

An Investigation in Fish Fauna İkizcetepeler Dam Lake (Balıkesir), Turkey

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Abstract

This study was carried out to determine the fish species of the basin of İkizcetepeler Dam Lake in the year of 2000. A total of 156 specimens were caught by fish nets, scoop nets, and fishing lines. As a result, 11 fish species including 3 subspecies, belonging to 2 families (Cyprinidae and Cobitidae), were identified. This paper gives the diagnostic characteristics of these fishes. These characteristics were then compared with those in the previous studies.

Key words: Fish species, Systematics, İkizcetepeler Dam Lake

INTRODUCTION

Turkey is a very rich country in terms of its aquatic ecosystems and water sources owing to its geomorphological

located approximately fifteen km away from Balıkesir City (27° 56' 42" N, 39° 29' 32" E). It was created after a 47.0 m-high dam was constructed between 1986 and 1991 by DSI (State Water Systems Services) in order to supply the drinking water for the

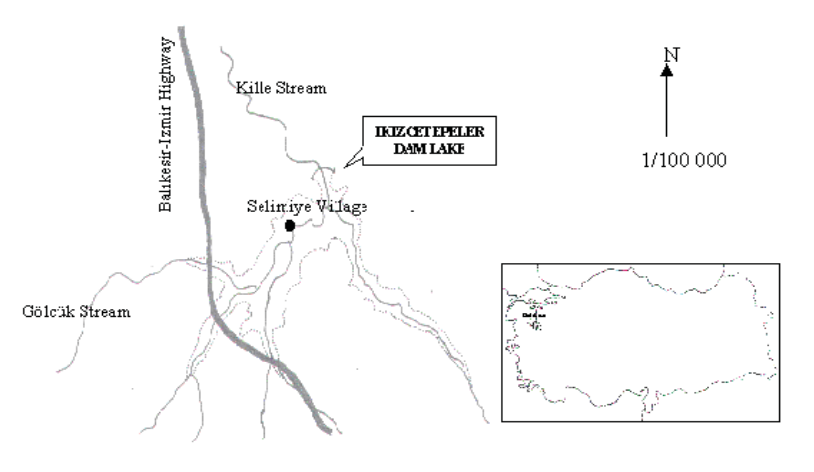


Figure 1. Map of the studying area (48)

structure. It is necessary to find out the biological richness, especially with regards fish faunae, to increase the utilisation of products obtained from inland water sources

While freshwater fish fauna studies in foreign countries, especially in Europe have been done (1-14), a lot of inland water fish fauna have been revealed in Turkey (15-47) uptill now.

The fish fauna of İkizcetepeler Dam Lake reservoir has not directly been studied except for the study related to the growth, reproduction and some other biological characteristics of the chub (*Leuciscus cephalus* L., 1758) (48). Therefore, especially commercial fish species inhabiting İkizcetepeler Dam Lake should be determined to so as to better resources for the future.

MATERIAL AND METHODS

The study material was sampled from İkizcetepeler Dam Lake in the year of 2000 (Fig. 1). The İkizcetepeler Dam Lake is

city of Balıkesir. The surface of the Reservoir of İkizcetepeler is 9.6 km², the overall volume totals 164 560 000 m³. The minimum code (water level above sea level) is 49.75 m and the maximum code is 175 m. According to the measurements taken in April 2000, the maximum depth was 47.0 m. The lake's largest water supply stream is Kille stream, which is connected to the other streams, namely, the Akcaköy, the Tasköy and the Kozludere. İkizcetepeler Dam Lake contains fish that serves a commercial fishery operated by the cooperatives (48).

The fish were caught with 8, 20, 24, 32 mm mesh-sized gill nets, trammel nets with and different mesh sizes and fishing line. The colours and features of patterns of fish samples were recorded and their photographs were taken. Then they were fixed and preserved in 4% formalin, Fin rays, lateral line scales and gill rakers, which are meristic characteristics necessary for determination of genus and subspecies of samples brought to laboratory, were counted under binocular microscope, Total

length (TL), standard length (SL), fork length (FL), head length (HL), and interorbital distance (IO) from metric characteristics were measured with a dial caliper of 0,05 m accuracy (1, 30, 49)

RESULTS

In the research area, a total of 11 species belonging to Osteichthyes were determined. Systematic categories are given according to the family order of classification of Nelson (50) and Geldiay and Balık (30, 49).

