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Updating checklist of freshwater fishes of Iraq

Abbas J. Al-Faisal

Affiliation: Marine Science Centre, University of Basrah, Basrah, Iraq

Corresponding Author : abbasjsm71@yahoo.com

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Abstract

The present study provides an updated checklist of the freshwater fishes of Iraq. The confirmed freshwater fishes of Iraq comprise 66 species divided among 18 families and eight orders. The most successful fish families are Cyprinidae with 25 species, followed by Leuciscidae with eight species then Nemacheilidae with seven species. A total of 16 exotic species in seven families are listed in this study. Changes made to the scientific names of the freshwater fishes of Iraq are explained, which included 16 species in six genera.

Key words: checklist, freshwater fishes, Iraq.

Introduction

Iraq is one of the hottest countries in the world and is semi-arid overall. It is located in the Eastern Mediterranean Region, border by South Anatolia in the north, Iran in the east and northeast, Syria and Jordan in the west, it opens on the Saudi Arabia, Kuwait and the Gulf in the south [1]. The Euphrates–Tigris rivers basin is a transboundary basin with a total area of 879 790 km² distributed between Iraq (46 percent), Turkey (22 percent), Iran (19 percent), Syria (11 percent), Saudi Arabia (1.9 percent) and Jordan (0.03 percent). Most of the Euphrates–Tigris basin has a sub-tropical Mediterranean climate with wet winters and dry summers [2]. The lowlands of Iraq, known as Mesopotamia, the land between the rivers, have extensive marsh and lake habitats comprise marshes, natural lakes, dams, and rivers. The Tigris and Euphrates meander across the plain and end up partly as an inland delta. Spring snowmelt causes extensive flooding on the plains and is critical to the ecology of the marshlands centered on the confluence of the Tigris and Euphrates rivers in southern Iraq [3].

The early work of Johann Jakob Heckel (1790-1857) is one of the most important studies on the Middle East and specifically on Iraq. He described the collections sent by Theodor Kotschy from Syria, which includes such places as Damascus, the Quwayq and Orontes rivers near Aleppo in Syria and Antakya, the Jordan River, Mosul on the Tigris River and Kurdistan. Latter studies increased our knowledge about the biodiversity of Iraqi freshwater fishes, include those by Cuvier (1769-1832), Valenciennes (1794-1865), Günther (1830-1914), Sauvage (1844-?) Pietschmann (1881-1956), Berg (1876-1950) [3].

Appearance of works written by Iraqi naturalists were on the 1960s. Khalaf [4] and Mahdi [5] produced the first guides to the marine and freshwater fishes of Iraq [6]. After that, many studies have been carried out [7 ; 8 ; 9 ; 10 ; 11 ; 12 ; 13 ; 14 ; 15 ; 16 ; 17 ; 18 ; 19 ; 20 ; 3 ; 21]. The aim of the study is to provide an updated checklist of freshwater fishes of Iraq, including endemic and exotic fishes, in addition to changes made to the scientific names.

Material and Methods

The present checklist is based on information collected from the previous studies of Iraqi freshwater fishes [4 ;5 ; 8 ;9 ; 14 ;16 ;19 ;20 ; 21]. Recently, Coad's [3] book of freshwater fishes of Iraq served as the most authoritative source for fish identification for Iraqi freshwater. Since then many species have been recorded in other studies.

Results and Discussion

Table (1) showed changes made to the scientific names of Iraqi freshwater fishes, which included 16 species belong to six genera. The family Cyprinidae was recently divided into four family level groupings in Iraq: Cyprinidae, Danionidae, Xenocyprididae and Leuciscidae. For *Alburnus mossulensis* Heckel, 1843, it seems not certain whether it is a synonym of *Alburnus sellal* Heckel, 1843, due to the differences in some morphological characters (*A. mossulensis* more slender and elongate, the pelvic, dorsal and anal fins are more anterior so the caudal peduncle is more elongate, the eyes are larger and lower on the head, and there is a lead-coloured stripe separating the upper third of the body from the lower part) and the difficulty of obtaining fresh material of *A. sellal* in its polluted habitat at Aleppo in Syria [22].

A total of 13 species has added to list of freshwater fishes of Iraq since 2009, *Coptodon zillii*, *Oreochromis aureus*, *Pangasianodon hypophthalmus*, *Oreochromis niloticus*, *Glyptothorax* sp., *Eidinemacheilus proudlovei*, *Oxynoemacheilus zarzianus*, *Oxynoemacheilus gyndes*, *Oxynoemacheilus hanae*, *Carasobarbus sublimus*, *Atractosteus spatula*, *Salmo caspius* and *Oncorhynchus mykiss* according to [23], [24],[25],[26], [27],[28], [29],[30],[31], [32]and [33] respectively.

