

The Fish Fauna of Eşen Stream (Fethiye-Muğla)

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Abstract: This study was conducted in order to identify fish fauna in Eşen Stream. Samples were collected between October 2002 and September 2003. A total of 10 species (*Anguilla anguilla*, *Leuciscus cephalus*, *Petroleuciscus borysthenicus*, *Blennius fluviatilis*, *Mugil cephalus*, *Oedalechilus labeo*, *Mugil ramado*, *Liza saliens*, *Carassius carassius* and *Atherina boyeri*) and 3 subspecies (*Salmo trutta macrostigma*, *Barbus plebejus escherichi* and *Capoeta capoeta bergamae*) belong to 6 families (*Anguillidae*, *Salmonidae*, *Cyprinidae*, *Mugilidae*, *Atherinidae* and *Blennidae*) were identified. The results revealed that *Petroleuciscus borysthenicus*, *Mugil cephalus*, *Oedalechilus labeo*, *Mugil ramada* *Liza saliens*, *Carassius carassius*, *Atherina boyeri*, *Salmo trutta macrostigma*, *Barbus plebejus escherichi* and *Capoeta capoeta bergamae* are new records for Eşen Stream.

Keywords: Fish fauna, Taxonomy, Eşen Stream.

Eşen Çayı Balık Faunası (Fethiye-Muğla)

Özet: Bu çalışma Eşen Çayı'nın balık faunasını belirlemek amacıyla yapılmıştır. Örnekler 2002 Ekim ve 2003 Eylül ayları arasında toplanmıştır. Altı familyaya ait (*Anguillidae*, *Salmonidae*, *Cyprinidae*, *Mugilidae*, *Atherinidae* and *Blennidae*), 10 tür (*Anguilla anguilla*, *Leuciscus cephalus*, *Petroleuciscus borysthenicus*, *Blennius fluviatilis*, *Mugil cephalus*, *Oedalechilus labeo*, *Mugil ramado*, *Liza saliens*, *Carassius carassius* and *Atherina boyeri*) ve 3 alt tür (*Salmo trutta macrostigma*, *Barbus plebejus escherichi* and *Capoeta capoeta bergamae*) belirlenmiştir. Bunlardan *Petroleuciscus borysthenicus*, *Mugil cephalus*, *Oedalechilus labeo*, *Mugil ramada*, *Liza saliens*, *Carassius carassius*, *Atherina boyeri*, *Salmo trutta macrostigma*, *Barbus plebejus escherichi* and *Capoeta capoeta bergamae* araştırma alanında yeni kayıt olarak ifade edilmiştir.

Anahtar Kelimeler: Balık faunası, Taksonomi, Eşen Çayı.

1. Introduction

Although there are many studies that have been carried out by several researchers on the fish fauna of freshwater of Turkey, few of them are relevant to the freshwater fish in Western Anatolia. The earliest studies on the fauna of freshwater fish of Turkey belong to Abbott [1], who is known to have conducted the first studies on this subject [2].

From 1940s on, researchers from Turkey launched systematic and ecological studies on the freshwater fish with great enthusiasm [3, 4]. In order to meet the lack of knowledge on the freshwater fish fauna of Turkey and to determine their nation-wide distribution areas, there have been many detailed studies done in the period after the 1970s. Some of them have performed on the freshwater fish of Turkey and conducted many faunistic and ecological characters

including taxonomic and ecological features of freshwater fish in Western Anatolia [5-14].

The other studies in Freshwater Fish in Anatolia involve a systematic and zoogeographic analyses of inland water fish of Southern Anatolia, a study into taxonomic revision of inland water fish of Trakya Region, a systematic and zoogeographic research on the inland water fish of Mediterranean Region of Turkey [8, 15, 16].

As it's seen, the studies have been focused on the analyzing methods and collecting data related growth, breeding and some other biological characteristics of fish rather than faunistic ones. Therefore, it is believed that the present study will be a reliable source for the systematical studies of up-to-date conditions and geographical distribution of the freshwater fishes in Western Anatolia, and it will be a new model for the faunistic studies.

