

The ichthyofauna of the Beshar River in Kohkiluyeh and Boyer-Ahmad Province, southwest Iran

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We report the results of the monitoring and investigation of the ichthyofauna of the Beshar River, one of the tributaries of the Tigris–Euphrates basin in Kohkiluyeh and Boyer-Ahmad Province, southwest Iran. The results showed that during a period from 2010 to 2011, a total of 13 fish species belonging to four families and three orders were recorded in the Beshar River. The results showed that among families of ichthyofauna, the large family was Cyprinidae with nine species and 69.2 percent abundance and the dominated species was the *Garra rufa* with 30.3 percent abundance. The Beshar River ichthyofauna is a combination of fauna and includes 6.5, 14.3 and 17.7 % of species, family and order of Iran freshwater fish fauna respectively.

Key words: Ichthyofauna, Beshar River, Cyprinidae, *Garra rufa*, Iran

INTRODUCTION

Iran is a mountainous country and be a part of the Eurasia and Middle East (Coad, 1987; Bănărescu and Coad, 1991). Kohkiluyeh and Boyer-Ahmad province is part of the Zagros range and mostly mountainous in topography. Although the province has abundant water resources, but had the fish fauna has not been well studied and researched. The Beshar River is one of the most important aquatic ecosystems in this province and it is a tributary of the Tigris–Euphrates basin that after getting into the Khersan River joins to the Karun River. The aim of this study was to determine taxonomic composition of the fish fauna of the Beshar River in southwestern of Iran.

MATERIAL AND METHODS

This study was carried out from 2010 to 2011 in the Beshar River one of the tributaries of the Tigris–Euphrates basin. The fish specimens were collected using an electrofishing device and cast nets at five stations in the Beshar River (Fig.1, Fig.2, and Table.1). All specimens were fixed and preserved in 10% formaldehyde solution. Identification of specimens was based on Abdoli (2000) and Coad (2013).

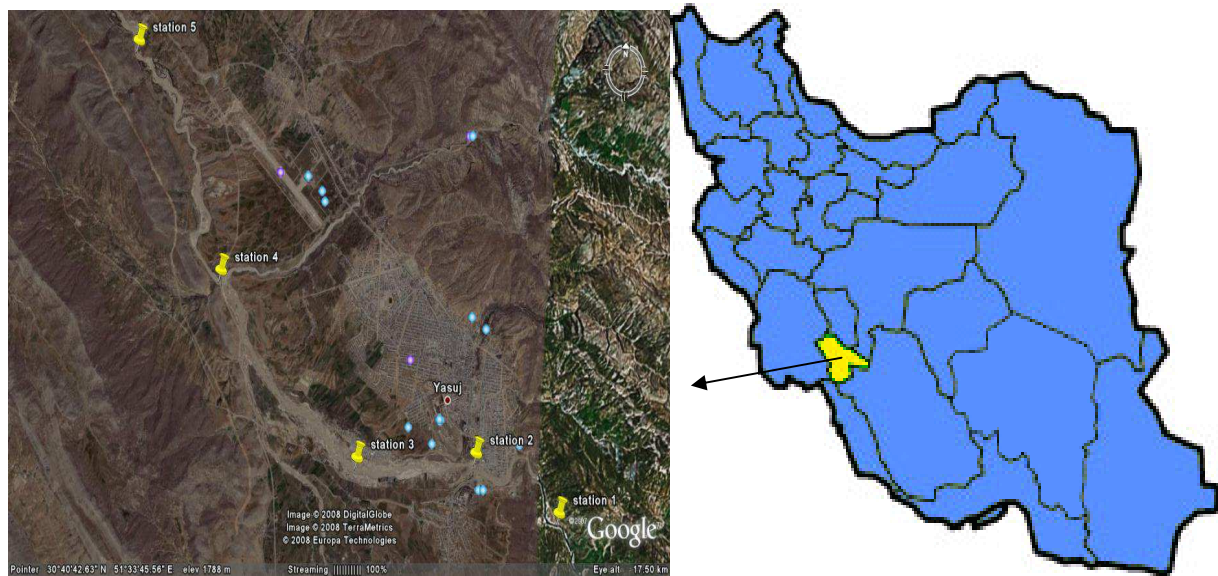


FIGURE 1. - Sampling stations in the Beshar River basins.

