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abdulalwan@yahoo.com
.marshbulletin@yahoo.com

# Exotic freshwater fishes in the southern Iraq

Abbas J. Al-Faisal, Falah M. Mutlak, Sagad. A. Abdullah

*Dept. of Aquaculture and Marine Fisheries, Marine Science Center,*

*University of Basrah*

E-mail: abbasjssm@yahoo.com, falahmutlak@yahoo.com

## Abstract

*Exotic fish species in the southern Iraq were reviewed. A total of 12 species have been reported belong to five families: Cichlidae, Cyprinidae, Heteropneustidae, Pangasiidae and Poeciliidae. Exotic species of fishes were introduced to Iraq for improving local fishery potential and for broadening species diversity in aquaculture programmes [Ctenopharyngodon idella (Valenciennes in Cuvier and Valenciennes, 1844), Cyprinus carpio Linnaeus, 1758, Hypophthalmichthys molitrix (Valenciennes in Cuvier and Valenciennes, 1844) and Hypophthalmichthys nobilis (Richardson, 1844)] or for controlling of unwanted organisms [Gambusia holbrooki Girard, 1859 and Heteropneustes fossilis (Bloch, 1794)], or introduced accidentally, also exotic fish introduced in the neighbouring countries may find their way to inland water of Iraq [Carassius gibelio (Bloch, 1782), Hemiculter leucisculus (Basilewsky, 1855), Poecilia latipinna (Lesueur, 1821), Oreochromis aureus (Steindacher, 1864) and Tilapia zillii (Gervais, 1848)], or for aquarium escape [Pangasianodon hypophthalmus (Sauvage, 1878)].*

**Introduction:**

The aquatic biodiversity of the world is changing and getting depleted alarmingly fast as a result of extinctions caused by habitat loss, pollution, introduction of exotic species, over exploitation and other anthropogenic activities (Moyle and Moyle, 1995). Fishes are the keystone species which determine the distribution and abundance of other organisms in the ecosystem they represent and are good indicators of the water quality and the health of the ecosystem, nearly 20 per cent of the world's freshwater fish fauna is already extinct or is on the verge of extinction (Moyle and Leidy, 1992). Exotic species of fishes were introduced in many parts of the world for: (a) improving local fishery potential and for broadening species diversity in aquaculture programmes, (b) sport fishing, (c) for aquarium keeping, (d) controlling of unwanted organisms. Furthermore, there are accidental and or unauthorized introductions, also, exotic organisms introduced in one country may find their way to the neighbouring countries (Kumar, 2000).

Some exotic freshwater fish species in Iraqi inland waters reported in previous studies (Khalaf, 1961; Mahdi and George, 1969; Al-Nasiri and Hoda, 1975; Al-Daham, 1977; Coad, 1996; Coad and Hussain, 2007; Al-Sa'adi, 2007; Ali, 2008; Al-Faisal, 2008; Mutlak and Al-Faisal, 2009; Al-Faisal, 2010; Coad, 2010; Al-Sa'adi *et al*., 2012; Al-Faisal and Mutlak, 2012; Jawad *et al*., 2012; Khamees *et al*., 2013).

**Material and Methods:**

A total of 500 fish specimen from different stations of southern Iraq (Hammar, Chybayish and Huwazeh marshes, Shatt Al-Arab river, Qarmat Ali river and the main outfall drain) were sampled from July 2012 to November 2013. Sampling was by seine net, fixed gill net and electro-fishes gear. Also we surveyed the literatures about exotic freshwater fish species of southern Iraq (Al-Faisal, 2008; Ali, 2008; Mutlak and Al-Faisal, 2009; Al-Faisal and Mutlak, 2012; Jawad *et al*., 2012; Khamees *et al*., 2013).