The list of the freshwater fishes of Iraq included 66 species belong to 18 families and eight orders (Table 2). The family Cyprinidae dominated the ichthyofauna of the Iraqi freshwater, which is represented by 25 species, followed by Leuciscidae with eight species then Nemacheilidae with seven species. Nine families are represented by a single species. There are 16 exotic species in seven families, introduced from another country (*Atractosteus spatula*, *Carassius gibelio*, *Ctenopharyngodon idella*, *Cyprinus carpio*, *Hemiculter leucisculus*, *Hypophthalmichthys molitrix*, *Hypophthalmichthys nobilis*, *Heteropneustes fossilis*, *Pangasianodon hypophthalmus*, *Oncorhynchus mykiss*, *Salmo caspius*, *Gambusia holbrooki*, *Poecilia latipinna*, *Coptodon zillii*, *Oreochromis aureus* and *Oreochromis niloticus*).

The previous studies have differed in the number of freshwater fish species recorded in the Iraqi waters [21]. Khalaf [4] described 44 species belonging to eight families, Mahdi and Georg [8] reported 69 species belonging to 10 families, Al-Dham [16] reported 70 species within 10 families, Banister [14] explained the existence of 66 species in the Tigris and Euphrates basin belonging to nine families, Coad [19] indicated that the Tigris and Euphrates basin comprised 66 species belonging to 12 families, Coad [20] reported 52 species belonging to seven families in the Tigris and Euphrates basin, while Coad [3] recorded 53 freshwater species in Iraq belong to 11 families. The difference in the number of species in previous studies may be due to the fact that some species have been recorded with synonyms and are originally of the same species [14], and some species may have been recorded by mistake, Coad [19] considered 23 species as rejected records in The Euphrates–Tigris basin (*Acanthobramacentisquama*, *Acanthobrama tricolor*, *Alburnus orontis*, *Barbus canis*, *Barbus chantrei*, *Barbus cyclolepis*, *Barbus longiceps*, *Barbus lorteti*, *Capoeta pestai*, *Chalcalburnus chalcoides*, *Chalcalburnus sellal*, *Chalcalburnus tarichi*, *Chondrostoma nasus*, *Cyprinion tenuiradius*, *Garra lamta*, *Hemigrammocapoeta nana*, *Leuciscus spurius*, *Phoxinellus zeregi*, *Xenocypris macrolepidotus*, *Cobitis aurata*, *Cobitis elongata*, *Nemacheilus insignis* and *Nemacheilus panther*).

Table 1. Changes to the Scientific names of Iraqi freshwater fishes.

Former name	New name	Reference
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<i>Aspius vorax</i>	<i>Leuciscus vorax</i>	[34]
<i>Barbus grypus</i>	<i>Arabibarbus grypus</i>	[35]
<i>Barbus kosswigi</i>	<i>Carasobarbus kosswigi</i>	[36], [37]
<i>Barbus luteus</i>	<i>Carasobarbus luteus</i>	
<i>Barbus sublimus</i>	<i>Carasobarbus sublimus</i>	
<i>Barbus barbulus</i>	<i>Luciobarbus barbulus</i>	[36], [38], [39]
<i>Barbus esocinus</i>	<i>Luciobarbus esocinus</i>	
<i>Barbus kersin</i>	<i>Luciobarbus kersin</i>	
<i>Barbus pectoralis</i>	<i>Luciobarbus pectoralis</i>	
<i>Barbus subquincunciatus</i>	<i>Luciobarbus subquincunciatus</i>	
<i>Barbus xanthopterus</i>	<i>Luciobarbus xanthopterus</i>	
<i>Barbus sharpeyi</i>	<i>Mesopotamichthys sharpeyi</i>	[36], [40]
<i>Hemigrammocapoeta elegans</i>	<i>Garra elegans</i>	[41]
<i>Typhlogarra widdowsoni</i>	<i>Garra widdowsoni</i>	[42]
<i>Liza abu</i>	<i>Planiliza abu</i>	[43]
<i>Tilapia zillii</i>	<i>Coptodon zillii</i>	[44]

Table 2. List of freshwater fish species in Iraq, (*: exotic species).

