First Record of Striped Catfish *Pangasianodon hypophthalmus* (Sauvage, 1878) (Pisces: Pangasiidae) from Inland Waters of Iraq

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Abstract. Two specimens of catfish were recorded for the first time from two different natural waters in Iraq. The first specimen was 67.7 mm. in total length, collected during a study on fish parasites of Ibn Najim marsh in the middle of Iraq during 2009. The second specimen was 312 mm in total length, captured during a survey on fishes of Shatt Al-Basrah canal south of Iraq in 2011. Twelve local aquarium pangasiids (Imported from the Philippines) were examined for morphometric and meristic characteristics for comparison. The results indicated that the aquarium specimens are closely allied to the wild specimens, all were identical with the genus *Pangasianodon*. The studied fish had characters share with *P. hypophthalmus* (Sauvage, 1878). The new occurrence of the striped catfish in Iraq, might be due to aquarium escape.

Key words: *Pangasianodon hypophthalmus*, alien fish, Pangasiidae, inland waters, Aquarium, Iraq.

Introduction

The inland water of Iraq includes mainly the Tigris river, Euphrates river and Shatt Al-Arab river. Many tributaries, lakes, reservoirs and marshes are also present. Historically, this environment was the niche of highly important unique commercial freshwater fishes. The majority of fish species of inland water of Iraq are belong to the order Cypriniformes (13). Comparing lists from the 1960s and 1970s with that of the 1980s, it is clear that the number of fish species has dropped dramatically, as they were replaced by introduced and alien species such as *Cyprinus carpio*, *Carassius auratus*, *Ctenopharyngodon idella*, *Hypophthalmichthys molitrix*, *Gambusia halbrooki*, *Heteropneustes fossilis* (3;4), *Tilapia zillii* (1; 2), *Oreochromis aureus* (14), *Hemiculter leucisculus* (5) and *Poecilia latipinna* (4). Such major replacements in the species composition are mainly due to significant changes in the environment e.g. ditch, dike, and drain the marshes of southern Iraq (22) and due to industrial and sewage pollutions, in addition to harmful agricultural activities. Recently many native cyprinids in Iraq are reported as red list.

During a study on fish parasites of Ibn Najim Marsh, in the middle of Iraq, many fish samples had been sent to the senior author (N.R.K.) for identification. The specimens consisted one small catfish, that identical with the family Pangasiidae. Two years later, another fish specimen of the same group, was collected from Shatt Al-Basrah canal, Basrah province, south of Iraq. The invasion of such fish to the inland waters of

Mesopotamia, could affect the native fishes community negatively, since they have very large sizes in addition to their predatory mode (16; 27). According to Froese and Pauly (8) the family Pangasiidae consists of 4 genera and a total of 29 species. The present study was conducted to identity of the fish and to detect the source of the invasion.

Materials and methods

Two specimens of striped catfish were collected from two different localities in Iraq. The first specimen was 67.7 mm in total length, collected during a study on fish parasites of Ibn Najim marsh (32˚ 08' N, 44˚ 35' E) in the middle of Iraq during 2009. The second specimen was 312 mm in total length, captured during a survey on fishes of Shatt Al-Basrah canal (30°27'–30°28'N and 47°49'–47°50'E) south of Iraq in 2011. 12 local aquarium pangasiids Imported from the Philippines by local sellers of ornamental fish were examined for morphometric and meristic characteristics with intention to compare their characters with those of two wild fish specimens caught from middle and south of Iraq. The aid of digital calliper and Olympus dissecting microscope were used to measure of meristic and metric characters of fish. The measurements followed that clarified in Gustiano (10) which modified in Weicaszek *et al*. (27). The diagnosis of fish family and identification keys to genera and species followed Gustiano and Pouyaud (11). Gill rakers were counted on the first gill arches. All Specimens deposited in the department of fisheries and marine resources, College of Agriculture, Basrah University.