Phylum: Chordata

Subphylum Vertebrata

Class: Osteichthyes

Order: Cypriniformes

Family: Cyprinidae

Alburnoides bipunctatus Bloch, 1782- Spirlin

Local name: Noktalı inci balığı

Red List Category & Criteria: LR/Ic (51,52)

Material Size: 7.6-9.4 cm (FL).

According to characteristics of the 3 specimens; formula of fin rays is D: III, 8, A: III, 11-14, P: I, 14-16, V: II, 8. Lateral line scales 45-53. Transversal scales 8-10/5-6. The number of gill rakers on the first arch is 7 and 10.. Mouth is terminal. Barbels and well-developed lips are absent. Caudal fin deeply forked. Colour: Dorsal blue-green, lateral sides silvery-white.

Aspius aspius aspius Linnaeus, 1758-Asp

Local name: Kurt balığı, Koca ağız, Ak balık, Beyaz balık

Red List Category & Criteria: DD

Material Size: 16.5-22.0 cm (TL); 11.9-19.0 cm (SL).

According to characteristics of the 13 specimens; formula of fin rays is D: III, 8, A: III, 12-14. Lateral line scales 64-76. Transversal scales 11-14/5-6. Mouth is large in dorsal position.. Long shape body, laterally compressed with a long sharp head, caudal fin deeply forked. Colour: Dorsal green with silver to blue tints. lateral sides silvery-white. Silver white belly. Pectoral, pelvic and anal fins grey to Brown.

Cyprinus Carpio Linnaeus, 1758-carp

Local name: Sazan balığı

Red List Category & Criteria: DD

Material Size: 16.8-42.8 cm (FL)

According to characteristics of the 10 specimens; formula of fin rays is D: III,-IV, 18-21, A: III, 5-6, P: I, 15-16, V: II, 7 Lateral line scales 36-39. Transversal scales 6/6-7. Scales are large and thick. Mouth is terminal. Lips well developed and fleshy, two pairs of barbels on the upper jaw Colour: Dorsal silvery, lateral sides light-silvery, greyish belly. Pectoral, pelvic and anal fins grey to brown.

Cyprinus carpio carpio Linnaeus, 1758-Mirror Carp

Local name: Aynalı Sazan

Red List Category & Criteria: DD

Material Size: 13.3-26.5 cm (SL)

According to characteristics of the 9 specimens; formula of fin rays is D: III 17-19, A: II, 5-6, P: I 12-15, SL/BD: 2.76,

BD/HL: 1.07. Pharyngeal teeth are 1, 1, 3:3, 1,1, robust, molar-like with crown flattened or somewhat furrowed. Scales are large and thick. The cultivated form of this species, mirror carp, actually bears decreased number of scales compared to the wild carp, these are along the dorso-lateral line (under the dorsal fin base) on the caudal peduncle, pelvic, pectoral and anal fin bases and behind the operculum, the body high, the head small. Colour: Dorsal black, lateral sides brownish, and abdomen yellowish. The last unbranched rays of the dorsal and anal fins are ossified and the rear edges serrated.

Chalcarburnus calcoides (Güldenstaedti, 1772)-Danube bleak

Local name: Tatlı su kolyozu, Ak balık

Red List Category & Criteria: DD

Material Size: 13.1-20.0 cm (SL).

According to characteristics of the 47 specimens; formula of fin rays is D: II, 8-9, A: II, 12-14, P: I, 14-15, V: I, 8-9. Lateral line scales 57-69. Transversal scales 11-12/5-6. Pharyngeal teeth are in triserial 2.5-5.2. Gill rakers on the first arch 22-24. SL/BD: 3.96, BD/HL:1.13, HL/ED: 3.99. Colour: Dorsal dark grayish, lateral and ventral sides silvery-white, Fin colourness.

Capoeta tinca (Heckel, 1843) -Anatolian khramulya

Local name: Karabalık, Siraz balığı, İn balığı

Material Size: 15.5-16.2 cm (FL)

According to characteristics of the 9 specimens; formula of fin rays is D: III-IV,7-8, A: II-III,5, P: I, 18-19, V: I, 8. Lateral line scales 68-79. Transversal scales 14-15/19-20. Pharyngeal teeth are in triserial 2,3,4-4,3,2. Anal fin never reaches caudal peduncle. Colour: Dorsal brownish-dark brown, flanks and belly yellowish.