TABLE 1. Description of sampling sites in the Beshar River basin, Kohkiluyeh and Boyer-Ahmad Province, southwest of Iran

Sampling site	Longitude	Latitude
S1	51°38'16"	30°37'45"
S2	51°38'23"	30°39'03"
S3	51°31'40"	30°40'47"
S4	51°30'09"	30°43'21"
S5	51°25'21"	30°47'16"

RESULTS

Based on field surveying and laboratory analysis the 13 fish species belonging to 10 genera, three families, and three orders were identified from the Beshar River (Tables 2, 3). On the other hand, distributions of fish fauna in the Beshar River, based on the sampling stations are shown in Table 4. Moreover, the relevant photos of the some studied species are presented in figure 3.



FIGURE 2. Sampling stations and habitats.

TABLE 2. List of Fish fauna identified from the Beshar River.

Scientific Name	Status
Family: Cyprinidae	
<i>Lucciobarbus barbulus</i> (Heckel, 1847)	Native
<i>Barbus lacerta</i> (Heckel, 1843)	Native
<i>Capoeta aculeata</i> (Valenciennes, 1844)	Native/Endemic
<i>Capoeta barroisi</i> (Lortet, 1894)	Native
<i>Capoeta damascina</i> (Valenciennes, 1842)	Native
<i>Alburnus mossulensis</i> (Heckel, 1843)	Native
<i>Chondrostoma regium</i> (Heckel, 1843)	Native
<i>Cyprinion</i> cf. <i>macrostomum</i> (Heckel, 1843)	Native
<i>Garra rufa</i> (Heckel, 1843)	Native
Family: Nemacheilidae	
<i>Paracobitis</i> cf. <i>malapterura</i> (Valenciennes, 1846)	Native/Endemic
<i>Turcinoemacheilus hafezi</i> (Golzaripour, Abdoli, Patimar & Freyhof, 2013)	Native/Endemic
Family: Sisoridae	
<i>Glyptothorax</i> cf. <i>silviae</i> (Coad, 1981)	Native/Endemic
Family: Salmonidae	
<i>Oncorhynchus mykiss</i> (Walbaum, 1792)	Exotic

TABLE 3. Orders and families of fish fauna identified from the Beshar River.

Order	Family	No. of genera	%	No. of species	%
Cypriniformes	Cyprinidae	6	60	9	69.2
	Nemacheilidae	2	20	2	15.4
Siluriformes	Sisoridae	1	10	1	7.7
Salmoniformes	Salmonidae	1	10	1	7.7
Total	3	4	100	13	100

TABLE 4. Distribution of fish fauna identified from the Beshar River, based on a sampling site.

Scientific Name	S1	S2	S3	S4	S5
<i>Lucciobarbus barbulus</i>	---	---	√	√	√
<i>Barbus lacerta</i>	√	√	√	√	√
<i>Capoeta aculeata</i>	√	√	√	√	√
<i>Capoeta barroisi</i>	√	√	√	√	√
<i>Capoeta damascina</i>	√	√	√	√	√
<i>Alburnus mossulensis</i>	√	√	√	√	√
<i>Chondrostoma regium</i>	√	√	√	√	√
<i>Cyprinion</i> cf. <i>macrostomum</i>	---	---	√	√	√
<i>Garra rufa</i>	√	√	√	√	√
<i>Paracobitis</i> cf. <i>malapterura</i>	√	√	---	√	√
<i>Turcinoemacheilus hafezi</i>	√	√	---	√	---
<i>Glyptothorax</i> cf. <i>silviae</i>	√	---	---	√	---
<i>Oncorhynchus mykiss</i>	---	---	---	√	√

