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Fish Fauna of the Karaabdal Stream (Samsun-Turkey)

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Abstract

This study was done for the aim of determining the fish species inhabiting in the Karaabdal stream. *Barbus tauricus* Kessler, 1877; *Capoeta tinca* (Heckel, 1843); *Squalius cephalus* (Linnaeus, 1758); *Vimba vimba* (Linnaeus, 1758); *Oxynoemacheilus eregliensis* (Banarescu and Nalbant, 1978) are identified as a result of evaluated specimens caught from the research area. Systematical characters of each taxon are explained and compared to data recorded with similar taxonomical studies. *Oxynoemacheilus eregliensis* which has conservation status in national and international lists is an endemic fish special to our land and it is designated from the research field.

Key words: the Karaabdal stream, fish, endemic, species.

Introduction

Turkey is located at the crossroads of Europe, Asia and Africa, ans is surrounded by sea from three sides with different ecological characters. Turkey has altitude diversity exceeding 5,000 meters from sea level and eventually has climate varieties. As a result of these features, Turkey becomes one of the important countries being in geography on account of biodiversity. Totally 236 fish species and subspecies belonging to 26 families inhabit in our inland waters (Kuru, 2004). The species of which distribution route passes over our land throughout geological periods, locate on suitable areas and form local populations in these places. Species jamming in certain small fields due to geographical restrictions isolate itself from other species by constituting its gene pond in time. We found a few studies related to the freshwater ichthyofauna in the province of Samsun (Ladiges, 1960; Kuru, 1972; 1975; Erk'akan and Akgül, 1986; Uğurlu and Polat, 2002; 2003; 2005; 2006; 2007a-c; 2008). The aforementioned researchers investigate fish species captured from known water sources of this area. This study is realized to identify the fish species living in the Karaabdal stream unsought for fishery before the present study, and to determine its systematic position as an addition to new findings with regard to geographical distribution in Anatolia.

Materials and Methods

The research area is located on the south of Samsun province and geographical co-ordinates are 36°00'-36°25' east longitudes, 40°50'-41°00' north latitudes. The Karaabdal Stream the source of which is on the slopes of Hacılar Mount is one of the tributaries of Yeşilırmak River. It has a lot of large and small branches as seen in Figure 1. The stream flows toward southeast and empties into Hasan Uğurlu Dam Lake.

The specimens examined in present study were captured beginning from May 2004 until June 2005 from different stations which can be represented. Features of stream were determined taking into consideration the ecological conditions. The fish were collected using electrofishing equipment and fishing lines.

Metric measurements were made by a dial caliper with 95% confidence limits and with a fish measurement scale. The following metric characteristics were measured: standard length (SL), body depth (BD), head length (HL), eye diameter (ED), interorbital distance (ID). All meristic characteristics were counted by lancet, pens and fish needle under a stereoscopic binocular microscope. The meristic characteristics, such as branched and unbranched rays in dorsal (D), ventral (V), anal (A) and pectoral (P) fins, lateral line scales (L.lat.), line transversal scales (L.tran.), body spots, gill rakers on the first arch, barbel numbers, row and number of pharyngeal teeth (PT) were examined.

For the genus and species identifications, the following sources were referred to: Berg (1964), Kuru (1980a), Kuru (1980b), Banarescu and Bogutskaya (2003), Banarescu and Nalbant (1964) and Stoumboudi *et al*. (2006).

Results

Five species belonging two families were identified from the Karaabdal Stream in 238 samples. Morphometric measurements and counts of fish

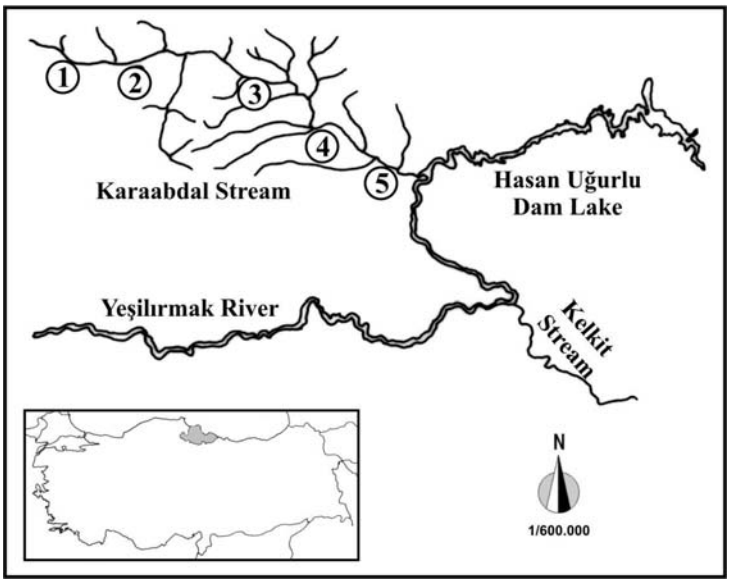

Figure 1. The map of the Karaabdal Stream and sampling stations.
1- Yumaklı 2- Karaabdal 3- Şeyhli 4- Kavaloğlu 5- Gökpınar

species caught from the stations are showed in Figure 1 and are given below according to the findings.