Results

Two specimens of striped catfish were recorded for the first time from two different natural waters in Iraq. The first specimen was 67.7 mm. in total length, collected during a study on fish parasites of Ibn Najim marsh in the middle of Iraq during 2009 (Fig. 1). The second specimen was 312 mm in total length, captured during a survey on fishes of Shatt Al-Basrah canal south of Iraq in 2011 (Fig.2). Twelve local ornamental pangasiids (Imported from the Philippines) were examined for morphometric and meristic characteristics for comparison (Fig. 3). The results indicated that the aquarium specimens are closely allied to the wild specimens, all were identical with the genus *Pangasianodon*. The studied fish had characters share with striped catfish *P. hypophthalmus* (Sauvage, 1878). Meristic characters (table 1), morphometric and metric characters (table 2) were clarified.

Fig.1. *P. hypophthalmus* specimen collected from Ibn Najim Marsh.

Fig. 2. *P. hypophthalmus* specimen collected from Shatt Al-Basrah canal.

Fig. 3: *P. hypophthalmus* specimen collected from local ornamental tank.

Table 1. Meristic characters of *P. hypophthalmus* of present study.

Character	Numbering of specimen													
	1*	2	3	4	5	6	7	8	9	10	11	12	13	14 **
Dorsal fin spine	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Dorsal fin ray	7	7	7	7	7	7	7	7	7	7	8	7	7	7
Pectoral fin spine	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pectoral fin ray	10	9	9	9	8	8	8	8	8	9	9	8	10	10
Pelvic fin ray	1+7	1+7	1+7	1+7	1+7	1+7	1+7	1+7	1+7	1+7	1+7	1+7	1+7	1+7
Anal fin ray	32	33	32	32	31	33	32	32	32	32	33	31	32	5+27

*Fish caught from Ibn Najim marsh, **Fish caught from Shatt Al-Basrah Canal, the remaining specimens caught from aquarium tanks.

Table 2. Morphometric and metrical measurements of *P. hypophthalmus* in hundredths of standard length (SL), and head length (HD).

Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Color	blue bars	blue bars	yellow bar	blue bars	yellow bar	blue bars	blue bars	blue bars	blue bars	blue bars	blue bars	blue bars	blue bars	blue bars
Date of collection	20 Mar.2009	Mar 2010						May 2010						Oct 2011
T. L.	67.73	76.8	86	112	109.73	128.5	125.2	97.92	107.41	87.38	101.5	101.71	95.4	312
S. L.	56.53	62.12	66.64	91.29	91.16	106.5	99.33	79.57	88.93	73.23	83.09	83.44	81.78	222
Head L.	14.99	15.08	18.3	22.57	20.36	26.46	28	20.56	22.89	17.8	24	21.9	20.23	58.7
H. depth	7.56	10.02	11.11	11.46	12.9	12.73	13.1	13.3	13.99	10.45	12.89	13.33	13.03	40.7
H. width	8.84	10.66	12.11	12.37	15.47	16.47	16.8	13.33	15.16	10.47	13.38	15.16	12.23	41.77
Eye diametre	4.88	3.26	3.71	4.84	3.56	6.22	6	4.89	5.52	3.75	4.98	5.48	3.82	11.35
Predorsal L.	20	22.29	26.68	33.7	31.83	40.6	38.5	31.73	35.15	27.88	32.95	32.85	29.15	95.08
Mandible barble L.	5.55	6.72	6.05	8.2	7.91	8.61	9.42	5.71	8.52	9.13	6.85	7.29	8.43	7.67
Maxill. barble L.	10.34	10.66	10.92	17.37	18.34	15.15	17.56	11.05	16.77	13.7	13.27	10.84	15.22	12.4
Gill rakers in first arch (total)		4,1, 15 (20)	4,1, 13 (18)	4,1,16 (21)	4,1, 14 (19)	-	4,1,15 (20)	-	-	-	4, 1, 15 (19)	-	4, 1, 12 (17)	4,1,27 (32)
Caudal peduncle L.	10.18	10.4	11.98	15.75	16.19	17.85	18.84	10.08	11.68	12.07	11.2	13.71	14.63	43.3

Table 2. Continued.