Order	Family	Species
Lepisosteiformes	Lepisosteidae	* <i>Atractosteus spatula</i> (Lacepède, 1803)
Cypriniformes	Cobitidae	<i>Cobitis taenia</i> Linnaeus, 1758
	Nemacheilidae	<i>Eidinemacheilus proudlovei</i> Freyhof, Abdullah, Ararat, Ibrahim & Geiger, 2016
		<i>Oxynoemacheilus argyrogramma</i> (Heckel, 1849)
		<i>Oxynoemacheilus frenatus</i> (Heckel, 1843)
		<i>Oxynoemacheilus gyndes</i> Freyhof & Abdullah, 2017
		<i>Oxynoemacheilus hanae</i> Freyhof & Abdullah, 2017
		<i>Oxynoemacheilus zarzianus</i> Freyhof & Geiger, 2017
		<i>Paracobitis malapterura</i> (Valenciennes in Cuvier and Valenciennes, 1846)
	Cyprinidae	<i>Arabibarbus grypus</i> (Heckel, 1843)
		<i>Barbus lacerta</i> Heckel, 1843
		<i>Caecocypris basimi</i> Banister and Bunni, 1980
		<i>Capoeta aculeata</i> (Valenciennes in Cuvier and Valenciennes, 1844)
		<i>Capoeta barroisi</i> (Lortet in Barrois, 1894)
		<i>Capoeta damascina</i> (Valenciennes in Cuvier and Valenciennes, 1842)
		<i>Capoeta trutta</i> (Heckel, 1843)
		<i>Carasobarbus kosswigi</i> (Ladiges, 1960)
		<i>Carasobarbus luteus</i> (Heckel, 1843)
		<i>Carasobarbus sublimus</i> (Coad & Najafpour, 1997)
		* <i>Carassius gibelio</i> (Bloch, 1782)
		<i>Cyprinion kais</i> Heckel, 1843
		<i>Cyprinion macrostomum</i> Heckel, 1843
		* <i>Cyprinus carpio</i> Linnaeus, 1758
		<i>Garra elegans</i> (Günther, 1868)
		<i>Garra rufa</i> (Heckel, 1843)
		<i>Garra variabilis</i> (Heckel, 1843)
		<i>Garra widdowsoni</i> (Trewavas, 1955)
		<i>Luciobarbus barbulus</i> (Heckel, 1849)
		<i>Luciobarbus esocinus</i> Heckel, 1843
		<i>Luciobarbus kersin</i> (Heckel, 1843)
		<i>Luciobarbus pectoralis</i> (Heckel, 1843)

		<i>Luciobarbus subquincunciatus</i> (Günther, 1868)
		<i>Luciobarbus xanthopterus</i> Heckel, 1843
		<i>Mesopotamichthys sharpeyi</i> (Günther, 1874)
	Danionidae	<i>Barilius mesopotamicus</i> Berg, 1932
	Xenocyprididae	* <i>Tenopharyngodon idella</i> (Valenciennes in Cuvier and Valenciennes, 1844)
		* <i>Hemiculter leucisculus</i> (Basilewsky, 1855)
		* <i>Hypophthalmichthys molitrix</i> (Valenciennes in Cuvier and Valenciennes, 1844)
		* <i>Hypophthalmichthys nobilis</i> (Richardson, 1844)
	Leuciscidae	<i>Acanthobrama marmid</i> Heckel, 1843
		<i>Alburnoides bipunctatus</i> (Bloch, 1782)
		<i>Alburnus caeruleus</i> Heckel, 1843
		<i>Alburnus mossulensis</i> Heckel, 1843
		<i>Chondrostoma regium</i> (Heckel, 1843)
		<i>Leuciscus vorax</i> (Heckel, 1843)
		<i>Squalius cephalus</i> (Linnaeus, 1758)
		<i>Squalius lepidus</i> Heckel, 1843
Siluriformes	Sisoridae	<i>Glyptothorax kurdistanicus</i> (Berg, 1931)
		<i>Glyptothorax steindachneri</i> (Pietschmann, 1913)
		<i>Glyptothorax</i> sp.
	Siluridae	<i>Silurus triostegus</i> Heckel, 1843
	Heteropneustidae	* <i>Heteropneustes fossilis</i> (Bloch, 1794)
	Pangasiidae	* <i>Pangasianodon hypophthalmus</i> (Sauvage, 1878)
	Bagridae	<i>Mystus pelusius</i> (Solander in Russell, 1794)
Salmoniformes	Salmonidae	* <i>Oncorhynchus mykiss</i> (Walbaum, 1792)
		* <i>Salmo caspius</i> Kessler, 1877
Mugiliformes	Mugilidae	<i>Planiliza abu</i> (Heckel, 1843)
Cyprinodontiformes	Cyprinodontidae	<i>Aphanius dispar</i> (Rüppell, 1829)
		<i>Aphanius mento</i> (Heckel, 1843)
		<i>Aphanius mesopotamicus</i> Coad, 2009
	Poeciliidae	* <i>Gambusia holbrooki</i> Girard, 1859
		* <i>Poecilia latipinna</i> (Lesueur, 1821)
Synbranchiformes	Mastacembelidae	<i>Mastacembelus mastacembelus</i> (Banks and Solander in Russell, 1794)
Perciformes	Cichlidae	* <i>Coptodon zillii</i> (Gervais 1848)
		* <i>Oreochromis aureus</i> (Steindachner, 1864)
		* <i>Oreochromis niloticus</i> (Linnaeus, 1758)

Conclusions

The freshwater ichthyofauna of Iraq still not completed. Changes have occurred in the list of freshwater fishes of Iraq during the last decade, including the number of species and updating some scientific names. Therefore, this checklist may provide policy for continuing studies of the freshwater ichthyofauna of Iraq.

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