

Ichthyofauna of Gahar Lake and Gahar River, Lorestan Province, Iran

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Abstract

During a survey of Gahar Lake and Gahar River from 2008 to 2009 some specimen obtained by seasonal sampling in 6 stations, 3 stations in the lake and 3 stations in the river. Three different methods were used for sampling, gill net and hook in the lake and electrofishing in the river. Due to the results 3 species from 2 families in Gahar Lake and 12 species from 3 families in Gahar River were identified. Most of the fish species belonged to Cyprinidae and Salmonidae families. Distribution and abundance of species were recognized. *Oncorhynchus mykiss* in Gahar Lake and *Capoeta damascina* in Gahar River had the most abundance.

Keywords: Ichthyofauna, Gahar Lake, Gahar River, Salmonidae, Cyprinidae

Introduction

Gahar Lake is situated within the Tigris drainage and Zagross mountains at 2400 m above the sea level. It is a tectonic and freshwater lake with about 100 ha vastness, 1700m length and 600m width with a maximum depth of 28 m (Afshin, 1994).

The lake is a protected area and is located at latitude and longitude coordinates of $33^{\circ}18'23''$ N and $49^{\circ}17'2''$ E.

Gahar Lake is principally fed by upstream waters during periods of heavy flow; in addition there are a few small springs at the lake bottom.

At western part of the lake water body exits and originate Gahar River. The river is about 52km and ends in Cezar River, which joins Dez and finally Karoon River (Afshin, 1994). The present study examines specific composition and ecological status of ichthyofauna in Gahar Lake and Gahar River.

This research is the first report on Gahar Lake and Gahar River ichthyofauna and would contribute to the database required for conservation and sustainable utilization of Gahar Lake and Gahar River.



Figure 1: View of Gahar lake.

Materials and methods

Three stations were selected in Gahar Lake, at latitude and longitude coordinates of $33^{\circ}18'16''$ N and $49^{\circ}17'31''$ E, $33^{\circ}18'19''$ N and $49^{\circ}16'50''$ E, and $33^{\circ}18'41''$ N and $49^{\circ}16'34''$ E; also three stations were selected in Gahar River at latitude and longitude coordinates of $33^{\circ}18'51''$ N and $49^{\circ}16'40''$ E, $33^{\circ}20'12''$ N and $49^{\circ}13'26''$ E, $33^{\circ}20'45''$ N and $49^{\circ}2'7''$ E (Fig. 2). Between March 2010 and October 2011

seasonal samplings were done with gillnet (Fig. 3), hook and electrofishing. The specimens were preserved in 5% formalin and were transferred to the laboratory for further examinations. Fishes were identified based on morphologic and meristic characteristics. 20 morphometric and 6 meristic characteristics were recorded for each specimen.

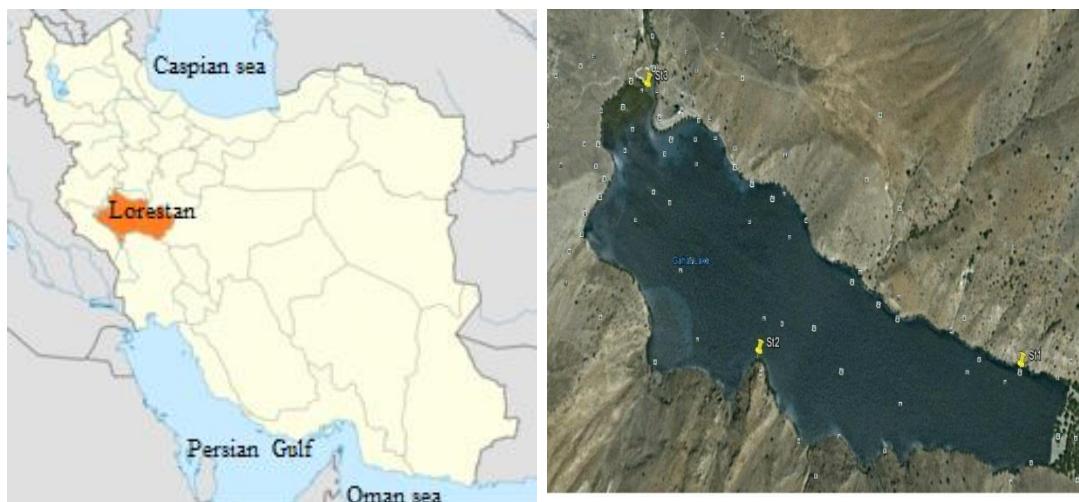


Figure 2: Map showing situation of the stations in Gahar lake.



