatus (Looss, 1901) Odhner, 1911 {1/1}

Tergestia pauca Texeira de Freitas & Kohn, 1965 {1/1}

Family Tandanicolidae

Monodharmis torpedinis Dollfus, 1937 {1/1}

Family Hemiuridae

Ectenurus piscicola (Srivastava, 1935) {1/1}

Ectenurus sp. {1/1}

Erilepturus gazzi (Ahmed, 1980) Madhavi, 2011 {3/3}

Erilepturus hamati (Yamaguti, 1934) Manter, 1947 {3/3}

Erilepturus sp. {4/4}

Hemiurus communis Odhner, 1905 {6/6}

Hemiurus sigani Fischthal & Kuntz, 1964 {1/1}

Hypohepaticola sp. {1/1}

Lecithochirium acutum Chauhan, 1945 {1/1}

Lecithochirium sp. {4/4}

Lecithocladium bulbolabrum Reid, Coil & Kuntz, 1966 {1/1}

† *Saturnius hadithii* Al-Daraji, 2004a {1/1}

Saturnius segmentatus Manter, 1969 {1/1}

‡ *Saturnius valamugilis* Rekharani & Madhavi, 1985 {1/1}

Saturnius sp. {1/1}

Tubulovesicula magnacetabulum Yamaguti, 1939 {1/1}

Family Transversotrematidae

- Transversotrema haasi* Witenberg, 1944 {1/1}
- Family Haploporidae
- † *Carassotrema lizae* Al-Daraji, 1999 {1/1}
- † *Lecithobotrys mhaiseni* Al-Daraji, 1998 {1/1}
- Saccocoelium tensum* Looss, 1902 {2/2}
- Family Haplospilachnidae
- Haplospilachnus mugilis* Nahhas & Cable, 1964 {1/1}
- Schikhobalotrema indicum* (Zhukov, 1972) Overstreet & Curran, 2005 {1/1}
- Family Allocreadiidae
- Allocreadium isoporum* (Looss, 1894) Looss, 1900 {5/5}
- Family Opecoelidae
- Helicometrina karachiensis* Bilqees, 1977 {2/2}
- Helicometrina otolithi* Bilqees, 1972 {1/1}
- Helicometrina* sp. {2/2}
- Family Opistholebetidae
- Opistholebes* sp. {1/1}
- Family Acanthocolpidae
- Pleorchis arabicus* Al-Yamani & Nahhas, 1981 {3/3}
- Stephanostomum* sp. {2/2}
- Family Lepocreadiidae
- Lepidapedoides querni* Yamaguti, 1970 {1/1}
- Lepocreadioides* sp. {1/1}
- Family Heterophyidae
- Apophallus muehlingi* (Jägerskiöld, 1899) Lühe, 1909 {5/5}
- Ascocotyle coleostoma* (Looss, 1896) Looss, 1899 {22/34}
- Family Lissorchiidae
- Asymphylogora kubanicum* Issaïtschikoff, 1923 {1/1}
- Asymphylogora tincae* (Modeer, 1790) Lühe, 1909 {10/12}
- Asymphylogora* sp. {3/3}
- Family Monorchiidae
- Opisthomonorchoides gibsoni* (Ahmed, 1991) Madhavi, 2011 {1/1}
- Family Orientocreadiidae
- Orientocreadium batrachoides* Tubanguí, 1931 {1/1}
- Orientocreadium pseudobagri* Yamaguti, 1934 {9/10}
- Family Faustulidae
- † *Faustula rahemii* Al-Daraji, 2004b {1/1}
- Paradiscogaster farooqii* Hafezaullah & Siddiqi, 1970 {1/1}

§ Arranged according to the keys of Trematoda (47, 51, 40).

* Numbers in curly brackets after the authority of each parasite refer to number of hosts recorded for that parasite in Basrah province/ number of hosts recorded for the same parasite from the whole Iraq based on data obtained from the index-catalogue of parasites and disease agents of fishes of Iraq (65).

† Invalid species.

‡ *Species inquirenda*.

Table (2). List of fishes of Basrah province and their richness with the trematodes.