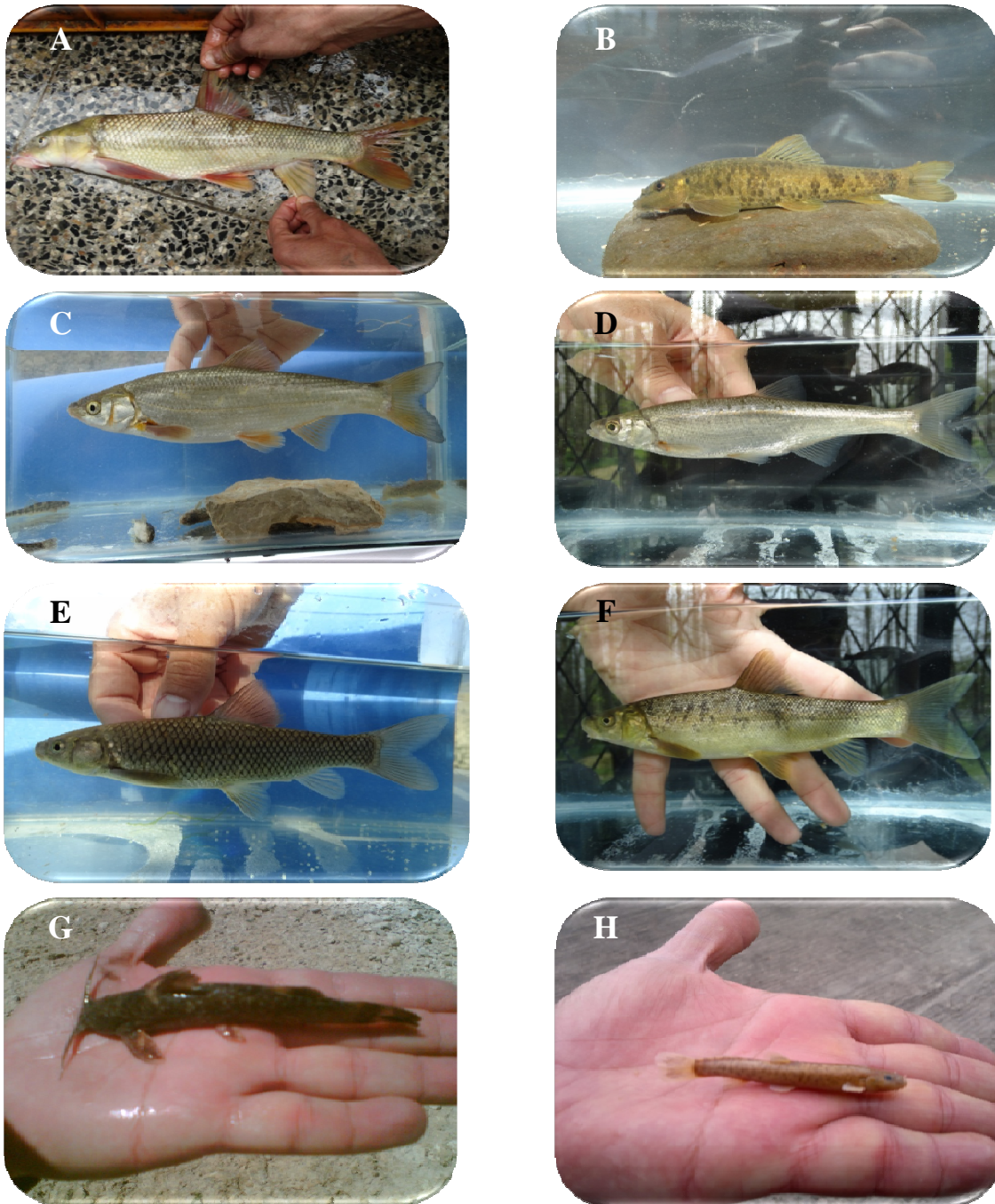


FIGURE 3. Photographs of the species in the Beshar River: (A) *Lucciobarbus barbulus*, (B) *Garra rufa*, (C) *Chondrostoma regium*, (D) *Alburnus mossulensis*, (E) *Capoeta aculeate*, (F) *Capoeta damascina*, (G) *Glyptothorax* cf. *silviae*, (H) *Paracobitis* cf. *malapterura*.