Family: Cyprinidae

***Barbus tauricus* Kessler, 1877**

Diagnostic characteristics: SL: 69-165 mm, SL/BD: 4.83–5.30, SL/HL: 3.69–3.94, HL/ED: 3.73–5.76, HL/ID: 2.97–4.26, ID/ED: 1.08–1.35, D: IV 8, V: II 8, A: III 5, P: I 14–16, L.lat.: 55–60, L.tran.: 13–15/9–10, PT: 2.3.5–5.3.2. Sampling stations and the number of specimens: Yumaklı (2), Karaabdal (1), Şeyhli (2).

***Capoeta tinca* (Heckel, 1843)**

Diagnostic characteristics: SL: 71-168 mm, SL/BD: 4.31–4.94, SL/HL: 4.12–4.78, HL/ED: 3.46–4.65, HL/ID: 2.42–2.90, ID/ED: 1.34–1.77, D: IV (7) 8 (9) , V: II (7) 8 (9) , A: III 5, P: I (14–16) 17–19 (20) , L.lat.: 69–86, L.tran.: (12) 13–16/9–13 (14), PT: 2.3.4–4.3.2. Sampling stations and the number of specimens: Yumaklı (14), Karaabdal (25), Şeyhli (18), Kavaloğlu (22), Gökpınar (14).

***Squalius cephalus* (Linnaeus, 1758)**

Diagnostic characteristics: SL: 75-185 mm, SL/BD: 4.48–4.94, SL/HL: 4.02–4.29, HL/ED: 3.19–4.32, HL/ID: 2.08–2.83, ID/ED: 1.11–1.72, D: III (7) 8, V: II (7) 8, A: III (7) 8 (9), P: I (14) 15–16 (17–18), L.lat.: (41–42) 43–44 (46), L.tran.: 7–8.5/3–4, PT: 2.5–5.2. Sampling stations and the number of specimens: Yumaklı (5), Karaabdal (4), Şeyhli (9), Kavaloğlu (8), Gökpınar (11).

***Vimba vimba* (Linnaeus, 1758)**

Diagnostic characteristics: SL: 102-122 mm, SL/BD: 3.68–4.02, SL/HL: 3.88–4.23, HL/ED: 3.01–3.16, HL/ID: 3.40–3.64, ID/ED: 1.07–1.13, D: III 8–9, V: II 9, A: III 17–18, P: I 14–17, L.lat.: 53–59, L.tran.: 9–10/5–6, PT: 5–5. Sampling stations and the number of specimens: Kavaloğlu (4), Gökpınar (3).

Family: Balitoridae

***Oxynoemacheilus eregliensis* (Banarescu & Nalbant 1978)**

Diagnostic characteristics: SL: 58-77 mm, SL/BD: 5.90–7.19, SL/HL: 4.39–4.94, HL/ED: 4.37–5.52, HL/ID: 3.70–5.14, ID/ED: 1.00–1.44, D: IV 8, V: II (6) 7 (8), A: III 5, P: I (9) 10 (11). Sampling stations and the number of specimens: Yumaklı (32), Karaabdal (45), Şeyhli (18).

Discussion

Morphologies of the fish inhabiting in the Karaabdal Stream have been examined in the present investigation. The results about metric and meristic characteristics have been discussed by comparing them with those obtained from previous studies.

The meristic characteristics of *B. tauricus* are similar to findings of Kuru (1975a), Solak (1978), Balık (1987), Özuluğ (1999), Sarı *et al*. (2006). However, lateral line is different from the data in the study of Özuluğ (1999). The body ratios of *B. tauricus* go with the results of Berg (1964), Balık (1979), Erdemli and Kalkan (1992), Özeren (1997). Nevertheless, SL/BD ratios are distinct from findings of Erdemli and Kalkan (1992). Minimum and maximum limits belonging to meristic characteristics of *C. tinca* are included into the data recorded by Erk'akan (1981), Uğurlu and Polat (2002), Özuluğ *et al*. (2005). The body ratios of *C. tinca* resemble the findings of Berg (1964), Kuru (1975b), Uğurlu and

Polat (2002).