Tinca tinca (Linnaeus, 1758)-Tench

Local name: Yeşil sazan, Kadife balığı

Material Size: 14.6-17.1 cm (FL).

According to characteristics of the 7 specimens; formula of fin rays is D: III-IV,8-9, A: III-IV,6-7, P: I, 16-18, V: II, 9. Lateral line scales 95-101. Transversal scales 14-15/19-20. Gill rakers on the first arch 13-17. Pharyngeal teeth are in uniserial 5-4, 5-5. Bases of dorsal fin and anal fin are short. Colour: Dorsal dark green, flanks light green, and belly greenish yellow.

Leuciscus cephalus (Linnaeus, 1758)-Chub

Local name: Tatlı su kefalı, Kasna

Material Size: 12.0-14.9 cm (SL).

According to characteristics of the 30 specimens; formula of fin rays is D: II, 8, A: II, 8-9, P: I, 14, V: II, 8-9. Lateral line scales 44-45. Transversal scales 10-14/7-9. The number of gill rakers on the first arch is 16. Pharyngeal teeth are in uniserial 2.5-5.2. SL/BD: 3.48, BD/HL:1.24 HL/ED:4.90. Mouth is terminal, with a pair of short barbels at its corner. Colour: Back brownish-dark green Lateral sides green. Ventral side is golden-yellow. Anal and ventral fins are orange.

Barbus plebejus escherichi Steindachner, 1897-Barbel

Local name: Bryıklı balık, Karacamoloz

Material size: 14.6-19.4 cm (FL).

According to characteristics of the 7 specimens; formula of fin rays is D: III, 8, A: III, 5, P: I, 16-17, V: II, 8. Lateral line scales 56-58. Transversal scales 10-14/7-9. The number of gill rakers on the first arch is 7 and 10. Mouth is inferior with two pair of barbels. The lips are well developed. Colour: Dorsal dark-olive green; lateral and ventral sides light brown; Dorsal, anal and caudal fins and body are with untidy dark spots.

***Carassius carassius* Linneaus, 1758-Crucian Carp**

Terra typica: Europe

Local name: İsrail sazani, Havuz balığı

Material examined: İkizcetepeler Dam Lake, 14 specimens, Size: 32.0-41.0 cm (TL)

Diagnostic characteristics: Body deep and laterally compressed, TL/BD: 0.210-0.282, BD/HL:0.122, Scales are large, no barbels, Pharyngeal teeth are in uniserial 4-4, Dorsal fin rays III, 16-21; anal fin rays II, 5-6, pectoral rays I, 14-15 ventral rays I, 6, Lateral line scales 33-37, Transversal scales 5/6-8 Gill rakers: 17-23, no barbels. The third dorsal and anal fin rays are strong and serrated posteriorly. Colour: Back leaden coloured, light silvery-white toward ventral side.

Family: Cobitidae

***Cobitis taenia* Linneaus, 1758-Spined loach**

Local name: Taş emen

Red List Category & Criteria: LR/Ic

Material Size: 11.6-13.1 cm (FL),

According to characteristics of the 7 specimens; formula of fin rays is D: III, 6-7, A: III, 5, P: I, 6-8, V: II, 5-6. The number of gill rakers on the first arch is 7-10. Mouth is inferior with three pair of barbels at the corner of mouth. Pharyngeal teeth are very small, one row, Dorsal fin middle of the body, Caudal fin with one lob. Colour: Dorsal yellowish- grey, lateral sides with 15-18 dark spots, a black spot at the base of caudal fin.

DISCUSSION

Morphologies of the fish in İkizcetepeler Dam Lake are given in this study, The results about the metric and meristic characteristics are discussed by comparing with those obtained from the previous studies, As a result, eight species and three subspecies from Cyprinidae and one species from Cobitidae are determined.