Fork L.	59.25	66.94	76.2	98.08	94.25	112.3	106.2	86.52	94.44	74.36	88.84	89.66	86.95	270
Snout L.	3.4	3.21	5.25	6.37	5.93	10.06	8.64	6.86	6.74	6.02	7.1	7.44	7.1	18.38
Anterior snout W. (3a)	2.76	3.3	3.74	5.06	4.02	5.6	5.85	4.32	5.45	4.3	5.09	7.17	6.52	11.56
Posterior snout L.(3b)	1.45	1.29	2.4	2.12	2.28	1.94	1.87	1.58	1.46	1.5	2.49	1.59	2.36	7.94
Caudal peduncle depth	4.1	4.8	5.82	7.24	6.46	12.2	9.9	6.94	7.76	5.35	6.82	8.43	6.31	22.57
Pectoral fin L.	10.67	10.76	12.43	12.91	13.6	18.37	19.4	14.3	18.21	11.94	12.66	13.84	12.66	46
Pectoral spine L.	8.02	8.49	11	11.64	11.67	14.53	16.38	12.69	12.63	13.1	11.16	12.9	10.63	36.47
Dorsal fin L.	12.32	12.08	13.27	18.7	17.53	21.66	17.65	15.55	16.94	15.34	15.68	15.9	15.28	54.85
Dorsal spine L.	10.6	9.03	11.39	13.36	14.06	17.12	14.02	12.5	13.93	10.08	12.87	13.4	111.15	40.57
Dorsal spine width	0.82	0.58	0.77	0.97	0.89	0.63	1.4	0.68	0.77	0.69	1.24	0.63	0.61	2.68
Pelvic fin L.	7.48	6.28	8.12	11.04	12.16	12.13	12.01	7.71	9.06	8.24	9.98	9.73	10.87	31.6
Anal fin height	8.7	7.6	10.5	12.9	12.62	13.7	16.38	11.03	11.66	10	11.24	11.47	11.57	30.1
Anal fin L.	16.61	20.79	21.06	29.65	28.69	33.22	33.17	26.13	27.49	20.8	26.96	25.8	25.86	34.14
Adipose fin H.	3.85	3.01	5.27	3.8	5.53	5.85	7.32	3.28	5.23	5.03	4.39	5.13	4.74	10.68
Adipose fin W.	1.26	1.32	1.56	2.37	2.42	2.01	2.92	1.68	2.07	1.57	1.92	1.84	1.93	4.31

Table 2. Continued.