The meristic characteristics of *S. cephalus* are similar to the findings given by Battalgil (1942), Kuru (1975a), Balık (1987), Uğurlu and Polat (2002), Sarı *et al*. (2006). The body ratios of *S. cephalus* are almost the same with the data given by Erdemli and Kalkan (1996), Turan *et al*. (2004), Ünver and Erk'akan (2005). However, according to Kuru (1975b), SL/BD ratios are measured smaller than the examined samples in this study. The meristic characteristics of *V. vimba* go with the results of Kuru (1975a), Özuluğ (1999), Sarı *et al*. (2006). SL/BD ratios in our specimens resemble the findings of Berg (1964), Kuru (1975b). Nevertheless, SL/BD ratios measured by Erk'akan (1981) are smaller than the evaluated samples. SL/HL ratios are different from Balık (1979). HL/ED ratios are calculated as smaller than those of Berg (1964). The metric and meristic characteristics of *O. eregliensis* are similar to the findings of Banarescu and Nalbant (1964).

Barbus tauricus escherichii occur along the coast of Black Sea according to Banarescu and Bogutskaya (2003). Samples caught from three stations in the research area were identified using different literatures and decided on the level of species.

The investigation field is poorer than the other inland water sources within the city of Samsun in terms of fish species and subspecies richness. One of the most important reasons behind the poverty of fish fauna of the stream is the ecological conditions. The research area is generally rainy except summer and the water flows rapidly and is turbid except months of summer. Though, there may be fish species and subspecies that could not be determine, even if various methods mentioned in materials and methods were used during fishing.

There are a lot of reasons of decrease in native stocks in freshwaters. Nevertheless, degradation of natural balance is a fundamental factor. It is known that environmental pollution, because of increasing population and developing technology, has lethal effect on fish, particularly under periods of spawning, fertilization and larva. It is no doubt that polluted waters negatively affect the distribution and availability of adult individuals. Balık (1995) has pointed to the increasing pressure of environmental pollution on fish populations principally endemic fish abundantly inhabiting in wealthy freshwater sources of our land, twelve years ago. Investigation relating to water quality of Karaabdal stream is absent.

Samples captured from Ereğli, Beyşehir Lake, the Bendimahi Stream, Cihanbeyli, Gerede Lake, Aksaray, Hazer Lake (Dereboğazı), Çavuşçu Lake, Sapanca Lake, İznik Lake were identified as *Noemacheilus angorae bureschi* by Banarescu and Nalbant (1964). Same specimens were reported to belong to a new subspecies which is described as *Orthrias angorea eregliensis* by Banarescu *et al*. (1978). *Noemacheilus angorae bureschi*, *Orthrias angorea eregliensis*, *Barbatula eregliensis* are synonyms of *Oxynoemacheilus eregliensis* (Stoumboudi *et al*., 2006).

O. eregliensis has been inhabiting in the Marmara, Mediterranean, Central Anatolian and Southeastern Anatolia regions according to map given by Banarescu *et al*. (1978). Erk'akan and Kuru have described two new subspecies belonging to Balitoridae (Erk'akan and Kuru, 1986a; Erk'akan and Kuru, 1986b). Samples of *O. eregliensis* collected from Hazer Lake by Kuru (06.05.1971) were used for the purpose of comparison in both of investigations. Distribution area of *O. eregliensis* is somewhat discontinuous with reference to map. *O. eregliensis* exist in the Kızılırmak basin (the Central Anatolian and the Central Black Sea Region) according to Kuru *et al*. (2001). *O. eregliensis* in consequence of present study is the first record from freshwater sources in the province of Samsun. The investigation field is present in geographical distribution recorded in previous research of *O. eregliensis* (Kuru *et al*., 2001). No economic importance is present because of its small size, but its presentation and protection is significant both for its future and endemicity.

O. eregliensis is threatened as Mediterranean endemic freshwater fish according to Smith and Darwall (2006) and classified as critically endangered by the IUCN Red List of Threatened Species. Although *C. tinca* which is an endemic fish special to our country, has not the conservation status of national and international lists. *B. tauricus*, *V. vimba* and *S. cephalus* neither are endemic species nor are in the IUCN Red List of Threatened Species.

Consequently, endemic species have the precedence according to conservation priorities (Smith and Darwall, 2006; Balık, 1995). Therefore, even if *O. eregliensis* is plenty in study area, aborigines must be consciously raised and introductive studies must concentrate.

