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The Fish Fauna of the Atatürk Dam Lake (Adıyaman/Turkey)

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Abstract

This study was carried out between November 2013 and May 2015, to determine the fish fauna inhabited in the Atatürk Dam lake. The specimens were obtained by different technical fishing gears. It was determined that specimens caught were belonging to 25 species (*Capoeta trutta, Capoeta umbla, Cyprinon macrostomus, Arabibarbus grypus, Carasobarbus luteus, Carassius carassius, Carassius gibelio, Cyprinus carpio, Garra variabilis, Luciobarbus esocinus, Luciobarbus mystaceus, Luciobarbus xanthopterus, Acanthobrama marmid, Alburnus mossulensis, Chondrostoma regium, Leuciscus vorax, Squalius cephalus, Cobitis elazigensis, Mystus pelusius, Silurus glanis, Silurus triostegus, Glyptothorax kurdistanicus, Oncorhynchus mykiss, Mastacembelus mastacembelus, Planiliza abu*) and 8 families (Cyprinidae, Cobitidae, Bagridae, Siluridae, Sisoridae, Salmonidae, Mastacembelidae, Mugilidae) were identifed. The most dominant family in the Atatürk Dam Lake is the Cyprinidae with 17 species and eightteen species within 25 species that were identified have commercial value. The existence of *Silurus glanis, Mystus pelusius* and *Carassius carassius* was determined for the first time in Atatürk Dam Lake and they are new records for the lake.

Keywords:
Atatürk Dam Lake, Adıyaman, Fish species, Ichthyofauna, Turkey
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Introduction

Recent documentations on the number of species in the inland waters ichthyofauna of Turkey indicates that further studies would establish better inventory. (Kuru, 2004), 236; (Ronald et al., 2007), 261; (Kuru et al., 2014), 371 and (Çiçek et al., 2015) reported the number as 368. However, it was claimed to be 384 in the latest report (Çiçek et al., 2020). The total of these 384 fish species belong to 20 orders and 34 families in the inland waters of Turkey.

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Atatürk Dam Lake constructed on 2800 km long Euphrates River, of which 1263 km part is the territory of Turkey, is ranked as the largest in Turkey and one of the most prominent ones in the world. The dam lake is 180 km long and covers an area of 817 km2 at maximum management level. Having a great contribution to the diversity of species in its zoogeographical region thanks to its large reservoir and having a special importance by sheltering localized fish species such as *Arabibarbus grypus, Silurus triostegus, Mastacembelus mastacembelus, Mystus pelusius, Garra variabilis, Glyptothorax kurdistanicus, Capoeta trutta, Capoeta umbla, Planiliza abu* it has great potential for fisheries due to large water carrying capacity.

First of all, an inventory of existent biodiversity and their potentials has to be well established for sustainable fisheries and obtaining economic benefits from natural resources of living organisms. This study was conducted to enlist the fishes of Atatürk Dam Lake, which has an important potential for fisheries with great water carrying capacity, and to evaluate their taxonomic status to be able to contribute to the goals of sustainable and profitable use of the natural resources. It is believed that the results of the study will serve for identifying the geographical distribution status of inland water fish species.

Materials and Method

The study has been carried out between November 2013 and May 2015. Fish specimens were obtained by fishing or collecting samples from fishermen. Fishing has been carried out using trammel nets and gill nets with mesh size from 36 mm to 250 mm, casting nets and scoop nets in the 11fishing areas of Atatürk Dam Lake within the Adiyaman province borders (Figure 1).

