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ARAŞTIRMA MAKALESİ **RESEARCH PAPER**

The Current Fish Fauna of Hopa Stream (Artvin, Turkey)

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Abstract: In the present study, the actual fish fauna of Hopa Stream was re-examined. The distribution and latest taxonomic status of the species were assessed. Overall, 3 sampling sites were investigated between 2005–2019 to reveal the inventory of fish species in the area. In total, 11 species were recognized. As a result of this study, one species of *Gasterosteus aculeatus*, which could not be detected in previous studies, were recorded for the first time. As a result, no significant differences were detected in the ecological balance of Hopa Stream in terms of fish fauna, since there is no loss of biodiversity from the previously reported species.

Keywords: Fish fauna, Hopa Stream, systematics, freshwater fish.

Hopa Çayı'nın Güncel Balık Faunası (Artvin, Türkiye)

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Öz: Bu çalışmada, Hopa Çayının balık faunası yeniden incelenmiştir. Türlerin dağılımı ve son taksonomik durumları değerlendirilmiştir. Genel olarak, 2005-2019 yılları arasında bu akarsudaki balık türlerinin envanterinin çıkarılması için 3 örnekleme sahası öngörülmüş ve toplam 11 tür tespit edilmiştir. Yapılan bu çalışma sonucunda daha önceki çalışmalarda tespit edilemeyen *Gasterosteus aculeatus* türü ilk kez kaydedilmiştir. Daha önce belirlenen türlerden herhangi bir kaybın söz konusu olmaması sebebiyle Hopa Çayı'nın ekolojik dengesinde balık faunası açısından önemli değişiklik olmadığı söylenebilir.

Anahtar kelimeler: Balık faunası, Hopa Çayı, sistematik, tatlısu balıkları.

INTRODUCTION

Abbolt, (1835) mentioned the existence of trout (Salmonidae) in fresh waters of Trabzon and Erzurum regions. Berg (1949), published a three-volume publications on fish living in the freshwater of Russia and neighboring countries. In his study, particular attention has been given to determine some freshwater fish species living in the streams and rivers of Black Sea region of Turkey. Slastenonko, (1955-1956) published a book containing both sea and freshwater fish living in the Black Sea Basin. In this book, it is mentioned that some fish species live in the streams and rivers in Trabzon, and Çoruh River. Aras (1974), conducted research on the biological

and ecological characteristics of trout (Salmonidae) living in Çoruh and Aras Rivers. Kuru, (1975) reported 39 fish species and 29 subspecies belonging to 13 families as a result of systematic and zoogeographic examination of fish living in freshwater in the Tigris-Euphrates, Kura-Aras, Lake Van and the Central and Eastern Black Sea regions. Kutrup, (1994) investigated the fish living in freshwaters of Trabzon in terms of taxonomic and ecological aspects. Turan, (2003) studied freshwater fish in Rize and Artvin regions in terms of taxonomic and ecological properties. Turan et al., (2005) reported 7 species and 2 subspecies belonging to 4 families from Hopa Stream. Freyhof et al., (2018) recorded *Cobitis satunini* from Hopa Stream. In this study, the current status of extant fish species in Hopa Stream has been discussed.

MATERIAL AND METHOD

The study area comprises the Hopa Stream. The Hopa Stream is about 30 km length and originate from Cankurtaran mountain. Overall, 3 sampling sites (upper, middle and lower), were detected to reveal fishes in the area. No environmental problems were observed in this stream during fish sampling (define the sampling period e.g. between 2018 and 2019). The physico-chemical properties of water of Hopa Stream are as follows as temperature 16.4 ºC; pH 7.5; electrical conductivity 138.8 µS/cm; dissolved oxygen 10.0 mg/L, suspended material 18.3 mg/L; nitrite 0.16 mg/L; nitrate 0.4 mg/L; sulfate 7.33 mg/L and orto-phosphate 0.7 mg/L (Mutlu, 2019). Fishes were caught between 2004–2018 by Samus 1000 pulsed DC electro-fishing equipment, cast nets and gillnets from 3 sampling sites. After anesthesia, fish specimens were fixed in 4% formaldehyde and transferred to the laboratory for further identification. Formalin-fixed specimens were deposited at FFR (Recep Tayyip Erdogan University Zoology Museum of the Faculty of Fisheries, Rize). We followed by Baycelebi et al., (2015, 2017) to identify species. Common and local names of the species originate from FishBase (Froese and Pauly, 2019).

RESULTS

Overall, 11 fish species (Table 1) belonging to seven families were recognized. The most species-rich family in the area is Leuciscidae (4 species), followed by Mugilidae (2), Salmonidae (1), Cyprinidae (1), Cobitidae (1), Gobiidae (1) and Gasteriostedae (1)**.**

Family: Salmonidae

Salmo rizeensis Turan, Kottelat & Engin, 2010 (Figure 1)

Type locality: Çoruh River

Turkish name: Dağ alası

English name: Mountain trout

Distributed area: Upper part of Hopa Stream.