Figure 3: Catch of fishes by gill net.

Results

The results showed that 3 fish species belonged to 2 families were recorded in Gahar Lake (Table 1), and 12 fish

species belonged to 3 families were recorded in Gahar River (Table 2) which comprised 137 and 198 individual specimens; respectively.

Table 1: List of identified fish species from Gahar River

	Scientific name	Family	English name
1	<i>S.trutta fario</i>	Salmonidae	Brown trout River trout
2	<i>O.mykiss</i>	Salmonidae	Rainbow trout
3	<i>C.damascina</i>	Cyprinidae	Mesopotamian barb

Table 2: List of identified Fish species from Gahar River.

	Scientific name	Family	English name
1	<i>C.damascina</i>	Cyprinidae	Mesopotamian barb
2	<i>C. trutta</i>	Cyprinidae	Trout barb
3	<i>Tor grypus</i>	Cyprinidae	Large scaled barb
4	<i>Squalius cephalus</i>	Cyprinidae	European chub
5	<i>Alburnoides bipunctatus</i>	Cyprinidae	Riffle minnow
6	<i>Cyprinion macrostomum</i>	Cyprinidae	Tigris kingfish
7	<i>Chondrostoma regium</i>	Cyprinidae	King nase minnow
8	<i>Garra rufa</i>	Cyprinidae	Stone fish
9	<i>Kosswigobarbus kossigli</i>	Cyprinidae	Kosswig's barbel
10	<i>O. mykiss</i>	Salmonidae	Rainbow trout
11	<i>S.trutta fario</i>	Salmonidae	Brown trout River trout
12	<i>Oxynoemacheilus frenatus</i>	Nemacheilidae	Tigris loach

Table 3 shows the distribution of fish species in the Gahar Lake and Table 4

shows the distribution of fish species in Gahar River .

Table 3: Distribution of species in Gahar Lake.

	Scientific name	St1	St2	St3
1	<i>O.mykiss</i>	*	*	*
2	<i>S.trutta fario</i>	*	*	*
3	<i>C.damascina</i>		*	*

Table 4: Distribution of species in the Gahar River .

	Scientific name	St1	St2	St3
1	<i>C. damascina</i>	*	*	*
2	<i>C. trutta</i>		*	*
3	<i>T.grypus</i>		*	*
4	<i>S.cephalus</i>		*	*
5	<i>A.bipunctatus</i>		*	*
6	<i>C.macrostomum</i>			*
7	<i>C.regium</i>			*
8	<i>G.rufa</i>			*
9	<i>K.kossigli</i>		*	*
10	<i>O.mykiss</i>	*	*	*
11	<i>S.trutta fario</i>	*		
12	<i>O.frenatus</i>		*	*

Table 5 shows some results of morphometric features of fish species in Gahar Lake, and Table 6 shows some

results of morphometric features of fish species in Gahar River.

Table 5: Morphometric features of fish species caught in Gahar Lake (Mean \pm SD).

	Species	N	TL	SL	HL	BD	TW	TL/HL	TL/BD
1	<i>O. mykiss</i>	93	292.5 \pm 49.65	263.2 \pm 41.82	61.3 \pm 1.85	60.4 \pm 1.92	263.6 \pm 87.2	4.77 \pm 0.23	4.55 \pm 0.26
2	<i>S. trutta fario</i>	5	289.2 \pm 40.82	255.3 \pm 45.11	59.5 \pm 1.57	62.3 \pm 1.88	267.5 \pm 40.55	4.86 \pm 0.47	4.64 \pm 0.39
3	<i>C. damascina</i>	39	295.6 \pm 38.44	251.4 \pm 34.21	53.3 \pm 3.15	64.7 \pm 4.2	281.2 \pm 74.12	5.61 \pm 0.31	4.61 \pm 0.26

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

Table 6: Morphometric features of fish species caught in Gahar River (Mean \pm SD).