DISCUSSION

Fish surveys and species records are important for assessing the distribution and status of species and provide useful information for basic and applied ecology. As a matter of fact ichthyofauna of the Iran and status of species and population are not yet well understood (Coad, 2013; Esmaili et al., 2010). As regards of deficiency of scientific reports about a study of ichthyofauna in the Beshar River, this research and study about the fish fauna is the first scientific reports in the Beshar River.

Based on specimens collected during this investigation, 1511 fish specimens, belonging to three orders, four families, 10 genera and 13 species were recognized in the Beshar River (Table 2). Captured species in this research are as follows: nine species Cyprinidae, two species Nemacheilidae, one species Sisoridae and one species Salmonidae. Among the specimens collected in the Beshar River, 80% were Cypriniformes, 10% Salmoniformes, and 10% Siluriformes. The most abundant species were *Garra rufa* with 459 individual and 30.3 percent abundance. In accordance with the lists by Esmacili et al (2010) Iran has 202 freshwater fish species, belonging to 17 orders and 28 families, which distributed throughout 19 major drainage basins based on river systems (Coad, 1995). Thus, according to Esmacili et al (2010), the ichthyofauna identified in the Beshar River in this research was approximately 5.6, 14.3 and 17.7 % of species, family and order of Iran freshwater fish fauna respectively. The inland water ichthyofauna of Iran is dominated by the family Cyprinidae (Coad, 2013; Esmacili et al., 2010). As a result, the fish fauna of the Beshar River was dominated by Cyprinidae (Table 3). Iran's ichthyofauna contains both Ethiopian and Oriental elements, although it is principally part of the Palearctic Realm (Coad, 1987). The Beshar River is a habitat for several native fish species. Most of the collected species (12 sp.) are native to the Beshar River, but only one species (*Oncorhynchus mykiss*) from aquaculture farms is introduced to this River and is an exotic species. Among 13 fish fauna distinguished in the Beshar River, four species are endemic species in Iran and, therefore, conservation of species and genetic diversity of this fish fauna is very important. According to the previous fish fauna survey of the Iran (Abdoli et al., 2011), the endemic reported species in this research, such as *Paracobitis* cf. *malapterura* and *Turcinoemacheilus hafezi* was not previously recorded from the River Tigris like Beshar River basin. On the other hands, recent field investigations by Golzarianpour et al, (2013), in the Iranian Tigris basin from the Karoun and Dez River, *Turcinoemacheilus hafezi* as a new endemic species is distinguished and introduced. Moreover, by Coad (2006) and Abdoli (2000) has also reported *Glyptothorax silviae* as an endemic species in the Tigris basin such as, the Karun and middle to lower the Khersan, and middle to lower the Dez Rivers and in the Mond and Shur Rivers of the Bushehr basin. Therefore *Glyptothorax* cf. *silviae* was not previously recorded from the Beshar River. According to Teimori et al (2010) 24 species belonging to 20 genera, nine families, and six orders from the Kor River basin and 21 species belonging to 19 genera, eight families, and six orders from Helleh basin were identified. Among the Kor, Helleh and Beshar, the Kor and Helleh basin shows the greatest fish species diversity, followed by the Beshar River. Data from the present study indicate that the ichthyofauna of the Beshar River differs from that of the Kor basin and most of the species recognized in this River is the same as the Helleh basin. On the other hand, some genera and species of the Beshar River such as *Glyptothorax* cf. *silviae*, *Paracobitis* cf. *malapterura* and *Cyprinion* cf. *macrostomum* are not well understood and requires through systematic investigation using both molecular and morphological data.

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