Figure 1. Mountain trout (*Salmo rizeensis*)

Family: Cyprinidae

Barbus tauricus (Steindachner, 1897) (Fig. 2)

Type locality: Kırım

Turkish name: Bıyıklı balık

English name: Crimean barbel

Distributed area: Middle part of Hopa Stream

Figure 2. Crimean barbel (*Barbus tauricus*)

Family: Leuciscidae

Alburnoides fasciatus (Nordman, 1840) (Fig. 3)

Type locality: Steams of Eastern Black Sea region

Turkish name: Noktalı inci balığı

English name: Spirlin

Distributed area: Middle part of Hopa Stream

Figure 3. Spirlin (*Alburnoides fasciatus*)

Alburnus derjugini Berg, 1923 (Fig. 4)

Type locality: Batumi (Georgia)

Turkish name: İnci balığı

English name: Georgian shemaya

Distributed area: Middle part of Hopa Stream

Figure 4. Georgian shemaya (*Alburnus derjugini*)

Rutilus frisii (Nordmann, 1840) (Fig. 5)
Type locality: Volga River (Russia)
Turkish name: Kutum, Levkit balığı
English name: Black Sea roach
Distributed area: Lower part of Hopa Stream

Figure 5. Blacksea roach (*Rutilus frisii*).

Squalius cf *seyhanensis* (Fig. 6)
Turkish name: Tatlısu kefali
English name: Chub
Distributed area: Lower and middle part of Hopa Stream.

Figure 6. Chub (*Squalius* cf *seyhanensis*)

Family: Cobitidae
Cobitis satunini Glabkov, 1935 (Fig. 7)
Type locality: Small streams draining into Black Sea
Turkish name: Taşyiyen balık
English name: Splendid spined loach
Distributed area: Lower part of Hopa Stream

Figure 7. Splendid spined loach (*Cobitis satunini*)

Family Mugilidae
Mugil cephalus Linnaeus, 1758 (Fig. 8)
Type locality: European Sea
Turkish name: Avrita balığı, has kefal,, topan balığı, topbaş balığı
English name: Flathead grey mullet
Distributed area: Lower part of Hopa Stream

Figure 8. Flathead grey mullet (Flathead grey mullet).

Chelon aurata (Risso, 1810) (Fig.9)
Type locality: Nice (France)
Turkish name: Altınbaş kefal balığı
English name: Golden grey mullet
Distributed area: Lower part of Hopa Stream

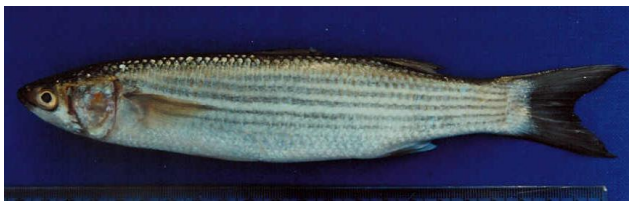

Figure 9. Golden grey mullet (*Chelon aurata*)

Family Gobiidae
Ponticola constructor (Nordmann, 1840) (Fig. 10)
Type locality: Çoruh River
Turkish name: Kaya balığı
English name: *Caucasian goby*
Distributed area: Lower part of Hopa Stream

Figure 10. Caucasian goby (*Ponticola constructor*).

Family: Gasteriostedae
Gasterosteus aculeatus Linnaeus, 1758 (Fig. 11)
Type locality: Europe
Turkish name: Dikence valığı
English name: Three-spined stickleback
Distributed area: Lower part of Hopa Stream

Figure 11. Three-spined stickleback (*Gasterosteus aculeatus*).

DISCUSSION

As a result of this study, 11 fish species currently distributes in Hopa Stream were identified. In previous study conducted by Turan, (2004), 7 species and 2 subspecies were recorded in the stream. Most of these species do not reflect current fish fauna. In this study, the current names of the species are given (Table 1). Additionally, *Gasterosteus aculeatus* have been recorded for the second time in the streams and river in eastern Turkish cost of Black Sea after the last thirty years. The freshwater chub species distributed in the Hopa stream is genetically similar to *Squalius seyhanensis*. Therefore, we identified it as *Squalius cf. seyhanensis*.

Table 1. Comparison of the results of this study with Turan et al., (2005).

Turan et al., (2005)	This study
Salmo trutta labrax	*Salmo rizeensis*
Neogobius kessleri	*Ponticola constructor*
Leuciscus cephalus	*Squalius* cf. *seyhanensis*
Alburnoides bipunctatus	*Alburnoides fasciatus*
Barbus tauricus escherichi	*Barbus tauricus*
Rutilus frisii	*Rutilus frisii*
Chalcalburnus chalcoides	*Alburnu derjugini*
Liza aurata	*Chelon auratus*
Mugil cephalus	*Mugil cephalus*
-	*Cobitis satunini*
-	*Gasterosteus aculeatus*

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