	Species	N	TL	SL	HL	BD	TW	TL/HL	TL/BD
1	<i>C. damascina</i>	65	285.1 \pm 43.21	237.2 \pm 35.18	49.4 \pm 1.43	58.2 \pm 1.33	232.6 \pm 57.26	5.76 \pm 0.43	4.89 \pm 0.36
2	<i>C. trutta</i>	28	265.5 \pm 37.44	221.3 \pm 32.15	46.7 \pm 1.37	51.3 \pm 1.48	185.8 \pm 43.52	5.68 \pm 0.24	5.17 \pm 0.26
3	<i>T. grypus</i>	12	249.3 \pm 29.52	211.4 \pm 28.72	47.6 \pm 1.22	44.1 \pm 1.38	143.5 \pm 35.82	5.23 \pm 0.35	5.65 \pm 0.41
4	<i>S. cephalus</i>	15	235.2 \pm 27.42	199.6 \pm 23.21	52.2 \pm 2.15	50.3 \pm 1.76	162.7 \pm 39.24	4.50 \pm 0.18	4.67 \pm 0.23
5	<i>A. bipunctatus</i>	9	123.6 \pm 25.32	105.5 \pm 21.58	25.4 \pm 1.2	30 \pm 1.34	35.3 \pm 8.72	4.86 \pm 0.38	4.1 \pm 0.25
6	<i>C. macrostomum</i>	17	210.3 \pm 28.23	173.4 \pm 22.42	41.5 \pm 1.46	53.2 \pm 1.47	125.8 \pm 28.65	5.18 \pm 0.24	3.95 \pm 0.17
7	<i>C. regium</i>	8	239.7 \pm 27.33	205.2 \pm 22.82	39.4 \pm 1.25	48.1 \pm 1.32	136.5 \pm 31.44	6.11 \pm 0.53	4.98 \pm 0.42
8	<i>G. rufa</i>	6	127.6 \pm 23.62	102.2 \pm 22.52	23.1 \pm 1.12	26.7 \pm 1.23	38.2 \pm 8.52	5.52 \pm 0.46	4.78 \pm 0.36
9	<i>K. kosswigi</i>	3	159.3 \pm 27.25	137.5 \pm 26.38	31.6 \pm 1.26	39.2 \pm 1.3	52.4 \pm 10.17	5.12 \pm 0.45	4.06 \pm 0.27
10	<i>O. mykiss</i>	25	262.5 \pm 31.41	235.2 \pm 39.11	54.1 \pm 1.5	56.7 \pm 1.72	182.4 \pm 45.32	4.85 \pm 0.37	4.62 \pm 0.28
11	<i>S. trutta fario</i>	7	253.3 \pm 30.15	225.6 \pm 28.52	51.2 \pm 1.62	54.3 \pm 1.46	173.7 \pm 53.25	4.94 \pm 0.52	4.75 \pm 0.41
12	<i>O. frenatus</i>	5	63.3 \pm 12.4	46.1 \pm 11.12	11 \pm 0.41	9.3 \pm 0.44	48.2 \pm 7.1	5.75 \pm 0.19	6.78 \pm 0.27

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

Discussion

The study area is considered as a protected area and people are only allowed to visit the lake and river during summer. Due to protection of this interesting habitat, not enough studies have been carried out before and this study could be the first complete record of fish fauna in Gahar Lake and Gahar River.

In Gahar lake, three species including *O.mykiss*, *Salmo trutta fario*

and *C.damascina* were identified. *O. mykiss* as the most abundant species is an exotic species (Coad, 1996b), and it was found all over the lake and river. On the other hand, two other species are native (Coad, 1995). Only a few specimens of *S. trutta fario* were collected, but *C. damascina* showed higher abundance comparing with *S. trutta fario*.

In Gahar River, a total of 12 species were identified belonging to two families of Salmonidae and Cyprinidae. 4

species of *C. Macrostomum*, *C. regium*, *K. kosswigi* and *G. rufa* were rare with considerably small number of specimens. This finding is in agreement with previous studies (Bianco and Banarescu, 1982; Coad, 2013). The family Cyprinidae is the largest family of freshwater fishes and various members of this family are important as food fish, as an ornamental species for aquariums and also medical treatments (Nelson, 2006). Salmonidae family has high value in sport and commercial fisheries (Nelson, 2006). *O. mykiss* was introduced to Iran about 1966 for aquaculture purposes (Coad, 2010) and also was released into different inland water resources including lakes, rivers and streams. This species is exotic and does not need conservation (Coad, 1996b). It is commercially raised in Iran for local sale and found in the upper regions of Alborz and Zagros mountains. *S. trutta fario* is valued for sport fishing in some lakes of Iran (Kiabi *et al.*, 1999). Based on morphologic measurements of *S. trutta fario* presented in Table 6, obtained ratio of TL/HL and TL/BD were 4.94 and 4.75 which is in agreement with findings of Ghasemi (1998). According to IUCN criteria this species is classified as a vulnerable species (Kiabi *et al.*, 2004) and therefore further conservations should be taken into consideration. *C. damascina* is the most abundant species in the study area and has an economic value for human consumption. One of the most important morphometric parameter is