Mouth W.	5.32	5.13	5.86	7.75	6.54	7.87	9.12	7.12	8.62	5.58	6.06	7.61	6.38	10.41
Lower jaw L.	2.92	3.08	3.4	5.28	4.38	3.63	5.27	3.64	4.44	3.15	3.84	3.33	3.33	11.93
Interorbital L.	6.55	7.53	10.94	12.25	13.72	13.61	13.53	10.85	13.93	7.85	12.36	13.19	10.27	37.1
Distance snout to isthmus	9.8	7.98	10.34	12.6	10.8	16.08	14.83	12.14	13.51	11.36	13.38	13.03	11.22	30.83
post ocular L.	6.44	7.25	9.05	11.92	12.07	13.42	14.73	11.99	12.76	9.2	11.6	10.78	10.84	36.24
Body W.	6.08	7.81	8.1	13.12	10.06	12	12.03	10.39	11.5	7..25	10.77	10.13	8.53	39.77
prepectoral L.	11.99	13.72	17.12	17.44	21.31	25.9	23.57	18.71	20.93	15.78	19.04	18.34	18.03	52.75
prepelvic L.	22.99	26.92	31.71	38.32	38.76	45.53	45.78	33.72	35.84	29.81	35.94	36.6	36.45	106.62
in % S. L.														
H. L.	26.03	24.27	27.46	24.72	22.33	24.84	28.18	25.83	25.73	24.3	21.84	26.44	24.73	26.44
H. depth	13.37	16.13	16.67	12.55	14.15	11.95	13.2	16.71	15.73	14.27	15.51	15.97	15.93	18.3
H. W.	15.64	17.16	18.17	13.55	16.97	15.46	16.91	16.75	17.04	14.29	16.1	18.17	14.95	18.81
Caudal ped. L.	14.31	10.67	15.93	14.08	17.67	16.76	18.96	12.66	13.13	16.48	13.47	16.43	17.89	19.5
Caud. Ped. Depth	7.25	7.72	8.73	7.93	7.08	11.45	9.96	8.72	8.72	7.3	8.21	10.1	7.71	10.16
Pectoral spine L.	14.18	13.66	16.5	12.75	12.8	13.64	16.49	15.94	14.2	17.88	13.42	15.46	13	16.43
Pectoral fin L.	18.87	17.32	18.65	14.14	14.92	17.25	19.53	17.97	17.3	16.3	15.23	16.58	15.48	20.72
Dorsal spine L.	18.75	14.53	17.09	14.63	15.42	16.07	14.11	15.7	15.66	13.76	15.48	16.06	13.63	18.27

Table 2. Continued.

Dorsal fin L.	21.79	19.44	19.91	20.48	19.23	20.33	17.76	19.54	19.04	20.94	18.86	19.05	18.68	24.7
Pelvic fin L.	13.23	10.11	12.18	12.09	13.34	11.39	12.09	9.68	10.18	11.25	12	11.66	13.29	14.23
Anal fin H.	15.39	12.23	15.75	14.13	13.84	12.86	16.49	13.86	13.11	13.65	13.52	13.74	14.14	13.55
Anal fin L.	29.38	33.46	31.6	32.47	31.47	31.19	33.39	32.83	30.91	28.4	32.44	30.92	31.62	38.13
Adipose fin H.	6.81	4.84	7.9	4.16	6.06	5.49	7.37	4.12	5.88	6.86	5.28	6.15	5.79	4.81
Adipose fin W.	2.22	2.12	2.34	2.59	2.65	1.88	2.94	2.11	2.32	2.03	2.31	2.2	2.36	1.94
Interorbital dis.	11.58	12.12	16.41	13.42	15.05	12.78	13.62	13.63	15.66	11.42	14.87	15.8	12.56	16.71
Body W.	10.75	12.57	12.15	14.37	11.03	11.26	12.11	13.05	12.93	11.74	12.96	12.14	10.43	17.91
Predorsal L.	35.37	35.88	40.03	36.22	39.05	38.12	38.76	39.87	39.52	38.07	39.65	39.37	35.64	42.83
Prepectoral L.	21.21	22.08	25.69	19.1	23.37	24.32	23.73	23.51	23.53	21.54	22.91	21.98	22.04	23.76
Prepelvic L.	40.66	43.33	47.58	41.97	42.52	42.75	46.09	42.37	40.3	40.7	43.24	43.86	44.57	48.16
IN % H. L.														
Snout L.	23.09	21.28	26.12	28.22	29.12	38.02	30.61	33.36	29.44	33.82	29.58	33.97	32.23	29.22
Anterior snout W.	18.75	21.88	18.6	22.42	19.74	21.16	20.73	21.01	23.8	24.15	21.2	32.74	32.23	18.37
Posterior snout L.	7.54	8.55	11.94	7.97	11.19	7.33	6.62	7.68	6.37	8.42	10.37	7.26	11.66	12.62

Table 2. Continued.

