

Freshwater fishes of Turkey: a revised and updated annotated checklist

Erdoğan ÇİÇEK^{1,*}, Sevil Sungur BIRECIKLIGIL¹ and Ronald FRICKE²

1. Nevşehir Hacı Bektaş Veli Üniversitesi, Faculty of Art and Sciences, Department of Biology, 50300, Nevşehir, Turkey. E-mail: erdogancicek@yahoo.com; sevilungur@nevsehir.edu.tr

2. Im Ramstal 76, 97922 Lauda-Königshofen, Germany, and Staatliches Museum für Naturkunde, Rosenstein 1, 70191 Stuttgart, Germany. E-Mail: ronfricke@web.de

*Corresponding author, E. Çiçek, E-mail: erdogancicek@yahoo.com

Received: 24. August 2015 / Accepted: 16. October 2015 / Available online: 20. November 2015 / Printed: December 2015

Abstract. The current status of the inland waters ichthyofauna of Turkey is revised, and an updated checklist of the freshwater fishes is presented. A total of 368 fish species live in the inland waters of Turkey. Among these, 3 species are globally extinct, 5 species are extinct in Turkey, 28 species are non-native and 153 species are considered as endemic to Turkey. We recognise pronounced species richness and a high degree of endemism of the Turkish ichthyofauna (41.58%). Orders with the largest numbers of species in the ichthyofauna of Turkey are the Cypriniformes (247 species), Perciformes (43 species), Salmoniformes (21 species), Cyprinodontiformes (15 species), Siluriformes (10 species), Acipenseriformes (8 species) and Clupeiformes (8 species). At the family level, the Cyprinidae has the greatest number of species (188 species; 51.1% of the total species), followed by the Nemacheilidae (39), Salmonidae (21 species), Cobitidae (20 species), Gobiidae (18 species) and Cyprinodontidae (14 species).

Key words: Freshwater ichthyofauna, Turkey, endemism, introduced, Anatolia.

Introduction

Turkey has a very rich freshwater fish fauna in terms of diversity and endemism and its ichthyofauna is characterized by unique elements of both European and Asian origin (Tarkan et al. 2015). The remarkable Turkish biota has interested foreign naturalists and scientists for a long time, with the first discussion of Turkey freshwater fishes dating back to Abbolt (1835). Studies, both formal and informal, during the following decades significantly increased the knowledge of the Turkish freshwater fish diversity. Research on the fish fauna of Turkey, including the descriptions of new fish species, was performed by foreign (mainly European) researchers including Gӧldenstӧdt, Heckel, Hanks, Berg, Ladiges (Heckel 1843, Hanks 1924, Berg 1962, Ladiges 1960, 1964, 1966). The outstanding work of Prof. Curt Kosswig from 1937 to 1955 resulted in an increase of fisheries research, together with an increasing awareness of fish taxonomy among Turkish researchers (Bilecenođlu et al. 2014).

The first comprehensive book including identification keys on freshwater ichthyofauna of Turkey was published by Geldiay and Balık (1988). Subsequent editions were published in 1996, 1999, 2002, and in a revised edition in 2007 (Geldiay & Balık, 1996, 1999, 2002, 2007). A total of 160 fish species listed living in both freshwaters and transitional water into Turkey with the knowledge on the ecology and distribution of the species.

A first comprehensive checklist of Turkish freshwater fishes was published by Kuru (2004), and subsequently an "Annotated checklist of fish and lamprey species of Turkey" (Fricke et al. 2007). Kuru (2004) reviewed the literature published since 1856, and listed a total of 236 species and subspecies belonging to 26 families. Fricke et al. (2007) reported a total of 248 fish species (plus 13 introduced) occurring in freshwater, and 279 marine fish species (plus eight introduced) in transitional waters.

Although there are quite a number of publications on the freshwater fish taxonomy, the data set for freshwater fish assemblages are still very poor. In this paper, we present an updated checklist of the freshwater fishes of Turkey based on previous checklists (Kuru 2004, Geldiay & Balık 2007,

Fricke et al. 2007), new species records and briefly some of their taxonomic data. Nonetheless, the continuing description of new species of Turkey freshwater fishes makes it clear that the present checklist underestimates, perhaps to a significant degree, the actual richness of that freshwater ichthyofauna. The present study aims in representing the currently known diversity of the freshwater fishes of Turkey.