L. cephalus and *B. plebejus escherichi* mentioned by Geldiay and Balık (30), Alaş et al., (34), Balık et al., (39), Özuluğ et al., (44), Onaran et al., (53) in lakes and the streams reaching the lakes are also encountered in İkizcetepeler Dam Lake. The body ratios of and meristic characters of *L. cephalus* are similar to the findings of Slastenenko (54-55), Geldiay and Balık (30), Örün and Erdemli (32), Alaş et al., (34), Özuluğ (35), Uğurlu- Helli and Nazmi Polat (40), Yılmaz et al., (41), Barlas and Dirican (42), Onaran et al.,(53), but to those by Ekingen and Sarıeyyüpoğlu (20). This difference may stem from the fact that the bases of last two branched rays in the dorsal and anal may be thought to be one, and the number of lateral line scales 56-63 by Barlas and Dirican (42) and Onaran et al. (53) as 42-46 in 122 samples are also found different with our data as 44-45. The body ratios of and meristic characters of

Barbus plebejus escherichi are similar to the findings as 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 (56), D:III-IV 7-8, A: III 5, L.lat: 53-63, number of gill spine: 8-13 (30), Örün and Erdemli (32), Özuluğ (35), Uğurlu- Helli and Nazmi Polat (40), Yılmaz et al. (41), Barlas and Dirican (42), D: III 8, A:III 5, L.lat:56-63, number of gill spine: 7-10 (53).

The meristic characteristics of *C. tinca* are similar to the findings of Slastenenko (54-55), Çelikkale (27), Geldiay and Balık (30). Line lateral scales are found to be 64-80 by Geldiay and Balık (30), 68-81 by Özuluğ et al. (35), 75-85 by Helli and Polat (40), and 68-79 in our samples. Line transversal scales are found to be 9 by Slastenenko (54-55), 18-21 by Geldiay and Balık (30) and 10-14 by Helli and Polat (40), and 19-20 in our samples. More reliable results can be obtained with meristic characteristics of the *C. tinca* population both inhabiting the İkizcetepeler Dam Lake and in other rivers

The ranges of meristic characteristics of *T. tinca* in this study are in accordance with relevant literature (54-55, 30,35). Gill rakers on the first arch are noted as 12-13 by Slastenenko, (54-55); 13-17 (44), while as 20-25 by Uğurlu and Polat (40).

Gill rakers on the first arch of *C. calchoides* are 19-25, according to Slastenenko (54-55), 22-29 by Özuluğ (35), while they are usually found to be 22-24. Lateral line scales of *C. calchoides* are 57-70, 58-60 according to Geldiay and Balık (30), and Alaş et al. (34), respectively while they are usually 61-67 according to Özuluğ (35). The number of lateral line scales is found to be 57-69 in accordance with the previous literature.

The meristic characteristics of *C. taenia* found in this study as D=III, 7, A=III, 5-6, V=II, 5-6, P=I, 7-8 are similar to Alaş et al. (34) and Özuluğ (35).

Although *C. carassius* is considered a native species of the British Isles by Wheeler (6), The crucian carp *C. carassius* is a widespread fish species in Eurasia, living in all kinds of water bodies. It is most common in small lakes and ponds, where it can achieve high density in allopatry (57, 58). The crucian carp, *Carassius carassius* (L.), is a small fish of restricted distribution in the UK, which is probably only native to central and eastern England. The crucian carp is endemic to northern Europe.

C. carassius encountered by (45) is also a new record for Asi (Orontes) River (33). While 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; D:III-IV 15-20, A:II-III 4-6; P: I 11-16, V:II 8-9, L.lat: 28-31 in 153 samples (30, 53), D:III-IV 14-21, A:II-III 5-8; P: I 11-16, V:II 8-9, L.lat:28-37 Pharynx teeth: 4-4; Gill rakers on the first arch count 22-33 were also determined (59). Our findings on this species confirm the relevant studies, especially on the base of gill rakers. The ratio of body depth to total length ranged from 0.297 to 0.315 (58), while this ratio was found 0.248, ranging 0.210- 0.282 in this study.

C. carpio, encountered by Özuluğ (35, 44) from Büyükçekmece Dam Lake and İznik Lake and also in this research, are given as new record for Büyükçekmece Dam Lake by Özuluğ and Meriç (1997), and is an introduced species into İkizcetepeler Dam Lake, The meristic characteristics of *C. carpio* found in this study are similar to Özuluğ (35), while they are found as D=IV, 17- 18, A=III, 5, V=I, 8-9, P=II,15, L.lat=34-37; D=IV, 17-18, V=I, 8-9, P=II,15; by Erdem (21,

22) from Beyşehir Lake and Apa Dam Lake. Our finding of dorsal fin rays confirms the relevant literature.

In conclusion, The İkizcetepeler Dam Lake houses rich fresh water fish fauna and their populations with favourite physicochemical and ecological features (pH: 8.6, temperature: 26°C, no salt), which increases the importance of the İkizcetepeler Dam Lake in the usages of drinking and 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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