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Short communication:
Ichthyofauna of Gaawshan Dam Lake in Kurdistan Province of Iran

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Introduction

Gaawshan Dam Lake is a new dam reservoir constructed in 2004 is situated 50 Km away from Sanandaj city in Kurdestan Province of Iran. The lake is located at the latitude and longitude coordinates of 34°57’ 25" N and 47°05’ 42" E with an area of about 1500 hectares, 16Km long, 500-1500m wide and a maximum depth of 100 meters. The lake is principally fed by the Gaveh River in addition to a few small rivers that enter the lake. The Gaveh River exits the dam reservoir and then joins the Gheshlagh River and becomes the source of the Sirvan River in the northwest part of Iran. The present study examined species composition and ecological status of the ichthyofauna in the Gaawshan Dam Lake. This research is the first–ever reported on the ichthyofaunal of the Gaawshan Dam Lake, and will contribute to the database required for the conservation and sustainable utilization of this lake.

Materials and methods

Eight stations were selected in the Gaawshan Dam Lake (Table 1 and Fig. 1). Seasonal samplings were carried out with gillnets (20-60 mm mesh size) and beach seine (8 mm mesh size) between November 2014 and October 2015. Specimens were preserved in 5 percent formalin in the field and were observed in the laboratory. Fishes were identified based on morphological and meristic characteristics. 20 morphometric and 6 meristic characteristics were measured and counted, respectively for each specimen.

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Table1: Location of sampling stations.

St No	N	E
1	34˚57ʾ 38"	47˚00ʾ 58"
2	34°57ʾ 59"	47°02ʾ 10"
3	34˚57ʾ 39"	47˚05ʾ 28
4	34˚58ʾ 27"	47˚04ʾ 11"
5	34˚57ʾ 00"	47˚03ʾ 22
6	34˚55ʾ 57"	47˚03ʾ00 "
7	34˚56ʾ 04"	47°05ʾ 18"
8	34˚55ʾ 42"	47°10ʾ 07"

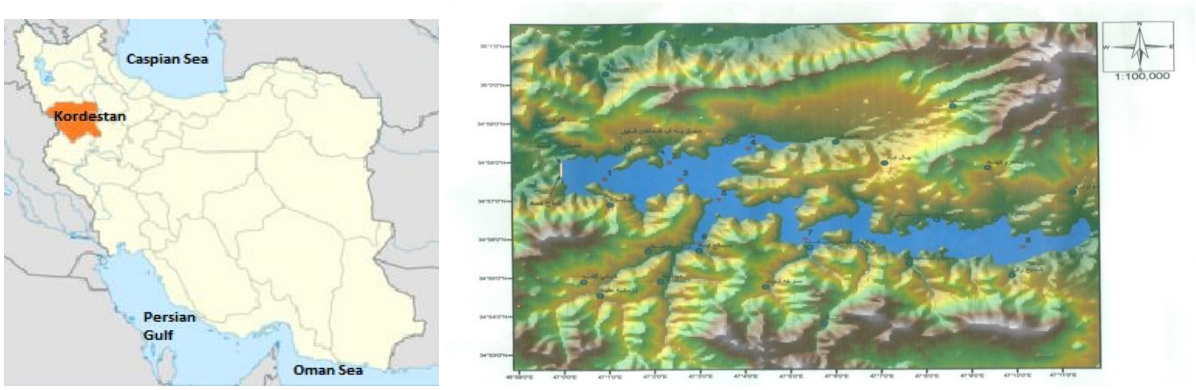


Figure 1: Map showing situation of the stations in the Gaawshan Dam Lake.

Results and discussion

The results of the study showed 11 fish species belonging to the Cyprinidae family in the Gaawshan dam lake (Table 2) which comprised 1182 individual specimens.

Table 2: Fish species of the Gaawshan Dam Lake.

Scientific name	Family	English name	Status: Native/Exotic
1 *Alburnus mossulensis*	Cyprinidae	Mossul bleak	Native
2 *Barbus lacerta*	Cyprinidae	kura barel	Native
3 *Capoeta damascina*	Cyprinidae	Mesopotamian barb	Native
4 *Capoeta trutta*	Cyprinidae	trout barb	Native
5 *Carassius gibelio*	Cyprinidae	Prussian carp	Exotic
6 *Ctenopharyngodon idella*	Cyprinidae	Grass carp	Exotic
7 Cyprinus carpio	Cyprinidae	Common carp	Exotic
8 *Hypophthalmichthys molitrix*	Cyprinidae	Silver carp	Exotic
9 *Luciobarbus esocinus*	Cyprinidae	Mangar	Native
10 *Luciobarbus pectoralis*	Cyprinidae	Orontes barbel	Native
11 *Squalius cephalus*	Cyprinidae	Chub	Native

Table 3: Morphometric features of fish species caught in the Gaawshan Dam Lake.