References

Balık, S. 1979. Taxonomical and ecological investigations upon freshwater fishes of Western Anatolia, PhD. thesis, İzmir: Ege University, 67 pp. (in Turkish)

Balık. S. 1987. Fishing and fishes in Lake Manyas, T.C. Tarım Orman ve Köyişleri Bakanlığı, Orman Genel Müdürlüğü, 2. Bandırma Kuş Cenneti ve Kuş Gölü Sempozyumu, 4–5 Haziran 1987, Bandırma: 47–59. (in Turkish)

Balık, S. 1995. Freshwater Fish in Anatolia, Turkey. Biological Conservation, Elsevier Science Limited, 72: 213–223.

Banarescu, P. and Nalbant, T. 1964. Süsswasserfische der Türkei. 2. Teil: Cobitidae, Mitt. Hamburg. Zool. Mus. Inst. Band., 61: 159–201.

Banarescu, P., Nalbant, T. and Balık, S. 1978. Süsswassefische der Türkei, 11. Teil, Die Gattung Orthrias in der Türkei und in Südbulgarien (Pisces, Cobitidae, Noemacheilinae). Mitt. Hamb. Zool. Mus.

Inst. Band., 75: 255–266.

Banarescu, P.M. and Bogutskaya, N.G. 2003. The Freshwater Fishes of Europe. Cyprinidae 2. Part II: *Barbus*. The Freshwater Fishes of Europe, 454 pp.

Battalgil, F. 1942. Contribution a la connaissance des poissons des eaux douces de la Turquie. İstanbul Üniversitesi Fen Fakültesi Mecmuası, 7(4): 287–306.

Berg, L.S. 1964. Freshwater Fishes of the U.S.S.R. and Adjacent Countries, 4th ed., Academy of Sciences of the U.S.S.R. Zoological Institute, 504 pp. (Translated from Russian)

Erdemli, A.Ü. and Kalkan, E. 1992. Kozluk Çayı Balıklarının Taksonomik Yönden Araştırılması. XI. Ulusal Biyoloji Kongresi, 24–27 Haziran, Elazığ: 77–86. (in Turkish)

Erdemli, A.Ü. and Kalkan, E. 1996. A faunistic study on the fishes of Tohma Stream, Tr. J. of. Zoology, 20(153): 153–160. (in Turkish)

Erk'akan, F. 1981. Sakarya Havzası Balıklarının (Pisces) Sistematiği ve Biyo-Ekolojik İlişkileri Üzerine Araştırmalar PhD. thesis, Ankara: Hacettepe University. (in Turkish),

Erk'akan, F. and Kuru, M. 1986a. A New Noemacheilinae Loach Subspecies From Turkey (Osteichthyes-Cobitidae). Doğa Tr. J. Bio., 10(1): 106–109.

Erk'akan, F. and Kuru, M. 1986b. A new noemacheilinae loach subspecies from the Lake Van Basin, Turkey (Osteichthyes-Cobitidae). Doğa Tr. J. Bio., 10(2): 160–162.

Erk'akan, F., Nalbant, T.T. and Özeren, S. C. 2007. Seven new species of *Barbatula*, three new species of *Schistura* and a new species of *Seminemacheilus* (Ostariophysi: Balitoridae: Nemacheilinae) from Turkey. J. Fish. International, 2(1): 69–85.

Kuru, M. 1972. The fresh water fish in the Terme-Bafra region (Black Sea coast) İstanbul Üniversitesi Fen Fakültesi Mecmuası, 37(1–2): 109- 117.

Kuru, M. 1975a. Dicle-Fırat, Kura-Aras, Van Gölü ve Karadeniz Havzası Tatlısularında Yaşayan Balıkların (*Pisces*) Sistematik ve Zoocoğrafik Yönden İncelenmesi (in Turkish), Associated Prof. thesis, Erzurum: Atatürk University, 186 pp.

Kuru, M. 1975b. Fish fauna of the East Anatolia region (in Turkish), Atatürk Üniversitesi Yayınları No: 348, Fen Fakültesi Yayınları, Atatürk Üniversitesi Basımevi, Erzurum, 65 pp.

Kuru, M. 1980a. Catalogue of fresh water fishes in Turkey, Hacettepe Üniversitesi Fen Fakültesi Yayınları Yardımcı Ders Kitapları Dizisi, Seri: 12, Hacettepe Üniversitesi Fen Fakültesi Basımevi, Beytepe, 73 pp. (in Turkish)

Kuru, M. 1980b. Key to the inland water fishes of Turkey, Part II, III, Hacettepe Bulletin of Natural Sciences and Engineering, 9: 113–133.