Material and methods

The species in the following list are compiled from two different sources of information. The data were cross-checked and supplemented by information of recent publications dealing with species present regarding the inland waters of Turkey and/or describing new species of fishes from Turkey. The previously published identification key of Geldiay & Balık (2007), and the checklists of Kuru (2004) and Fricke et al. (2007), are taken as a baseline. In addition, information on fish distribution in FishBase was evaluated (Froese & Pauly 2015). Additional fish records published during the last decade were added, and some questionably species appearing in previous checklists were evaluated, and either verified or excluded from the present list. We follow the family classification of Van der Laan et al. (2015), with orders, families and subfamilies arranged systematically, but genera and species alphabetically within each family/subfamily. The actual taxonomic status of the species follows Eschmeyer and Fricke (2015) unless mentioned otherwise. English names of fish follow Fricke et al. (2007) and Froese & Pauly (2015), most of the Turkish names of fish follow Geldiay & Balık (2007).

In the present checklist, we include only those groups of fishes which spend some parts of their life or their entire life cycles in freshwater habitats, including some marine species entering freshwater habitats during part of their life cycle. Consequently, we exclude the various species that only occur in transitional water.

Some species are excluded from the checklist because (1) they are marine species that do not occur in freshwater habitats, (2) they were erroneously identified, (3) taxa were synonymized and (4) they were probably not occurring in inland waters of Turkey. Such questionable species are to be excluded from the list unless their occurrence can be proven.

Results

The present checklist includes 368 species (plus 10 question-

able species) of fishes as inhabiting freshwater systems in Turkey, with these species distributed across 2 classes, 16 orders and 31 families (Table 1). Dominant in the overall fish fauna is the order Cypriniformes with 247 species or 67.1% of the total fauna follows Perciformes with 43 species (11.7% of total). Other orders with noteworthy numbers of species are the Salmoniformes (21 species), Cyprinodontiformes (15 species) and Siluriformes (10 species). The families with the highest species numbers are the Cyprinidae (188 species, 51.1% of the total species), Nemacheilidae (39 species), Salmonidae (21 species), Cobitidae (20 species), Gobiidae (18 species) and Cyprinodontidae (14 species).

In the checklist, 8 species of extinct freshwater fishes are listed, including 5 species which are extinct in Turkish inland waters, and 3 globally extinct species. A total of 153 species (41.58% of total fish species) is endemic in Turkish freshwater habitats. A total of 28 species (7.61% of the total freshwater fish fauna) consists of non-native, introduced species.

More than 40 marine fish species can be found more or less upper parts of the river and/or stay there for a long time listed in this checklist. These fishes are usually entered and stay in brackish water habitats (coastal lagoons, estuary etc. and even reach upper parts of rivers) for feeding.

Updated checklist of freshwater fishes of Turkey given below as following order: *Species name* (Author) [Occurrence], English Name/Turkish Name/Distribution. (References) Remarks

List of abbreviations in term of occurrence of fish species are: [N] = Native species, [E] = Endemic to Turkey, [I] = Introduced, [LI] = Lessepsian fish species, [ExT] = Extinct in Turkey, [Ex] = Globally extinct

Class PETROMYZONTI

Order PETROMYZONTIFORMES

Family PETROMYZONTIDAE

Caspiomyzon wagneri (Kessler, 1870) [ExT], Caspian lampreys/-/Kura-Aras River Basin. (Fricke et al. 2007). Recorded from Kura River by Berg (1911: 21).

Eudontomyzon mariae (Berg, 1931) [N], Ukrainian brook lamprey/Nehir dokuzgözlüsü/Black Sea watersheds. (Geldiay & Balık 2007, Bilecenoglu et al. 2002, Fricke et al. 2007). Treated as *Eudontomyzon* sp. by Kottelat & Freyhof (2007).

Lampetra lanceolata Kux & Steiner, 1972 [E], Turkish brook lamprey/Türkiye dokuzgözlüsü/Black Sea watersheds. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007) Previous records of *Lampetra fluviatilis* by authors based on this species.