Species	N	TL	SL	HL	BD	TW	TL/HL	TL/BD
1 *A. mossulensis*	189	123.6±21.67	105.3±17.24	25.2±1.14	37.4±1.38	27.2±7.42	4.90±0.23	3.30±0.18
2 *B. lacerta*	14	223.4±21.32	201.3±18.73	41.7±1.42	39.3±1.37	153.2±23.45	5.35±0.37	5.73±0.23
3 *C.damascina*	122	262.3±34.42	221.4±22.67	46.3±2.56	56.7 ±2.32	172.5±31.27	5.66±0.54	4.62±0.41
4 *C. trutta*	236	194.5±23.52	168.3±21.16	35.6±1.54	47.6±.54	124.4±25.42	5.46±0.34	4.11±0.28
5 *C. gibelio*	26	182.4±19.35	151.2±16.67	43.1±1.32	59.5±1.22	148.3±28.52	4.23±0.45	3.06±0.38
6 *C. idella*	37	315.2±39.44	278.1±28.42	63.6±.2.46	65.3±1.62	346.5±48.35	4.95 ±0.42	4.82 ±0.36
7 *C. carpio*	128	326.4 ±41.21	285.6±31.52	64.1 ±2.37	72.1±1.57	587.3 ±86.54	5.09±0.35	4.52±0.45
8 *H. molitrix*	36	396.4±38.62	358.2 ±29.21	81.5±2.65	92.6±2.35	756.4±79.46	4.86±0.46	4.28±0.43
9 *L. esocinus*	86	297.2±28.21	273.4±3.38	69.2±23.37	61.7±1.76	41.6±56.32	4.29 ±0.36	4.82±0.43
10 *L. pectoralis*	35	275.3 ±32.41	244.3±25.32	58.4±2.28	56.2±1.46	215.3±36.72	4.71±0.48	4.89±0.35
11 *S. cephalus*	273	235.2 ±31.17	200.4±22.18	45.2±2.26	51.4±1.34	165.4±47.24	5.20±0.25	4.57±0.37

All measurements are in millimeters (mm): TL:Total Length; SL:Standard Length; HL: Head Length; BD:BodyDepth;TW:Total weight (g)

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In the Gaawshan Dam Lake, a total of 11 species were identified all of which belong to the Cyprinidae family. The family Cyprinidae is the largest family of freshwater fishes and various members of this family are important as food fish, aquarium fish and in biological research (Nelson, 2016).The fishes of the Gaawshan Dam Lake are divided into two groups, the first group includes seven native species including *Squalius cephalus*, *Luciobarbus esocinus*, *Barbus lacerta*, *Capoeta damascina*, *Alburnus mossulensis*, *L. pectoralis* and *C. trutta*. The second group consists of four exotic species including *Carassius gibelio*, *Cyprinus carpio*, *Ctenopharyngodon idella*, and *Hypophthalmichthys molitrix*. Three exotic species including *C.carpio*, *C. idella* and *H. molitrix* were introduced to this reservoir for aquacultural purposes. These Chinese carps also widely introduced to other reservoirs in inland water resources of Iran, are found naturally in the whole Caspian Sea drainage area (Abbasi *et al.*, 1999).These species are commercially raised in Iran for sale in the local market and are found almost all over Iran.

C. *gibelio* has accidentally entered the lake with other exotic species (Coad, 1996). *S. cephalus*, *C. trutta* and *A. mossulensis* are the most abundant species in the study area. These species have an economic value for human consumption. *S. cephalus* has economic importance including sport fishing. One of the most important morphometric parameters is the ratio of TL HL^{-1} and referring to the Table 3 the TL HL^{-1} ratio for this species was 5.20. According to previous reports it was reported as 4.5 by Ramin *et al.* (2014); 4.45 by Najafpour (1996); 4.46 by Sadeghinejad (2001); and 4.28 by Mohaghegh (2002). It is widespread in the northern parts or Iran including the Eastern basin of the Urmia Lake (Ghasemi and Ramin, 2013). *A. mossulensis* was recorded from the Tigris River, Lake Maharlu, Kor River and the upper reaches of the Hurmuz Basins (Berg, 1964; Bianco and Banarescu, 1982; Abdoli, 2000). This species is abundant and appears to be under no threat in Iran. The average ratio of TL HL^{-1} in the present study was 4.90. According to the previous report of Najafpour (1996) it was 4.98. *L. esocinus*, *L. pectoralis*, *C. damascina* and *C. trutta* have economic value and the local people catch and use them as food fish. In recent years the stocks of *L. esocinus* and *L. pectoralis* have reduced. The important reasons for the decline of some fish species are overfishing, deterioration of their spawning grounds and restrictions of their habitats (Ramin and Doustdar, 2012a). *L. esocinus* is distributed in the Tigris River basin. In the past years this species was abundant in the Kharkheh, Dez and Karun River basins in the west and southwest of Iran (Ramin and Doustdar, 2012b). According to IUCN criteria this species is classified as a vulnerable species (IUCN Redlist, 2016). The average ratio or TL HL^{-1} in the present study was 4.29. According to Ramin (2000) it was 5.10. The average ratio of T.L $H.L^{-1}$ of *L. pectoralis* in this study was 4.71. It was reported as 5 by Ramin and Doustdar (2017); 4.8 by Almaca (1986); 4.9 by Najafpour (1996) and 4.7 by Sadeghinejad (2001). The average ratio of TL/ BD in this study was 4.89. TL/BD ratio was 4.7 according to

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Ramin and Doustdar (2017); 4.9 according to Almaca (1990), and Sadeghinejad (2001), and 4.8 as reported by Najafpour (1996). *C. damascina* is widely distributed in all the inland waters of Iran and is not included in the Red List. The average ratio of TL HL^{-1} in *C. damascina* was 5.66. It was reported previously as 5.61 by Ramin *et al.* (2014); as 5.67 by Sadeghinejad (2001); as 5.18 by Mohaghegh (2002); as 5.62 by Najafpour (1996) and as 4.97 by Ebrahimi (1997). *C. trutta* has the highest abundance in the Dez River basin (Ramin and Doustdar, 2012b) and no conservation activities are needed. *C. trutta* is economically important and shows good market value in the west of Iran. The ratio of TL/HL in this study was 5.46. Previous studies by Najafpour (1996) and Sadeghinejad (2001) calculated it as 5.83 and 5.58, respectively. *Barbus lacerta* does not have economic importance and is widely distributed in the south Caspian Sea basin, Urmia Lake basin and Tigris River basin (Coad, 2017).The TL HL^{-1} ratio in this study was 5.35 in comparison with Ramin (2000) who reported it as 4.40.

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