Order Clupeiformes

Family Chirocentridae

* *Chirocentrus nudus* Swainson, 1839 {2/2}

Family Clupeidae

* *Nematalosa nasus* (Bloch, 1795) {1/1}

** *Tenualosa ilisha* (Hamilton, 1822) {2/2}

Family Engraulidae

* *Thryssa hamiltonii* Gray, 1835 {2/2}

** *Thryssa whiteheadi* Wongratana, 1983 {3/3}

Family Pristigasteridae

** *Ilisha compressa* Randall, 1994 {2/2}

Order Cypriniformes

Family Cyprinidae

Acanthobrama marmid Heckel, 1843 {3/6}

Alburnus mossulensis Heckel, 1843 {3/4}

Alburnus sellal Heckel, 1843 {4/5}

Aspius vorax Heckel, 1843 {10/14}

Carasobarbus luteus (Heckel, 1843) {14/21}

Carassius auratus (Linnaeus, 1758) {3/5}

Carassius carassius (Linnaeus, 1758) {1/2}

Ctenopharyngodon idella (Valenciennes, 1844) {1/4}

Cyprinus carpio Linnaeus, 1758 {6/14}

Hemiculter leucisculus (Basilewsky, 1855) {1/1}

Luciobarbus xanthopterus Heckel, 1843 {1/5}

Mesopotamichthys sharpeyi (Günther, 1874) {4/8}

Order Siluriformes

Family Bagridae

Mystus pelusius (Solander, 1794) {8/10}

Family Heteropneustidae

Heteropneustes fossilis (Bloch, 1794) {9/11}

Family Siluridae

Silurus triostegus Heckel, 1843 {15/21}

Order Aulopiformes

Family Synodontidae

* *Saurida undosquamis* (Richardson, 1848) {1/1}

Order Beloniformes

Family Hemiramphidae

* *Hemiramphus marginatus* (Forsskål, 1775) {2/2}

Order Cyprinodontiformes

Family Cyprinodontidae

Aphanius dispar (Rüppell, 1829) {4/4}

Aphanius mento (Heckel, 1843) {3/3}

Family Poeciliidae

Gambusia holbrooki Girard, 1859 {3/3}

Poecilia latipinna (Lesueur, 1821) {3/3}

Order Perciformes

Family Carangidae

* *Parastromateus niger* (Bloch, 1795) {1/1}

* *Scomberoides commersonnianus* Lacepède, 1801 {2/2}

Family Cichlidae

Tilapia zillii (Gervais, 1848) {1/4}

Family Polynemidae

* *Eleutheronema tetradactylum* (Shaw, 1804) {1/1}

Family Sciaenidae

* *Johnius belangerii* (Cuvier, 1830) {4/4}

* *Johnius dussumieri* (Cuvier, 1830) {4/4}

* *Otolithes ruber* (Bloch & Schneider, 1801) {5/5}

Family Scombridae

* *Scomberomorus guttatus* (Bloch & Schneider, 1801) {2/2}

Family Serranidae

* *Epinephelus coioides* (Hamilton, 1822) {4/4}

Family Sparidae

** *Acanthopagrus latus* (Houttuyn, 1782) {4/4}

Family Trichiuridae

* *Trichiurus lepturus* Linnaeus, 1758 {1/1}

Order Synbranchiformes

Family Mastacembelidae

Mastacembelus mastacembelus (Banks & Solander, 1794) {8/12}

Order Mugiliformes

Family Mugilidae

* *Chelon macrolepis* (Smith, 1846) {4/4}

** *Chelon subviridis* (Valenciennes, 1836) {9/9}

Liza abu (Heckel, 1843) {5/5}

* *Liza carinata* (Valenciennes, 1836) {1/1}

Order Pleuronectiformes

Family Paralichthyidae

* *Pseudorhombus arsius* (Hamilton, 1822) {1/1}

Family Soleidae

* *Brachirus orientalis* (Bloch & Schneider, 1801) {1/1}

* Marine fishes, ** marine fishes entering freshwaters and the remaining fishes are freshwater fishes.

§ Richness of fishes with trematodes: number of trematode species recorded in any particular fish in Basrah province/ number of trematode species recorded from that fish from the whole waters of Iraq, based on the index-catalogue of parasites of fishes of Iraq (65).

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قوائم مرجعية لمخزّات أسماك المياه العذبة والبحرية في محافظة البصرة، العراق

فرحان ضمد محيسن¹، نجم رجب خميس² وأثير حسين علي²

1 بنابة 6B، 36 641 كاتريناهولم، السويد

2 قسم الأسماك والثروة البحرية، كلية الزراعة، جامعة البصرة، البصرة، العراق

e-mail: mhaisenft@yahoo.co.uk

الخلاصة. أظهر العرض المرجعي لمخزّات أسماك المياه العذبة والبحرية في محافظة البصرة، العراق وجود 54 نوعاً من هذه المخزّات. سجل 19 نوعاً من هذه المخزّات من أسماك مياه عذبة في حين سجلت بقية الأنواع من أسماك بحرية. كل هذه المخزّات تعود للصنف الثانوي ثنائية المنشأ بإستثناء النوع *Aspidogaster enneatus* الذي يعود للصنف الثانوي درعية البطن. هناك 32 نوعاً من هذه المخزّات بطور بالغ تعيش في معدة و/ أو أمعاء مضيفاتها بإستثناء النوع *Transversotrema haasi* الذي ظهر على الجلد في حين ظهرت ثمانية أنواع بشكل طور يرقة الميتاسركاريا المتكيسة في جلد أو غلاصم أو عيون الأسماك. تذبذب عدد أنواع المخزّات لكل نوع من أنواع الأسماك مابين نوع واحد من الطفيليات في 13 مضيّفاً إلى 15 نوعاً في الجري الآسيوي فقط. تذبذب عدد أنواع الأسماك المضيّفة لتلك المخزّات من مضيّف واحد في حالة الإصابة بـ 32 نوعاً من هذه الطفيليات إلى 22 مضيّفاً في حالة المخزّم *Ascocotyle coleostoma*.