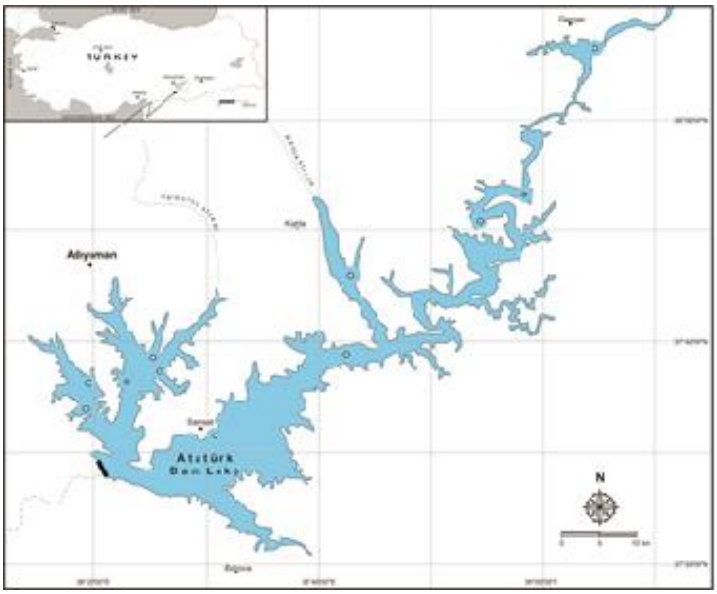

Figure 1. Fishing areas of Atatürk Dam Lake

The record of color-pattern features and taking picture of collected specimens has been completed either on-spot where they were caught or in the laboratory following cold storage transfer to the laboratory. The specimens were finally stored for protection in the laboratory of Kahta Vacational Colledge, Adiyaman University after fixation in 4% formaldehyde followed by preservetiaon in 70% alcohol.

Metric characteristics of fish were measured using milimetric scale and digital caliper at 0.01 mm precision. Meristic features; number of fin rays, scales on the lateral line, transversal scales and pharyngeal teeth, were counted using magnifier and stereo microscope. Identification of the species and determination of taxonomic status of them has been carried out according to Slastenenko (1955-1956), Berg (1962; 1964), Geldiay & Balık (2009), Kuru (1975-a; 1975-b), Ekingen & Sarıeyyüpoğlu (1981), Ekingen & Ebrucan (1993), Balık & Ustaoğlu (2008), Polat & Uğurlu (2011) and Yıldırım et al. (2012).

Results

This study resulted in the identification of 25 fish species belonging to 8 families. Identified species and their taxonomic status were given according to (Çiçek et al., 2015).

Family: CYPRINIDAE

1- *Capoeta trutta* (Heckel, 1843), (Figure 2)

English name : Longspine Scraper
Number of specimens : 27
Range of total length : 20.5-40.0 cm
Diagnostic characteristics : D II-III 8-9, A II-III 5-6, P I-II 12-13, V I 7-8, LL: 77-83, LT: 15 17/12-13
Pharyngeal teeth : 2.3.4-4.3.2

Figure 2. *Capoeta trutta* (Heckel, 1843).

2- *Capoeta umbla* (Heckel, 1843), (Figure 3)

English name : Tigris scraper
Number of specimens : 13
Range of total length : 25.0-48.0 cm
Diagnostic characteristics : D III 9-10, A II-III 5-6, P I 13-18, V I-II 8-9 LL: 79-87, LT: 16-17/12-14
Pharyngeal teeth : 2.3.4-4.3.2

Figure 3. *Capoeta umbla* (Heckel, 1843).

3- *Cyprinion macrostomus* (Heckel, 1843), (Figure 4)

English name : Tigris kingfish
Number of specimens : 5
Range of total length : 18.0-21.5 cm
Diagnostic characteristics : D III-IV 15-17, A II-III 7-8, P I 10-13, V I 8, LL: 41-42, LT: 7-8/4
Pharyngeal teeth : 2.3.4-4.3.2

Figure 4. *Cyprinion macrostomus* (Heckel, 1843).

4- *Arabibarbus grypus* (Heckel, 1843), (Figure 5)

English name : Shabout
Number of specimens : 18
Range of total length : 61.0-97.5 cm
Diagnostic characteristics : D II-III 7- 8, A II 5-6, P I 13-14, V I-II 7-8, LL: 34-40, LT: 5-6/4,
Pharyngeal teeth : 2.3.5-5.3.2

Figure 5. *Arabibarbus grypus* (Heckel, 1843).

5- *Carasobarbus luteus* (Heckel, 1843), (Figure 6)

English name : Yellow barbell
Number of specimens : 21
Range of total length : 31.8-44.5 cm
Diagnostic characteristics : D III-IV 10-11, A II 6-7, P I/13-14, V I 8 LL: 24-29, LT: 5-6/4,
Pharyngeal teeth : 2.3.5-5.3.2

Figure 6. *Carasobarbus luteus* (Heckel, 1843).

6- *Carassius carassius* (Linnaeus, 1758), (Figure 7)

English name : Prussian carp
Number of specimens : 8
Range of total length : 26.0-30.4 cm
Diagnostic characteristics : D III 15-20, A III 5-6, P I 14, V I 8, LL: 30-31, LT: 6-7/7
Pharyngeal teeth : 4-4

Figure 7. *Carassius carassius* (Linnaeus, 1758).