2. Materials and Methods

The Eşen (Kocaçay) Stream, which has been chosen as the research area, is an important source of freshwater with high volume of flow and about 100 km in length. The Eşen Stream originates from Fethiye-Seki, Muğla, flowing into the Mediterranean Sea in The Kalkan area after joining with the stream the coming out of Saklıkent Canyon, which is touristically and ecologically important. The 18 km long Patara Beach, which is the one of the major breeding areas for turtles *Caretta caretta*, is located where the river joins the sea.

This study was carried out between October 2002 and September 2003 (Figure1). In total,

527 individuals from different sampling stations were caught by electro shock and other fishing equipments. The locations of the stations are shown in Figure 1. The samples were collected monthly or bi-monthly periods, depending on the weather conditions. The ecological factors and their impact in the river especially on the fish fauna were also observed. Fish samples were fixed in 4 % formaldehyde and transferred to the laboratory for processing. Metric and meristic characteristics of fish were determined and then samples were stored in 70 % alcohol. The samples were then analysed in Muğla University, Biology Department, Hydrobiology Research Laboratory. In order to determination of fish species several literatures were used [2,17-20].

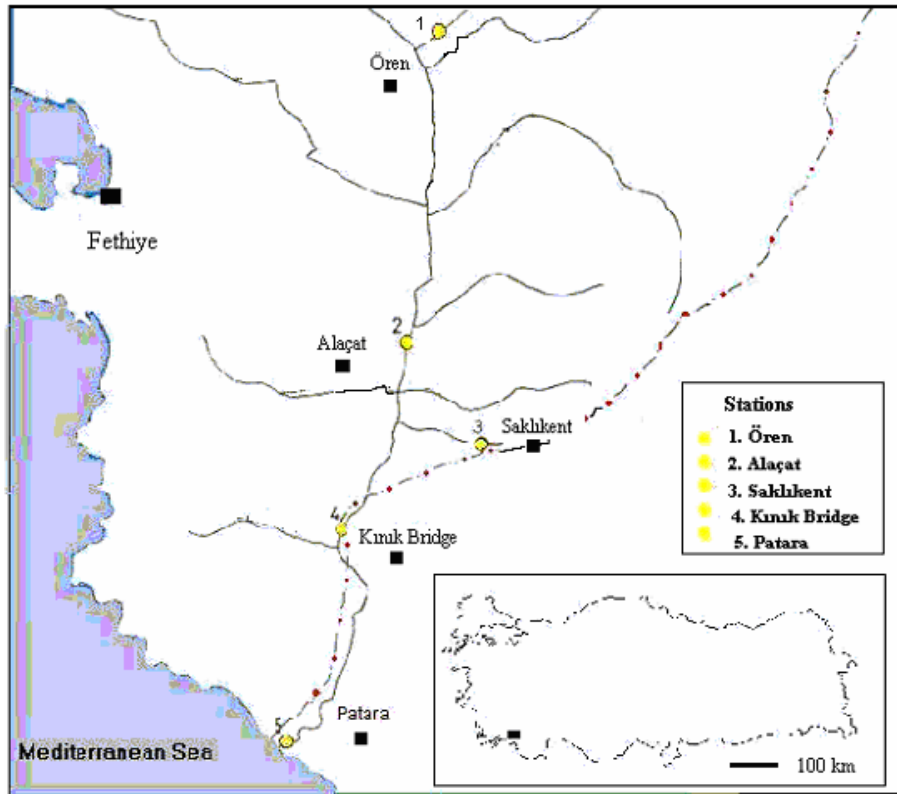


Figure 1 Sampling stations in Eşen Stream.

3. Results

Information about fish fauna in The Eşen Stream, Turkish and Latin names of the fish diagnostic features and distribution of them in

the research area (Table 1) is provided by the present study. Species are ordered by numbering regardless of their systematic order. After diagnostic studies thirteen species belonging to 6 families were determined.