Eye Diam.	33.15	21.62	15.45	21.44	17.48	23.5	21.26	23.78	24.11	21.06	20.75	25.02	18.88	18.04
Mouth W.	36.14	34.02	29.15	34.33	32.12	29.74	32.32	34.63	37.65	31.34	25.25	30.86	31.53	36.75
Lower jaw L.	19.83	20.42	16.91	23.39	21.51	13.72	18.67	17.7	19.39	17.7	16	15.39	16.46	18.96
Distance snout-isthmus	65.37	52.32	51.44	55.82	53.04	60.77	52.55	59.04	59.02	63.82	55.75	59.5	55.46	49.01
Postocular L.	43.75	48.07	45.02	52.81	59.28	50.72	52.19	58.31	55.74	51.68	48.3	49.22	53.58	57.61
Dorsal spine width	5.47	3.84	3.83	4.29	4.37	3.13	5	3.3	3.36	3.87	5.16	2.87	3.01	4.26
Max. barb. L.	39.92	41.96	36.15	76.96	90.08	57.25	62.22	53.74	73.26	76.96	55.3	49.5	75.23	19.71
Man. Barb. L.	21.42	34.33	20.03	36.33	38.85	32.54	33.38	27.77	37.22	51	28.5	33.28	41.67	12.19

Discussion

Pangasiidae are large catfishes (full grown adults 20 cm to 3 m Most species attaining 50 cm or more), with maxillary barbles, a single pair of mental or mandibular barbles, branchiostegial rays 7-11, adipose fin invariably present. Pelvic fin with 6 or 7-8 rays. Anal fin 26-46 rays. Principal caudal fin rays 8/9. Vertebrae 39-52 (24).

The same authors revised the family Pangasiidae and recognized only two genera, *Helicophagus* Bleeker, 1858 with two valid species and *Pangasius* Valenciennes, 1840 with 19 valid species. Later one new species was added to the *Helicophagus* (15), and seven species to the *Pangasius* (20; 23; 17; 19; 12). Vidthayanon and Roongthongbaisuree (26) split the genus *Pangasius* to four subgenera, *Pangasius* (*Pangasionadon*) Chevy, 1930 with two species, *Pangasius* (*Pteropangasius*) Fowler, 1930 with two species, *Pangasius* (*Neopangasius*) Popta, 1904 with four species and *Pangasius* (*Pangasius*) with all remaining species. Pouyaud *et al*. (18) studied phylogenetic relationships among Pangasiids and they suggested that *Pangasianodon* and *Pteropangasius* could be elevated to the generic level. Pouyuad *et al*. (21) confirmed all subgenera in Vidthayanon and Roongthongbaisuree's study except *Pangasius* (*Neopangasius*) which is phylogenetic and should be included in *Pangasius* (*Pangasius*) based on molecular phylogenetic analysis. Gustiano (10) raised three subgenera that proposed in Vidthayanon and Roongthongbaisuree (26) to generic level. Ferraris (7) listed 30 species in five genera in the Pangasiidae, represented *Pangasius* (22 spp.); *Helicophagus* (3 spp.); *Pangasianodon* and *Pseudolais* all with 2 species and monotypic *Cetopangasius*. Gustiano and Pouyaud (11) distinguished four genera (*Helicophagus*, *Pangasianodon*, *Pangasius* and *Pteropangasius*) and provided a diagnostic characters and made keys to four genera of the Pangasiidae. Now *Helicophagus*, *Pangasianodon*, *Pangasius* and *Pseudolais* (syn. *Pteropangasius*) have 3, 2, 21 and 2 valid species respectively (8)

Preliminary identification of single specimen (photo) of Pangasiid caught from Ibn Najim marsh as *Pangasius* by Dr. Brian Coad of the Canadian Museum of Nature on 2009 (See Coad, 2010). Reexamination of the wild and ornamental specimens and we found that they have 8 pelvic fin rays, long predorsal length (more than 35 % Standard length), slender dorsal spine width (3.5-5% head length) that fall in characters of genus *Pangasianodon* which proposed by Gustiano and Pouyaud (11).