7- *Carassius gibelio* (Bloch, 1782), (Figure 8)

English name : Gibel carp
Number of specimens : 7
Range of total length : 18-23.5 cm
Diagnostic characteristics : D III-IV 17-19, A II 6, P I 13-14, V I-II 7-8, LL: 26-28, LT:6-7/6-7
Pharyngeal teeth : 4-4

Figure 8. *Carassius gibelio* (Bloch, 1782).

8- *Cyprinus carpio* (Linnaeus, 1758), (Figure 9)

English name : Common carp
Number of specimens : 22
Range of total length : 30.0-75.0 cm
Diagnostic characteristics : D III 19-21, A II 5- 6, P I 12-15, V I-II 8-9, LL: 31-38, LT: 6-7/5-6

Pharyngeal teeth : 1.1.3-3.1.1

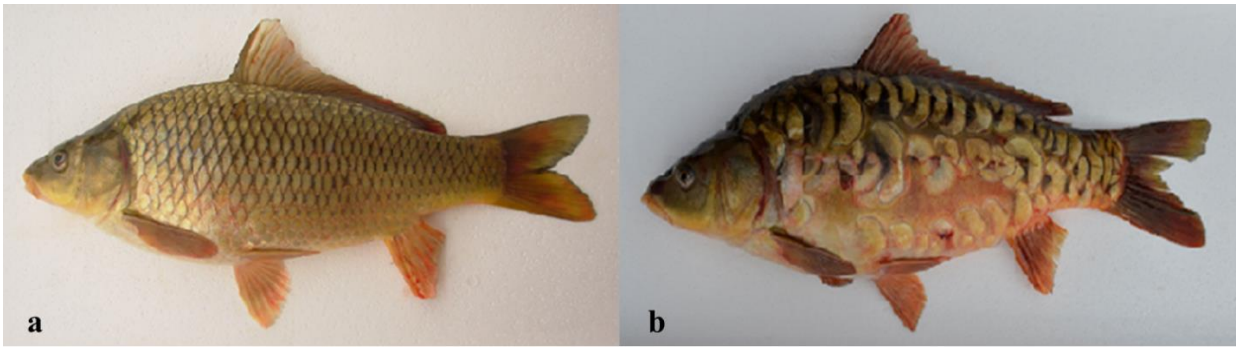

Figure 9. a) *Cyprinus carpio* (Linnaeus, 1758), b) *Cyprinus carpio* (Linnaeus, 1758).

9- *Garra variabilis* (Heckel, 1843), (Figure 10)

English name : Variable garra
Number of specimens : 1
Range of total length : 16.5 cm
Diagnostic characteristics : D II 7, A II 5, P I 13, V I 8, LL: 37, LT: 4/4
Pharyngeal teeth : 2.4.5-5.4.2

Figure 10. *Garra variabilis* (Heckel, 1843).

10- *Luciobarbus esocinus* (Heckel, 1843), (Figure 11)

English name : Pike barbell
Number of specimens : 13
Range of total length : 50.0-111.0 cm
Diagnostic characteristics : D II-III 8, A II-III 6, P I-II 14-16, V I 8, LL: 65-74, LT: 13-14/8
Pharyngeal teeth : 2.3.5-5.3.2

Figure 11. *Luciobarbus esocinus* (Heckel, 1843).

11- *Luciobarbus mystaceus* (Pallas, 1814), (Figure 12)

English name : Euphrates barbell
Number of specimens : 11
Range of total length : 47.0-82.0 cm
Diagnostic characteristics : D III 8, A II-III 5, P I 15-17, V I 8, LL: 54-56, LT: 10-11/7-8
Pharyngeal teeth : 2.3.4-4.3.2

Figure 12. *Luciobarbus mystaceus* (Pallas, 1814).

12- *Luciobarbus xanthopterus* (Heckel, 1843), (Figure 13)

English name : Yellowfin barbell
Number of specimens : 7
Range of total length : 42.0-52.0 cm
Diagnostic characteristics : D III 8-9, A II-III 5-6, P I 14-16, V I 8, LL: 57-66, LT: 11-14/7-8
Pharyngeal teeth : 2.3.5-5.3.2

Figure 13. *Luciobarbus xanthopterus* (Heckel, 1843).

13- *Acanthobrama marmid* (Heckel, 1843), (Figure 14)

English name : Tigris bream
Number of specimens : 22
Range of total length : 20.0-23.5 cm
Diagnostic characteristics : D III 7-8, A II 15-17, P I 13-14, V I 7-9, LL: 62-69, LT: 12-14/6-7
Pharyngeal teeth : 5-5

Figure 14. *Acanthobrama marmid* (Heckel, 1843).