Kuru, M., Balık, S., Ustaoğlu, M.R., Ünlü, E., Taşkavak, E., 2001. Türkiye'de Bulunan Sulak Alanların Ramsar Sözleşmesi Balık Kriterlerine Göre Değerlendirilmesi Raporu (in Turkish), T.C. Çevre Bakanlığı Çevre Koruma Genel Müdürlüğü, Ankara, 292 pp.

Kuru, M. 2004. Recent Systematic Status of Inland Water Fishes of Turkey Gazi Üniversitesi, Eğitim Fakültesi Dergisi, 24(3): 1–21. (in Turkish),

Özeren, S.C. 1997. Sakarya Havza'sının Ankara İli Sınırlarındaki Kollarının İhtiyofaunası ve Tatlısu Kefali (*Leuciscus cephalus* L., 1758)'nin Büyüme Özellikleri (in Turkish), MSc. Thesis. Ankara: Hacettepe University.

Özuluğ, M. 1999. A Taxonomic Study on the Fish in the Basin of Büyükçekmece Dam Lake. Tr. J. of Zoology, 23: 439–451.

Özuluğ, M., Altun, Ö. and Meriç, N. 2005. On the Fish Fauna of Lake İznik (Turkey). Tr. J. of Zoology, 29: 371–375.

Sarı, M.H., Balık, S., Ustaoğlu, M.R. and İlhan, A. 2006. Distribution and ecology of freshwater ichtyofauna of the Biga Peninsula, North-western Anatolia, Turkey. Turk. J. of Zoology, 30: 35–45.

Smith, K.G. and Darwall, W.R.T. 2006. The Status and Distribution of Freshwater Fish Endemic to the Mediterranean Basin. IUCN, Gland, Switzerland and Cambridge, 39 pp.

Solak, K. 1978. Three *Barbus* species (Cyprinidae) inhabiting the Çoruh and Aras Basin, Doğa Bilim Dergisi, 2 (3): 161–167. (in Turkish)

Stoumboudi, M.T., Kottelat, M. and Barbieri, R. 2006. The fishes of the inland waters of Lesbos Island, Greece. Ichthyol. Explor. Freshwaters, 17(2): 129–146.

Turan, D., Verep, B., Şahin, C. and İmamoğlu, H.O. 2004. Hopa Çayı'nda Yaşayan Balıklar Üzerine Bir Araştırma. Türk Sucul Yaşam Dergisi, 4: 96–99. (in Turkish)

Uğurlu, S. and Polat, N. 2002. An Investigation on Fish Fauna of the River Mert (Samsun). Turk. J. of Zoology, 26(1): 63–75.

Uğurlu, S. and Polat, N. 2003. An Investigation on Fish Fauna in Lake Simenit (Terme-Samsun), Science and Engineering J. of Fırat University, 15(4): 485–494.

Uğurlu, S. and Polat, N. 2005. The Fishes Inhabiting in Suat Uğurlu Dam Lake, Terice and Göksu Stream (Ayvacık-Samsun) (in Turkish), Süleyman Demirel University, J. of Eğirdir Fish. Faculty, 1 (2): 27–37.

Uğurlu, S. and Polat, N. 2006. Fish Fauna of the River Miliç (in Turkish), Ege University Faculty of Science, J. of Fisheries and Aquatic Sci., 23(3–4): 441–444.

Uğurlu, S. and Polat, N. 2007a. Fish fauna in the Taşkelik River (Alaçam-Samsun) (in Turkish), İstanbul University Faculty of Fisheries, Journal of Fisheries and Aquatic Sci., 20: 17–35.

Uğurlu, S. and Polat, N. 2007b. Exotic fish species inhabiting in freshwater sources within the province of Samsun, J. of Fisheries Sci., 1(3): 139–151. (in Turkish)

Uğurlu, S. and Polat, N. 2007c. Determination of the ichtyofauna in the Terme Stream (Terme-Samsun) Turkish J. of Aquatic Life, 5–8: 342–355. (in Turkish)

Uğurlu, S. and Polat, N. 2008. The fish species inhabiting in the Engiz Stream (Samsun-Turkey), International J. of Natural and Engineering Sci., 2(1): 97–99.

Ünver, B. and Erk'akan, F. 2005. A natural hybrid of *Leuciscus cephalus* (L.) and *Chalcalburnus chalcoides* (Güldenstädt) (Osteichthyes-Cyprinidae) from Lake Tödürge (Sivas, Turkey). The Fisheries Society of the British Isles, Journal of Fish Biology, 66: 899–910.