Table 1. The distribution of the fish species and subspecies at the stations in Eşen Stream.

Fishes/Stations	Ören	Alaçat	Saklıkent	Kımık	Patara
<i>Anguilla anguilla</i>	+				+
<i>Salmo trutta macrostigma</i>	+				
<i>Blennius fluviatilis</i>		+		+	+
<i>Carassius carassius</i>					+
<i>Leuciscus cephalus</i>	+	+	+	+	+
<i>Petroleuciscus borysthenicus</i>	+	+	+	+	
<i>Capoeta capoeta bergamae</i>		+			
<i>Barbus plebejus escherichi</i>	+	+		+	
<i>Atherina boyeri</i>					+
<i>Mugil cephalus</i>				+	+
<i>Liza saliens</i>				+	+
<i>Mugil ramada</i>					+
<i>Oedalechilus labeo</i>					+

Family: ANGUILLIDAE

Species *Anguilla anguilla* (LINNAEUS, 1758)

First site of discovery (Terra Typica): Europe

Turkish and Local name: Yılan balığı

Diagnostic: According to Ladiges and Vogt [18] D: 245-280. A:191-235. According to Balık [15], D:225-270, A: 180-245, P:16-20. According to Müller [19], D:245-280, A:205-235, P:15-20. According to Geldiay and Balık [2], D: 243-270, A: 175-248, C:8-12.

According to the 33 samples analysed, diagnostic: D:243-270, A: 175-248, C: 8-12.

Family: SALMONIDAE

Subspecies *Salmo trutta macrostigma* (DUMERIL, 1855)

First site of discovery (Terra typica): Algeria

Turkish and Local name: Dağ alabalığı, Büyük lekeli alabalık

Diagnostic characteristics: According to Geldiay and Balık [2], D: III- V 10-11 A: III-IV 8-10 L.lat:110-118. According to 23 samples analysed, D:III-10 A:III-9 L.lat 110-114.

Family: BLENNIDAE

Species *Blennius fluviatilis* (ASSO, 1801)

First site of discovery (Terra typica): East and Southern Spain

Turkish and Local name: Horozbina balığı

Diagnostic: According to Geldiay and Balık [2], D: XII-XIII A: 18-20, P: 13-14 V:3-4, C:12-14; According to the 42 samples analysed: D:XII-XIII A:18-19 P: 13-14 V:3-4.

Family: CYPRINIDAE

Species *Carassius carassius* (LINNAEUS, 1758)

First site of discovery (Terra Typica): Europe

Turkish and Local name: Havuz balığı

Diagnostic: According to Geldiay and Balık [2], D:III-IV 14-22, A: II-III 5-7, P:I 12-15, V:II 7-8, L.lat: 29-36. Pharynx teeth: 4-4; According to the 73 samples analysed: D:III 17-18, A:II 6-7; P: I 14-15, V:II 7-8 L.lat: 29-31.

Species ***Leuciscus cephalus* (LINNAEUS, 1758)**

First site of discovery (Terra typica): Europe

Turkish and Local name: Tatlı su kefalı

Diagnostic: According to Balık [15], D:III 8-9, A:III 7, L.Lat: 42-46, Pharynx teeth: 2.5-5.2. According to Müller [19], D: III 8-9, A: III 7-9, L.Lat:44-46, Pharynx teeth: 2.5-5.2. According to Balık [21], D: II-III 8, A: II-III 7-8 L.Lat: 39-46. According to Balık [2], D:III 8, A: III 8-9, L.Lat: 43-47, Pharynx teeth: 2.5-5.2.

According to 122 samples analysed: D:III 8, A: 8-9 L.Lat: 42-46, Pharynx teeth:2.5-5.2.