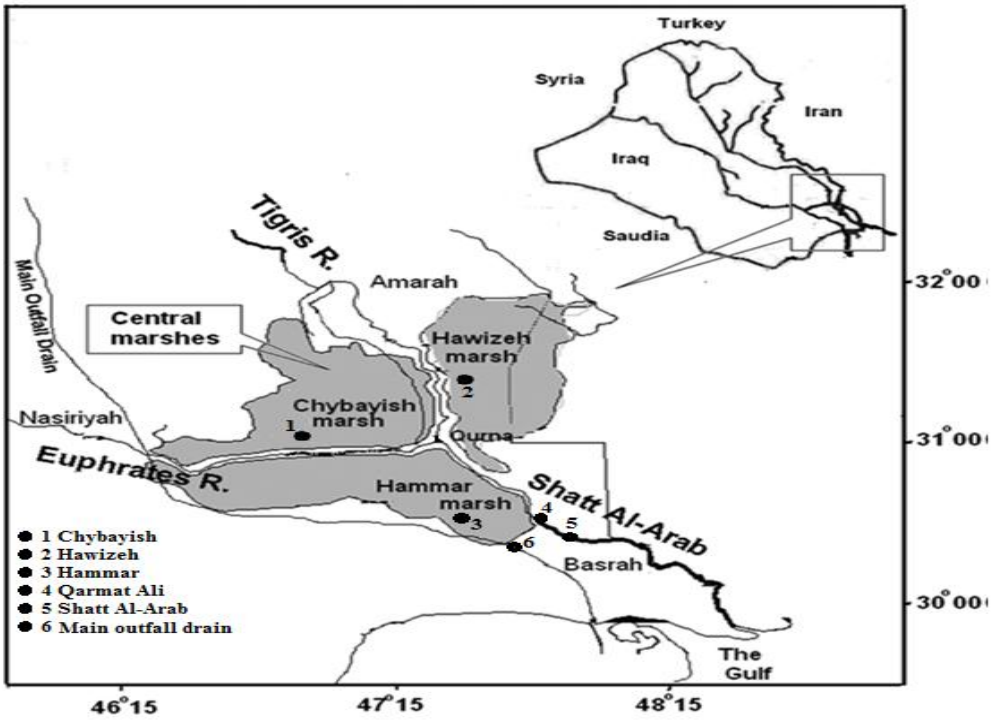


Fig. (1): Map of southern of Iraq, showing the sampling sites

**Results and Discussion:**

A total of 12 exotic fish species in south of Iraq have been reported, belong to following taxonomic section:

Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae
*Carassius gibelio* (Bloch, 1782)
*Ctenopharyngodon idella* (Valenciennes in Cuvier & Valenciennes, 1844)
*Cyprinus carpio* Linnaeus, 1758
*Hemiculter leucisculus* (Basilewsky, 1855)
*Hypophthalmichthys molitrix* (Valenciennes in Cuvier & Valenciennes, 1844)
*Hypophthalmichthys nobilis* (Richardson, 1844)

Order: Cypriniodontiformes
Family: Poeciliidae
*Gambusia holbrooki* Girard, 1859
*Poecilia latipinna* (Lesueur, 1821)

Order: Perciformes
Family: Cichlidae
*Oreochromis aureus* (Steindacher, 1864)
*Tilapia zillii* (Gervais, 1848)

Order: Siluriformes
Family: Heteropneustidae
*Heteropneustes fossilis* (Bloch, 1794)
Family: Pangasiidae

*Pangasianodon hypophthalmus* (Sauvage, 1878), see Khamees *et al*., (2013)

### ***Carassius gibelio* (Bloch, 1782)**

The gibel carp is reported for farm ponds in Iraq belong scientific name *Carassius auratus* or *Carassius carassius* (Ali, 1985). Jawad *et al*., (2012) reported *C. gibelio* from Basrah Province of southern Iraq, distinguishing it from *C. auratus* and *C. carassius*. This species appeared on the Basrah fish market when an increase in the Tigris river discharge reduced the salinity of the Shatt al-Arab river (Coad, 1996). The combination of spines in both the dorsal and anal fins and the absence of barbels is unique to this species.

The first records of the species *C. gibelio* were given as *C. auratus* by Baran and Ongan (1988) and *C. auratus gibelio* by Ozulug (1999) from Lake Gala and Byukekmece Dam Lake, respectively, from the Thrace region of Turkey (Sasi and Balik, 2003).

Fig. (1): *Carassius gibelio*

***Ctenopharyngodon idella* (Valenciennes in Cuvier & Valenciennes, 1844)**

Grass carp was introduced to Khuzestan Province, Iran in the 1970 to control vegetation in irrigation ditches and to Iraq fish farms (Shireman and Smith, 1983; Ali *et al*., 1988). Large numbers of fingerlings are produced by hatcheries in Iraq for restocking in irrigation and drainage ditches (White,1988). This species is identified by the eyes being lower side of the head, the anal fin is far back on the body close to the caudal fin, and pharyngeal teeth have large, parallel grooves on the grinding surface.