TL/HL and referring to Table 6, the TL/HL ratio for this species in Gahar Lake and Gahar River were calculated to be 5.61 and 5.76, respectively. These values were reported previously by Sadeghinejad (2001) as 5.67; Mohaghegh (2002), 5.18 and Najafpour (1996), 5.62. It is widely distributed in the whole inland waters of Iran and is not in the Red List. The ratio of TL/HL in Gahar River was 5.68. According to findings of Najafpour (1996) it was calculated to be 5.83 and Sadeghinejad (2001) 5.58. Considering the other inland water species, *Capoeta trutta* has the most abundance in Dez River basin (Ramin and Doustdar, 2012b) and no conservation activities are needed. The ratio of TL/HL and TL/BD of *T. grypus* in Gahar River were 5.23 and 5.65 respectively, compared with values of 5.03 and 5.62 for Khuzestan Province waters (Ramin, 2000). *T. grypus* is the most abundant species in the Karkheh River basin (Ramin, 2009). In recent years, the biomass of this species has been reduced. In total, the most important reasons for decline of some fish species are due to overfishing, deterioration of their spawning grounds and restriction of their habitats (Ramin and Doustdar, 2012a). *Squalius cephalus* (Table 6) has economic importance including sport fishing value. The ratio of TL/HL in the Gahar River was 4.5. According to the previous reports Najafpour (1996) reported it as 4.45; Sadeghinejad (2001) 4.46 and Mohaghegh (2002) 4.28. It is widespread in the northern half parts of

Iran including East basin of Urmia Lake (Ghasemi and Ramin, 2013). *Alburnoides bipunctatus* has no economic importance but can be considered for sport fishing. The ratio of TL/HL of this species in Gahar River was 4.86 comparing to 4.72 in findings of Mohaghegh (2002). From point of view of distribution pattern, it is found in river drainages of the southwest Caspian Sea (Abbasi *et al.*, 1999) and as the first report for the study area in southwest of Iran. It was reported by Ghasemi (1998) from East Azarbaijan Province of Iran. *C.macrostomum* has not economic value and is found in the Tigris River basin including Khersan, Jarrahi, Marun and Gamasib rivers (Berg, 1949). The ratio of TL/HL in Gahar River was calculated to be 5.18 comparing with the values of 5.33 (Najafpour, 1996) and 5.43 (Sadeghinejad, 2001). It is widely distributed in southern areas particularly Khuzestan Province (Southwest Iran) and does not appear to be threatened. *C.regium* does not have economic value. This species is found in Tigris basin and is not widely used as food therefore there is no need for conservation of this species in Iranian inland waters. The ratio of TL/HL in Gahar River was 6.11. According to Najafpour (1996) it was 6.3 and Sadeghinejad (2001) reported it to be 6.0. Nowadays, *G. rufa* is used for curing skin diseases. It is found in the Tigris River basin, Kor River and Hormoz basin (Bianco and Banarescu, 1982; Abdoli, 2000). It was also reported in Aras River (Kara *et al.*,

2010). The ratio of TL/HL in the Gahar River was 5.52. This ratio was estimated as 6.04 (Sadeghinejad, 2001) and 4.98 (Najafpour, 1996). This species has a wide distribution and is not threatened. *K.kosswigi* does not have any economic value, and is found in Tigris River basin up to Saymaren and Armand rivers (Coad, 2013). The ratio of TL/HL and TL/BD in the Gahar River were 5.12 and 4.06, respectively. According to Ramin (2000) they were 5.35 and 4.03. This species is rare and there is no previous research on it. *Oxynoemacheilus frenatus* does not have economic importance and is found in Tigris River basin (Abdoli, 2000). The TL/HL ratio in Gahar River was 5.75 in comparison with Sadeghinejad (2001) findings with a higher value of 6.13. Regarding to this species more and further data collection is proposed.

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