14- *Alburnus mossulensis* (Heckel, 1843), (Figure 15)

English name : Mossul bleak
Number of specimens : 24
Range of total length : 14.0-24.0 cm
Diagnostic characteristics : D II 8-9, A II-III 12-13, P I 12-14, V I 8-9, LL: 74-87, LT: 15/5-6
Pharyngeal teeth : 2.5-5.2

Figure 15. *Alburnus mossulensis* (Heckel, 1843)

15- *Chondrostoma regium* (Heckel, 1843), (Figure 16)

English name : King nase
Number of specimens : 17
Range of total length : 26.0-30.5 cm
Diagnostic characteristics : D II-III 8-9, A II-III 11-12, P I 12-13, V I 7-8, LL: 62-72, LT: 12-14/5-6
Pharyngeal teeth : 7-6

Figure 16. *Chondrostoma regium* (Heckel, 1843)

16- *Leuciscus vorax* (Heckel, 1843), (Figure 17)

English name : Tigris asp
Number of specimens : 8
Range of total length : 48.5-64.0 cm
Diagnostic characteristic : D III 9, A III 11-12, P I 16, V I 8-9, LL: 99-102, LT: 17-18/6-7
Pharyngeal teeth : 3.5-5.3

Figure 17. *Leuciscus vorax* (Heckel, 1843)

17- *Squalius cephalus* (Linnaeus, 1758), (Figure 18)

English name : European chub
Number of specimens : 2
Range of total length : 32.0-53.5 cm
Diagnostic characteristics : D III 8-9, A III 8-10, P I 15, V II 8-9, LL: 43-47, LT: 7-8/4
Pharyngeal teeth : 2.5-5.2

Figure 18. *Squalius cephalus* (Linnaeus, 1758)

Family: COBITIDAE

18- *Cobitis elazigensis* (Coad and Sarieyyüpoğlu, 1988), (Figure 19)

English name : Tigris spined loach
Number of specimens : 1
Range of total length : 18.5 cm
Diagnostic characteristics : D III 6, A III 6, P I 8, V II 6
Pharyngeal teeth : 8-8

Figure 19. *Cobitis elazigensis* (Coad and Sarieyyüpoğlu, 1988).

Family: BAGRIDAE

19- *Mystus pelusius* (Solander, 1794), (Figure 20)

English name : Tigris mystus
Number of specimens : 6
Range of total length : 15.5-20.5 cm
Diagnostic characteristics : D I 7, A I 9, P I 7, V I 5

Figure 20. *Mystus pelusius* (Solander, 1794).

Family: SILURIDAE

20- *Silurus glanis* (Linnaeus, 1758), (Figure 21)

English name : Wels catfish
Number of specimens : 1
Range of total length : 83.2 cm
Diagnostic characteristics : D IV, A 83, P I-14, V 10, C 17

Figure 21. *Silurus glanis* (Linnaeus, 1758).

21- *Silurus triostegus* (Heckel, 1843), (Figure 22)

English name : Tigris catfish
Number of specimens : 12
Range of total length : 82.0-103.0 cm
Diagnostic characteristics : D I 3, A I 91-103, P I 12-14, V 10-13, C 13-14

Figure 22. *Silurus triostegus* (Heckel, 1843).

Family: SISORIDAE

22- *Glyptothorax kurdistanicus* (Berg, 1931), (Figure 23)

English name : Iran cat
Number of specimens : 2
Range of total length : 16.5-20.5 cm
Diagnostic characteristics : D II 6, A III 8, P I 8, V I 5, C 17

Figure 23. *Glyptothorax kurdistanicus* (Berg, 1931).

Family: SALMONIDAE

23- *Oncorhynchus mykiss* (Walbaum, 1792), (Figure 24)

English name : Rainbow trout
Number of specimens : 10
Range of total length : 28.5-77.0 cm
Diagnostic characteristics : D III-IV 10-11, A III 9-10, P I 12-14, V I 8-9, LL: 125-140

Figure 24. *Oncorhynchus mykiss* (Walbaum, 1792).

Family: MASTACEMBELIDAE

24- *Mastacembelus mastacembelus* (Banks&Solander in Russell, 1794), (Figure 25)

English name : Euphrates spiny eel
Number of specimens : 11
Range of total length : 50.5-64.5 cm
Diagnostic characteristics : D XXXII-XXXIII 74-84, A III 72-80, P 20-22

Figure 25. *Mastacembelus mastacembelus* (Banks&Solander in Russell, 1794).