***Cyprinus carpio* Linnaeus, 1758**

The common carp is fish-farmed and widely transplanted the Tigris-Euphrates basin, Pond culture of carp was started in Iraq in 1955 and lakes, reservoirs and irrigation channels were subsequently stocked with fingerlings (Ahmed and Taher, 1988). This species rapidly became established in Iraq. This species is easily identified by the long dorsal fin, the spine in both the dorsal and anal fins, and the two pairs of barbels.

Fig. (2): *Ctenopharyngodon idella*

Fig. (3): *Cyprinus carpio*

***Hemiculter leucisculus* (Basilewsky, 1855)**

The native range of this species is from Maritime Russia south through China to Korea and Viet Nam, This species is introduced to Iran, probably by accident along with commercial shipments of Chinese major carps from central Asia in the former U.S.S.R. and/or Rumania in 1967 . It recorded from the Hawizah marsh (Coad and Hussain, 2007), and in southern Iraq marshes (Al-Faisal, 2008).This species distinguish by the sharp keel, , extending from the vent or anus to the throat below the pectoral fin on the mid-ventral surface is distinctive, especially when combined with the dorsal fin spine and the three rows of pharyngeal teeth.

Fig. (4): *Hemiculter leucisculus*

***Hypophthalmichthys molitrix* (Valenciennes in Cuvier & Valenciennes, 1844)**

The silver carp, one of the Chinese major carps, was introduced to reservoirs and marshes throughout Iran including in Khuzestan Province and in Zaribar lake, Kordestan by release from private and government fish farms, and is used in a variety of fish farms in Iraq (Ali *et al*., 1988). The abdomen of this species has a compressed keel extending from the breast to the vent, the eyes are positioned low such that they are visible from the underside of the head, and scales are minute. The similar bighead (*H. nobilis*) can be distinguished by the long pectoral fins which extend past the origin of the pelvic fins, a shorter keel (pelvic fins to anus), and gill raker structure. The

gill rakers form a very fine, sponge-like mesh used to filter small planktonic food. This species is a pump filter feeder, taking smaller particles than bighead carp (Coad, 2010).

***Hypophthalmichthys nobilis* (Richardson, 1844)**

The Bighead, one of the Chinese major carps, is reported from fish farms and reservoirs in Khuzestan, Iran, this species has been advocated for introduction to Syrian reservoirs (Coad, 1996). It is used in fish farms in Iraq. It is an important commercial species for farm ponds, feeding on phytoplankton when adult.

Fig. (5): *Hypophthalmichthys molitrix*

Fig. (6): *Hypophthalmichthys nobilis*

***Gambusia holbrooki* Girard, 1859**

The Mosquitofish has been introduced throughout the basin in Iran, Iraq, Turkey and Syria. It introduced to control larval mosquitos and reduce the incidence of malaria (Coad, 1996). The Mosquitofish is now the most widely distributed fish in the Tigris-Euphrates basin. Males are easily recognized by the anal fin rays 3-5 being specially modified into an elongate gonopodium for intromittent fertilization. *Gambusia halbrooki* and *G. affinis* are considered together because these two fish species are very closely related, similar in appearance, similar in biology and often confused (Pyke, 2005), *G. holbrooki* has 8 dorsal and 11 anal total fin rays while *G. affinis* has 7 dorsal and 10 anal total fin rays (Walters and Freeman, 2000).


Fig. (7): *Gambusia holbrooki*

***Poecilia latipinna* (Lesueur, 1821)**

The sailfin molly is native to the coastal waters of the Gulf of Mexico and the Atlantic Ocean, from southeast North Carolina to the Yucatan, including estuaries and freshwater tributaries. Individuals have been found in shallow marsh areas, and large populations inhabit areas were water flow has been altered . Because of its wide environmental tolerances

and popularity as an aquarium fish, *P. latipinna* has been introduced throughout the world (Felly and Daniels, 1992). This fish are further characterized by: a single, spineless dorsal fin; a squared off or rounded caudal fin; and an anal fin in males modified into a copulatory organ, called a gonopodium.

