

# New record of three freshwater fish species from a western drainage of Lake Urmia for the Turkish fauna

## Urmia Gölü'nün batı drenajından Türkiye faunası için üç yeni tatlısu balık türü kaydı

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**Abstract:** In the scope of this study, three freshwater fish species were newly recorded for Turkey from a western drainage of Lake Urmia: *Alburnoides petrubanarescui*, *Alburnus atropatenae* and *Oxynoemacheilus elsae*. All of them were found in headwaters of Nazli-chay River in the basin of the hypersaline Lake Urmia. The Lake is fed by many small springs and thirteen permanent rivers. However, it is still seriously threatened and drying up rapidly. In the previous studies, the existence of a stream in the western part of the Urmia Lake within border of Turkey was not mentioned.

**Keywords:** Anatolia, Nemacheilidae, Leuciscidae, first record

**Öz:** Bu çalışma kapsamında, Urmia Gölü'nün batı drenajından Türkiye için üç yeni tatlı su balığı türü bildirilmiştir: *Alburnoides petrubanarescui*, *Alburnus atropatenae* ve *Oxynoemacheilus elsae*. Bu türlerin hepsi yüksek tuzluluğa sahip Urmia Gölü havzasındaki Nazlı Çay'ın membalarında tespit edilmiştir. Bu göl, birçok küçük su kaynağı ve 13 devamlı nehir ile beslenmektedir. Ama yine de ciddi tehdit altındadır ve hızla kurumaktadır. Daha önceki çalışmalarda, Urmia Gölü havzasının batı kesiminde Türkiye sınırları içerisinde ki akarsuların mevcudiyetinden bahsedilmemiştir.

**Anahtar kelimeler:** Anadolu, Nemacheilidae, Leuciscidae, yeni kayıt

## INTRODUCTION

Lake Urmia (also known as Orumiyeh) is located in northwest Iran. The lake is one of the largest permanent hypersaline lakes in the world and has an importance on biodiversity in the area (Kelts and Shahrabi, 1986) but the lake level has fallen dramatically during the last decades, and the salinity of the lake has strongly increased due to human activities and poor management. Meanwhile, the lake is almost dried out (Jörg Freyhof, pers. comm, 2018).

The ichthyofauna of Lake Urmia basin was reviewed by Ghasemi et al. (2015) and they listed 29 fish species, five of which are endemic to the lake basin. These are; *Acanthobrama urmianus* (Günther, 1899), *Alburnoides petrubanarescui* (Bogutskaya and Coad, 2009), *Alburnus atropatenae* (Berg, 1925), *Petroleuciscus ulanus* (Günther, 1899) and *Romanogobio persus* (Günther, 1899). Recently, an additional endemic species (*Oxynoemacheilus elsae*) has been described from the Zarineh-Simineh, Sofi and Mahabad rivers draining to Lake Urmia (Eagderi et al., 2018). On the other hand, eleven exotic species inhabit the Lake basin: *Carassius auratus* (Linnaeus, 1758), *Carassius gibelio* (Bloch, 1782), *Ctenopharyngodon idella* (Valenciennes, 1844), *Cyprinus carpio* Linnaeus, 1758, *Hemiculter leucisculus* (Basilevsky, 1855), *Hypophthalmichthys molitrix*