Family: MUGILIDAE

25- *Planiliza abu* (Heckel, 1843), (Figure 26)

English name : Abu mullet
Number of specimens : 18
Range of total length : 19.0-21.7 cm

Diagnostic characteristics : D1 IV, D2 I-II 7-8 A III 7-8, P I 12-14 , V I 5, LL: 47-49, LT: 6-7-8/6-7

Figure 26. *Planiliza abu* (Heckel, 1843).

Discussion

As the result of this study it was determined that 25 species belonging to eight families exist in Atatürk Dam Lake. This means that 6.5% of ichthyofauna repoted from Turkey by (Çiçek et al., 2020) is present in the dam lake. While the predominant family in Atatürk Dam Lake is Cyprinidae represented with 17 taxa, Siluridae has two representative species and remaining seven families; Cobitidae, Bagridae, Sisoridae, Salmonidae, Mastacembelidae and Mugilidae, have only one species for each in the lake. Most of the species, e.g. *C. trutta, C.umbla, C. macrostomus, A. grypus, C. luteus, G. variabilis, L. esocinus, A. mossulensis*, *L. mystaceus, L. xanthopterus, A. mossulensis, L. vorax, M. pelusius, S. triostegus, G. kurdistanicus, M. mastacembelus* and *P. abu*, living in the dam lake are species that are localized in Orontes River basin and Euphrates-Tigris River basin (Geldiay & Balık, 2009; Kuru, 1975a-1975b; Ronald et al., 2007). Among the specified species, *C. trutta, C. umbla, C. luteus, C. carassius, G. variabilis, A. marmid, C. regium, L. vorax, S. cephalus, C. elazigensis, M. pelusius, S. glanis, S. triostegus, M. mastacembelus* and *P. abu* are evaluated as (LC); *A. grypus, C. carpio, L. esocinus, L. xanthopterus*, are evaluated as (VU); *G. kurdistanicus* was evaluated as (DD) in the (IUCN 2020) red list. On the other hand, *C. macrostomus, C. gibelio, L. mystaceus A. mossulensis* and *O. mykiss* are not categorized in the same list. *O. mykiss* observed in the lake is not a native species of the locality. These exotic species was introduced to the lake as the result of escapes from the cages built in the lake for the aquaculture of this species.

Studies on Turkey ichthyofauna of inland water, reveals that the number of fish species in inland waters has been increasing in recent years. In this increase, the number of new species and sub-species recordings has been a major contributor to the increasing number of systematic studies, including narrower geographical regions.

Although some species of the fish has been mentioned in articles on fisheries and basic sciences (Kuru, 1975a; 1975b; Duman & Çelik, 2001; Oymak et al., 2001; Kuru, 2004; Can & İğne, 2005; Başusta & Çiçek, 2006; Şahinöz et al., 2006; Aral et al., 2007; Şahinöz et al., 2007;

Çelik et al., 2008; Oymak et al., 2008; Gümüş et al., 2010; Bayhan & Göçer, 2012; Bayhan et al., 2014; Kuru et al., 2014). There are four reports (Bozkurt, 1994; Erşen, 2003; Ünlü et al., 2014); Kara & Alp, 2016; Başusta & Yeniyol, 2016) concerning the fish fauna of Atatürk Dam Lake. The first report (Bozkurt, 1994), which is on the taxonomy of fish inhabiting Atatürk Dam Lake including streams running into the lake, indicates the presences of a total of 30 species and subspecies belonging to 24 genus in to 8 families. The 19 species found among these species were the same species found in the study we conducted. Although the number of species reported in this study is five more than the findings of this research, this occurrence is due to inclusion of fish occurring in the streams contributing to the lake. In the other fish fauna study conducted by (Erşen, 2003), 15 species and 2 subspecies belonging to 5 families were determined. (Kara & Alp, 2016) determined a total of 26 species belonging to 8 families in the Adıyaman region. On the other hand, according to (Başusta & Yeniyol, 2016), 8 fish species belonging to 3 families were found in the Gerger region of Atatürk Dam Lake. In these four studies, it is considered that the reason of finding different species is due to different time and ecological conditions.

Although it's known that among the 25 detected species, which we have determined in our study, the species of *S. glanis, M. pelusius* and *C. carassius* are already found in the Euphrates-Tigris river basin, it is seen that these species have been detected for the first time in Atatürk Dam Lake and they are the new records for the lake. Besides, *G. variabilis, S. cephalus, C. elazigensis, M. pelusisus* and *G. kurdistanicus* became the least captured species.

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Author Contributions

The author contributions is equal for the preparation research in the manuscript.

Conflict of Interest

The author declare that they have no competing interests.

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