This genus was proposed by Chevey (6) for *P. gigas*, and distinguished it from closely related genus *Pangasius* on the bases of the absence of mandibulary barbles and teeth on the jaws and the palatine. The generic validity based on these characters which might be subject on age, led Smith (25) and other authors to get decision of doubtful validity of *Pangasianodon*. The controversy in the systematic status of *Pangasianodon* due to the unstable characters used in original description that studied only in adult specimens and the workers wait long time to caught juvenile for comparison (9). Fumihito (9) compared number of barbles, presence/absence of teeth and the position of eyes to the mouth level in 10 species of Pangasiidae belong to genera *Helicophagus*, *Pangasianodon*, *Pangasius* and *Pteropangasius*. She concluded that the teeth in the jaws, on the vomer and on the

vomerine extensions are entirely absent in the adults, and retained in at least up to 21.7 cm standard length of *P. gigas*, the position of the eyes below the mouth angle in adult, while being of higher position in juveniles as in *Pangasius* species. Roberts and Vidthayanon (24) recognized only *Pangasius* and *Helicophagus* and considered *Pangasianodon* as synonym of *Pangasius*.

The present meristic and morphometric and biometric measurements clarified in table 1 and based on the distinguished characters between *P. gigas* and *P. hypophthalmus* appeared in keys of Roberts and Vidthayanon (24), led us to conclude that the two wild and the 12 ornamental specimens have taxonomic characters of *P. hypophthalmus*, due to (i) development gill rakers (ii) head length less than 27 % of standard length (except in one ornamental specimen has 28.18 % S. L.) and (iii) mouth width less than 10 % standard length (except in Basrah canal specimen have 10.4 % S.L.). Although these minor differences found in some specimens not conspecific with that of *P. gigas* and it was considered intraspecific variation. Single specimen caught from Ibn Najim have relatively big eyes, but this case was considered as inflammatory reaction caused by the infection with the trematode *Diplostomum* metacercariae (cataract disease). Due to the small size of all specimens (Juveniles), the palatine and vomerine plates could not observed. Gill arches of *P. hypophthalmus* have small or rudimentary gill rakers which interspersed among larger rakers (24; 27). In the present study this peculiar circumstance was noticed only in wild specimen (relatively bigger specimen) which caught from Shatt Al-Basrah canal that given the higher counting of whole rakers (32 in compared with 17- 21 in other specimens). According to Wiecaszek *et al.* (27) number of gill rakers may increase with fish age. However the wide range in number of gill rakers of present sample fall within specific status of *P. hypophthalmus* that recorded in the literature.

It is necessary to use genetic studies for accurate classification of member of this family, So it frequently hybrid have been existed between different species and genera from aquaculture or cross breeding (27).

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أول تسجيل لسمكة الجري المخطط *Pangasianodon hypophthalmus* (Pisces: Pangasiidae) (Sauvage, 1878) من المياه الداخلية في العراق

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الخلاصة. عثر على نموذجين من أسماك الجري المخطط عائلة Pangasiidae من مسطحين مائيين مختلفين لأول مرة في العراق. جمع النموذج الاول بطول كلي 67.7 ملم من هور ابن نجم أثناء دراسة على طفيليات الأسماك في وسط العراق خلال عام 2009. جمع النموذج الثاني بطول كلي 312 ملم من شط البصرة أثناء مسح للأسماك المتواجدة هناك خلال عام 2011. فحص 12 نموذج من أسماك نفس العائلة من أحواض الزينة (المستوردة من الفلبين) وسجلت الصفات المظهرية والعددية لها لأجل المقارنة. أوضحت النتائج أن نموذجي المياه الطبيعية ينطبقا بمواصفاتهما مع عينات أحواض اسماك الزينة، وجميع النماذج صنفت على أنها سمك الجري من جنس *Pangasianodon* والنوع *P. hypophthalmus* (Sauvage, 1878). اعتبر التواجد الجديد لهذه الأسماك في المياه الطبيعية العراقية كنتيجة هروب من أحواض الزينة.