Species ***Petroleuciscus borysthenicus* (KESSLER, 1859)**

First site of discovery (Terra Typica): Dinyeper River

Turkish and Local name: Tatlı su kefalı

Diagnostic: According to Balık [2], D: III 8-9, A: III 9-10 L.Lat: 32-40, Pharynx teeth:2.5-5.2;

According to 96 samples analysed: D:III 8,A:III 8-9 L.Lat:35-40, Pharynx teeth: 2.5-5.2.

Subspecies ***Capoeta capoeta bergamae* KARAMAN, 1971**

First site of discovery (Terra typica): Bergama (İzmir)

Turkish and Local name: Sarı balık, İn balığı, Siraz balığı

Diagnostic: According to Balık [15], D: III 8, A:III 5, L.Lat:60-68. According to Balık [21], D:III 7-8, A: III 5, L.Lat: 55-63. The number of gill thorn: 16-19.

According to 2 samples analysed: D: III 8, A: III 5, L.lat: 60-68, Pharynx teeth:2.3. 5-5-3.2 or 2.3. 4-4.3.2, number of gill thorn, 17-20.

Subspecies ***Barbus plebejus escherichi* STEINDACHNER, 1897**

First site of discovery (Terra typica): Porsuk Stream (Eskişehir)

Turkish and Local name: Bıyıklı balık

Diagnostic: According to Balık [15], D: III 8, A: III 5, L.lat:56-64, Pharynx teeth:2.3.5-5.3.2 or 2.3.5-4.3.2, number of gill spine: 8-12. According to Geldiay and Balık [2], D:III-IV 7-8, A: III 5, L.lat: 53-63, number of gill spine: 8-13.

According to 3 samples analysed: D: III 8, A:III 5, L.lat:56-63, number of gill thorn: 7-10.

Family: ATHERINIDAE

Species ***Atherina (Hepsetia) boyeri* RISSO, 1810**

First site of discovery (Terra typica): Nice

Turkish and Local name: Gümüş balığı

Diagnostic: According to Geldiay and Balık [2], D 1: VI-VIII, D 2: I + 9-15, A: I +12-18, L 1: 39-49; According to 5 samples analysed: D1:VII, D2:II 9-12, A:II 11-13, P: II 13-14, L1: 39-45.

Family: MUGILIDAE

Species ***Mugil cephalus* LINNAEUS, 1758**

First site of discovery (Terra typica): The coasts of Atlantic and Europe

Turkish and Local name: Has kefal balığı

Diagnostic: According to Geldiay and Balık [2], D1: IV, D2: I 8-9,A:III 8-9, P:17 V:15. According to 18 samples analysed: D1: IV, D2: I+8.

Species ***Liza saliens* (RISSO,1810).**

First site of discovery (Terra typica) : Nice

Turkish and Local name: İlyaya balığı, Kefal balığı

Diagnostic: According to Geldiay and Balık [2], D1: IV, D2: I 8-9, A: III 7-9, P: 16-17, V: I 5.

According to 51 samples analysed; D1: IV, D2: I+8.

Species ***Mugil ramada* (RISSO,1826)**

First site of discovery (Terra typica): Mediterranean coasts

Turkish and Local name: Pulatarina balığı, Kefal balığı

Diagnostic: According to Geldiay and Balık [2], D1: IV, D2:I 7-8, A:III 8-9, P:17, V:I-V.

According to 9 samples analysed: D1: IV, D2: I+8.

Species ***Oedalechilus labeo* (CUVIER,1829)**

First site of discovery (Terra typica): Mediterranean

Turkish and Local name: Dudaklı kefal balığı

Diagnostic Characteristic: According to Geldiay and Balık [2], D1:IV, D2:I 8-9, A:III 9-10, P:17, V:I 5. According to 50 samples analysed: D1: IV, D2: I+9.