(Valenciennes, 1844), *Pseudorasbora parva* (Temminck & Schlegel, 1846), *Oncorhynchus mykiss* (Walbaum, 1792), *Gambusia holbrooki* (Girard, 1859), *Sander lucioperca* (Linnaeus, 1758), *Rhinogobius similis* (Gill, 1859). There are thirteen permanent rivers and many small springs in Lake Urmia basin, all of them within the borders of Iran (Eimanifar and Mohebbi, 2007; Stevens et al., 2012) except one small stream, which has its upper parts in Turkey. This drainage of Lake Urmia (headwater of Nazli-chay River) originates from the Mor Mountain (about 25 km inside from the Esendere customs) which is located near Kısıklı village, Turkey. The second stream source from eastern Yüksekova drains to Nazli-chay River in Iran. The presence of these streams in Turkish boundaries had never been mentioned by the researchers who conducted taxonomic studies in the upper Great Zap River which is geographically very close to the area (Kaya et al., 2016; Kelle, 1978; Kuru, 1975). Ghasemi et al. (2015) recognized four species in Nazli-chay River: *Alburnus atropatenae*, *Capoeta capoeta*, *Barbus cyri* and *Oxynoemacheilus brandtii*. Here, I have attempted to determine the fish species inhabit this stream, because of the possibility to occurrences of potential native fish records for Turkish freshwaters.

## MATERIALS AND METHODS

This survey was conducted on streams Esendere (headwater of Nazli-chay River) and Onbaşılar (a drainage of Nazli-chay River). Esendere Stream is about 25km in Turkey. After leave the Turkish boundaries, it flows about 60 km to the east towards the Lake Urmia. Onbaşılar Stream source from 20 km east of Yüksekova and it is about 15 km Turkey.

Fish samples were caught with pulsed DC electro-fishing equipment at five sampling sites in September 2019 in Esendere and Onbaşılar streams, southeast of Anatolia

(Table 1; Figure 1). After anaesthesia using MS-222, the collected materials were fixed in 5% formaldehyde solution and transferred to the laboratory for morphological investigation. Bogutskaya and Coad (2009), Eagderi et al. (2018) and Khaefi et al. (2017) were followed to identify the fishes. The map (Figure 1) was created using the Qgis v. 2.6.1-Brighton software.

**Abbreviations:** SL: standard length; FFR: Zoology Museum of the Faculty of Fisheries, Recep Tayyip Erdogan University, Rize, Turkey.