Fig. (8): *Poecilia latipinna* (male)

***Oreochromis aureus*** **(Steindacher, 1864)**

The Blue tilapia is captured of a specimen from the Khabour river in Syria, presumably an escape from a fish farm in the basin of this tributary of Euphrates river (Coad, 1996). It recoreded in Iraq by Mutlak and Al-Faisal (2009) at the main outfall drain in Basrah city. Blue tilapia have 18-26 gill rakers on the lower part of their first gill arch. They have 15 dorsal spines and 3 anal spines. The caudal fin has a broad pink to bright red distal margin. Breeding males have intense bright metallic blue on their head, a vermilion coloration on the edge on their dorsal fin and an intense pink coloration on the margin of their caudal fin.

Fig. (9): *Oreochromis aureus*

***Tilapia zillii* (Gervais, 1848)**

The Redbelly tilapias is established in the Syrian Euphrates, and recored at Al Musayyib on the Euphrates river in Iraq (Al-Sa'adi, 2007 ; Al-Sa'adi *et al*., 2012), and recorded at the main outfall drain in Basrah city (Mutlak and Al-Faisal, 2009). Coloration of *T. zillii* is dark olive on top and light olive to yellow-brown on the sides, often with an iridescent blue sheen. Lips are bright green and the chest is pinkish, six to seven dark vertical bars cross two horizontal stripes on the body and caudal peduncle. Redbelly tilapia has 8-11 gill rakers on the lower part of their its gill arch. They have 15-16 dorsal spines and 3 anal spines. Tilapias are among the most resistant fishes known against to diseases and relatively bad environmental conditions such as high stocking density of fish, lower water quality, organically pollutant water, and low dissolved oxygen level of the water (Altun *et al*., 2006).

Fig. (10): *Tilapia zillii*

***Heteropneustes fossilis* (Bloch, 1794)**

This catfish has been introduced to the Tigris river basin in southern Iraq (Zakaria,1964). It was widely distributed in all the rivers and marshes of southern Mesopotamia. This species was introduced to Iraq for eat the snail *Bulinus truncatus*, avector for the human parasite causing schistosomiasis. It has 4 pairs of barbels, short and spineless dorsal fin, absence of an adipose fin, and the long anal fin are distinctive. The head is small and very flattened and tapers both dorsally and ventrally to a terminal mouth.

Fig. (11): *Heteropneustes fossilis*

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## أنواع أسماك المياه العذبة الدخيلة في مسطحات جنوب العراق

عباس جاسم الفيصل وفلاح معروف مطلك وسجاد عبد الغني عبدالله
قسم الاستزراع المائي والمصائد البحرية، مركز علوم البحار، جامعة البصرة

**المستخلص**

سُجِلَ 12 نوعاً من الأسماك الدخيلة في مسطحات جنوب العراق، تعود إلى خمس عوائل (عائلة الشبوطيات Cyprinidae والبلطي Cichlidae والكمبوزيا Poeciliidae والجري اللاسع Heteropneustidae وعائلة Pangasiidae). دخلت هذه الأنواع الغريبة البيئة المحلية إما للنشاطات البشرية مثل عمليات التربية والاستزراع فيما يخص أنواع اسماك الكارب الشائع *Cyprinus carpio* والكارب العشبي *Ctenopharyngodon idella* والكارب الفضي *Hypophthalmichthys molitrix* والكارب كبير الرأس *Hypophthalmichthys nobilis*، أو لغرض مكافحة بعض الأمراض مثل إدخال اسماك الكمبوزيا *Gambusia holbrooki* للتخلص من يرقات البعوض ومنع انتشار مرض الملاريا، وإدخال اسماك أبو الحكم (الجري اللاسع) *Heteropneustes fossilis* للتخلص من بعض القواقع وبالتالي مكافحة مرض البلهارزيا. أو دخول أنواع أخرى لأسباب عرضية نتيجة للمياه المُشتركة مع دول الجوار أو كأسماك زينة وهذا يشمل الأنواع التالية: اسماك الكرسين *Carassius gibelio* والنوع *Hemiculter leucisculus* والمولي *Poecilia latipinna* ونوعين من اسماك عائلة البلطي *Oreochromis aureus* و *Tilapia zillii* و *Pangasianodon hypophthalmus*.