4. Discussion

Salmo trutta macrostigma, which were caught at Ören Station, was first reported from the study area. It is thought that it has a North origin and it migrated to Mediterranean countries and Anatolian inland water during glacial period [2]. According to the reports of Geldiay [22] and observations at habitats, it is noticed that trouts are killed by using dynamite, high voltage, lime, fishing line, pesticides and projectors during the nights. Use of destructive means affects offspring, young and adult members in the population. Overfishing especially affects the egg laying females which go to the parts of rivers with shallow water and threatens their breeding potentials. For this reason, fishing trouts in breeding periods is forbidden. The population of *Salmo trutta macrostigma* in the rivers are also affected by the dams built on the rivers. Erdemli and Kalkan [23] reported that Medik Dam on Tohma Stream affect *Salmo trutta macrostigma* and other species. Population is endangered as the dams do not allow any passage to fish during their migration as they separate the populations. This threatens the ecological condition and the trouts more than other species. The trout population has also been influenced by using water for irrigation purpose and changing the river beds. *Blennius fluviatilis* in the research area was also reported [8], from the rivers flowing into Mediterranean. The data on this subspecies reported by former studies support the diagnostic and morphometric characteristics obtained by this study. This subspecies was caught at Alaçat, Kınık and Patara Stations (Table 1).

Leuciscus cephalus was also reported [8], from The Eşen Stream, Fethiye during this study. This species was caught at Ören, Alaçat, Saklıkent, Kınık and Patara Stations (Table 1).

There is no protection measure suggested for this highly populated species. *Petroleuciscus borysthnicus* was caught at Ören, Alaçat, Saklıkent, Kınık Stations (Table 1). This species is differentiated from *Leuciscus cephalus* with its reduced ligne lateral [24]. Up to now, there has been no record, reporting that this species lives in The Eşen Stream. The samples of *Capoeta capoeta bergamae* caught in the research area were analysed in details. South-Western Anatolia, which is known as the distribution area of this species extends as far as Kocaçay (Fethiye) [25]. This species is caught only at Alaçat Station (Table 1).

The *Barbus plebejus escherichi* subspecies was caught at Ören, Alaçat and Kınık Stations (Table 1). The other species of Cyprinidae was *Carassius carassius*. This species was caught from Patara Station. The only species belonging to Atherinidae in the research area was *Atherina boyeri*. This species was reported from Mediterranean Coasts [17]. *Atherina boyeri* was caught at Patara Station. The species of Mugiliade *Mugil ramada*, *Oedalechilus labeo*, *Liza saliens* and *Mugil cephalus* which identified in this study, were also reported [17] in Mediterranean Coasts. *Mugil ramado* and *Oedalechilus labeo* were caught at Patara Station and *Liza saliens* and *Mugil cephalus* were caught at Kınık and Patara Stations where the stream joins sea water. In this study, 10 species (*Anguilla anguilla*, *Carassius carassius*, *Petroleuciscus borysthnicus*, *Leuciscus cephalus*, *Mugil cephalus*, *Mugil ramada*, *Liza saliens*, *Oedalechilus labeo*, *Atherina boyeri*, and *Blennius fluviatilis*) 3 subspecies (*Salmo trutta macrostigma*, *Barbus plebejus escherichi* and *Capoeta capoeta bergamae*) belonging to 6 families (*Anguillidae*, *Blennidae*, *Mugilidae*, *Atherinidae*, *Cyprinidae* and *Salmonidae*). In

this study, *Petroleuciscus borysthenicus*, *Mugil cephalus*, *Oedalechilus labeo*, *Mugil ramada*, *Liza saliens*, *Carassius carassius*, *Atherina boyeri*, *Salmo trutta macrostigma*, *Barbus plebejus escherichi* and *Capoeta capoeta bergamae* have been firstly reported from the study area.

In conclusion, The Eşen Stream houses very rich fresh water fish fauna with various physico-chemical and ecological features, which

increases the importance of Eşen Stream. Eşen Stream has one Hydro-Electric Plants on it and water of the stream could be used irrigation. Especially during summer period when the water level is low in some areas and removing sand for some reason from the stream bed has adverse affects on the fish fauna and the ecosystem.

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