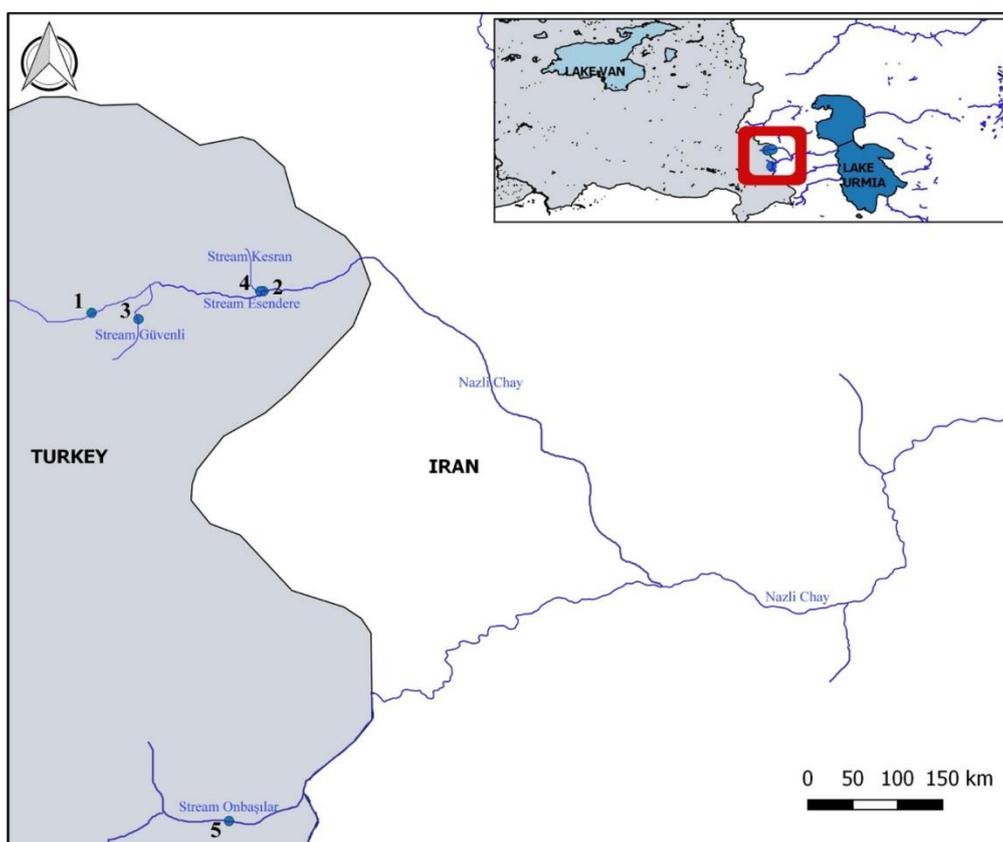


Figure 1. Sampling sites in the survey area

Table 1. Sampling sites in the area and the species obtained during the survey

Stream	Coordinates	Species
1 Esendere (upper part)	37.707891N 44.549040E	<i>Barbus cyri</i> , <i>Alburnoides petrubanarescui</i>
2 Esendere (lower part)	37.714213N 44.604656E	<i>Barbus cyri</i> , <i>Alburnoides petrubanarescui</i>
3 Güvenli	37.705966N 44.564413E	<i>Barbus cyri</i> , <i>Alburnoides petrubanarescui</i>
4 Kesran	37.714035N 44.603367E	<i>Oxynoemacheilus elsae</i>
5 Onbaşılar	37.544105N 44.593580E	<i>Alburnus atropatena</i> , <i>Barbus cyri</i> , <i>Alburnoides petrubanarescui</i>

## RESULTS

In the present study, four species were found in the Esendere and Onbaşilar streams. Three of them new record for fish fauna of Turkey (*Alburnoides petrubanarescui*, *Alburnus atropatena* and *Oxynoemacheilus elsae*). Fourth species is *Barbus cyri* which occurs also in Turkish Kura-Aras drainages (Kaya et al. 2020).

***Alburnoides petrubanarescui* Bogutskaya & Coad, 2009 (Figure 2)**



Figure 2. *Alburnoides petrubanarescui*, FFR 7016, 73 mm SL, Esendere Stream

**Common name.** Urmia spirlin

**Type locality.** Qasemlou Chay, Urmia Lake basin

**Distribution.** The species is known from only in Lake Urmia basin. Here, the species was found in Esendere and Onbaşilar streams.

***Alburnus atropatena* Berg, 1925 (Figure 3)**



Figure 3. *Alburnus atropatena*, FFR 8814, 125 mm SL, Onbaşilar Stream

**Common name.** Urmia bleak

**Type locality.** Qasemlou Chay, Urmia Lake basin

**Distribution.** The species is known from only in Lake Urmia basin. Here, the species was found in Onbaşilar Stream.

***Oxynoemacheilus elsae* Eagderi, Jalili & Çiçek, 2018 (Figure 4)**



Figure 4. *Oxynoemacheilus elsae*, FFR 15536, 53 mm SL, Kesran Stream

**Common names.** Urmia loach

**Type locality.** Zarineh River, near Shahin-Dej city, Urmia Lake basin

**Distribution.** *Oxynoemacheilus elsae* described from Zarineh-Simineh, Sofi and Mahabad rivers drainages, Lake Urmia basin, Iran. Here, the species was found in Kesran Stream where is the draining to Esendere Stream (Figures 1 and 5).

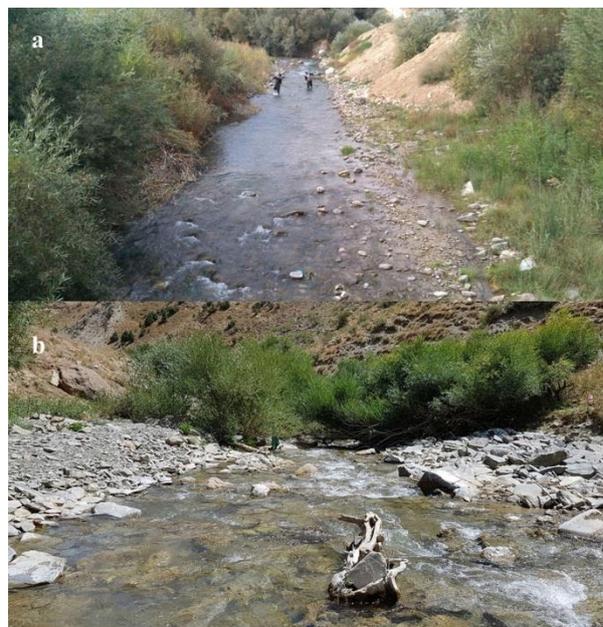


Figure 5. View of sampling sites; a, Esendere Stream; b, Onbaşilar Stream

## DISCUSSION

Before the visit the Esendere and Onbaşilar streams I had expected to found more fish species in the area. Despite the intensive sampling of the appropriate habitats of the *Oxynoemacheilus elsae*, only one individual of the species was found. In Esendere Stream, which has a generally shallow and fast flowing structure, no *Alburnus atropatena* was found. In Onbaşilar Stream, six adult samples of the species was found where the stream is deeper and flowing slower. Many *B. cyri* and *A. petrubanarescui* juveniles were observed in both Esendere and Onbaşilar drainages. Adult specimens of both species were found in Onbaşilar Stream. Probably, Esendere Stream mostly is preferring for spawning for both *B. cyri* and *A. petrubanarescui*. On the other hand, it was not found other species such as *Capoeta capoeta* and *Oxynoemacheilus bergianus* both of which are very widespread in the Lake Urmia drainages in Iran.

*A. petrubanarescui*, *A. atropatena* and *O. elsae* were listed in Endemic fishes of Iran (Eagderi et al., 2018). This study provided an evidence the presence of these three species in Turkey. In this case, these species should be excluded from endemic fishes of Iran. None of these species have not been yet evaluated against IUCN criteria, therefore

their current statuses are "Not Evaluated". I strongly recommend that the conservation status of endemic fish species of Urmia Basin should be assessed against IUCN criteria. Because, day by day the problems growing and the lake is going to die. Fortunately, neither during the survey in this study nor by Ghasemi et al. (2015) any exotic species were found in Nazli-chay River and its drainages. However, as mentioned above, eleven exotic species inhabit the Lake basin. Some species among these, such as *Carassius gibelio* and *Pseudorasbora parva*, have a high invasiveness potential and threat on native species. Therefore, all endemic fishes of Lake Urmia seem in threat.

The type specimens of *Alburnoides petrubanarescui* collected by V.D. Vladykov in 1962 from Qasemlou Chay (37°21'N, 45°09'E), Urmia basin (Bogutskaya and Coad, 2009). The species has not been found again after it was described by Bogutskaya and Coad (2009), despite its type locality and other drainages of the Lake Urmia have been searched several times. Even Iranian researchers speculate that may the species have never been there and it was described by the materials mislabelled (Jörg Freyhof, pers. comm., 2019). Recently, Jouladeh-Roudbar et al. (2020) have confirmed that the species cannot be found in the area even though extensive effort sampling the type locality and adjacent area by many researchers. Even, they emphasised the species possibly extinct and encouraged further surveys in the area. Fortunately, with the results of this study, the presence of the species in Lake Urmia basin has been confirmed. The threats on *A. petrubanarescui* populations

seem greater. Populations of *A. petrubanarescui* may be restricted with Turkish part, and probably it is absent or very restricted in Iranian part.

Recently, a new barbel, *Barbus urmianus*, has been described in Mahabad-Chai River (36°29'55.14"N 45°33'54.26"E) a southern drainage of Lake Urmia (Eagderi et al., 2019). The *Barbus* specimens collected in Esendere and Onbaşilar streams in this study, morphologically identical with *B. cyri*. Therefore, these barbel population were acknowledged as *B. cyri*.

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