Petromyzon marinus Linnaeus, 1758 [N], Sea lamprey/Derebofa balığı/All coasts of Anatolian watersheds. (Geldiay & Balık 2007, Bilecenoglu et al. 2002, Kuru 2004, Fricke et al. 2007, Çevik et al. 2010, Bilecenoglu et al. 2014)

Class ACTINOPTERI

Order ACIPENSERIFORMES

Family ACIPENSERIDAE

Acipenser colchicus Marti, 1940 [N], Danube sturgeon/Mersin balığı/Black Sea watersheds. (Kottelat & Freyhof 2007)

Acipenser gueldenstaedtii Brandt & Ratzeburg, 1833 [N],

Table 1. Number of families/subfamilies and species in each order and families/subfamilies of fishes present in the freshwaters of Turkey.

| Taxa | # Families | % | # Species | % |
|--------------------|------------|------|-----------|------|
| Petromyzonti | | | | |
| Petromyzontiformes | 1 | 3.2 | 4 | 1.1 |
| Petromyzontidae | | | 4 | 1.1 |
| Actinopteri | | | | |
| Acipenseriformes | 1 | 3.2 | 8 | 2.2 |
| Acipenseridae | | | 8 | 2.2 |
| Anguilliformes | 1 | 3.2 | 1 | 0.3 |
| Anguillidae | | | 1 | 0.3 |
| Clupeiformes | 1 | 3.2 | 8 | 2.2 |
| Clupeidae | | | 8 | 2.2 |
| Cypriniformes | 3 | 9.7 | 247 | 67.1 |
| Cyprinidae | | | 188 | 51.1 |
| Cobitidae | | | 20 | 5.4 |
| Nemacheilidae | | | 39 | 10.6 |
| Characiformes | 1 | 3.2 | 1 | 0.3 |
| Serrasalminidae | | | 1 | 0.3 |
| Siluriformes | 6 | 19.4 | 10 | 2.7 |
| Bagridae | | | 1 | 0.3 |
| Siluridae | | | 2 | 0.5 |
| Sisoridae | | | 4 | 1.1 |
| Clariidae | | | 1 | 0.3 |
| Heteropneustidae | | | 1 | 0.3 |
| Loricariidae | | | 1 | 0.3 |
| Esociformes | 1 | 3.2 | 1 | 0.3 |
| Esocidae | | | 1 | 0.3 |
| Salmoniformes | 1 | 3.2 | 21 | 5.8 |
| Salmonidae | | | 21 | 5.8 |
| Atheriniformes | 1 | 3.2 | 2 | 0.5 |
| Atherinidae | | | 2 | 0.5 |
| Cyprinodontiformes | 2 | 6.5 | 15 | 4.1 |
| Poeciliidae | | | 1 | 0.3 |
| Cyprinodontidae | | | 14 | 3.8 |
| Gasterosteiformes | 1 | 3.2 | 2 | 0.5 |
| Gasterosteidae | | | 2 | 0.5 |
| Syngnathiformes | 1 | 3.2 | 2 | 0.5 |
| Syngnathidae | | | 2 | 0.5 |
| Synbranchiformes | 1 | 3.2 | 1 | 0.3 |
| Mastacembelidae | | | 1 | 0.3 |
| Perciformes | 7 | 22.6 | 43 | 11.7 |
| Moronidae | | | 3 | 0.8 |
| Centrarchidae | | | 1 | 0.3 |
| Percidae | | | 4 | 1.1 |
| Mugilidae | | | 9 | 2.5 |
| Cichlidae | | | 6 | 1.6 |
| Blenniidae | | | 2 | 0.5 |
| Gobiidae | | | 18 | 4.9 |
| Pleuronectiformes | 2 | 6.5 | 2 | 0.5 |
| Scophthalmidae | | | 1 | 0.3 |
| Pleuronectidae | | | 1 | 0.3 |
| Total | 31 | | 368 | |

Russian sturgeon/Rus Mersin balığı/Black Sea watersheds. (Geldiay & Balık 2007, Bilecenoglu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoglu et al. 2014)

Acipenser nudiiventris Lovetsky, 1828 [N], Fringebarbel sturgeon/Sip balığı/Black Sea watersheds. (Bilecenoglu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoglu et al. 2014)

- Acipenser persicus* **Borodin, 1897** [ExT], Persian sturgeon/Iran mersini/Kura-Aras river Basin. (Bat et al. 2005, Fricke et al. 2007)
- Acipenser ruthenus* **Linnaeus, 1758** [N], Sterlet/Çuka balığı/Black Sea watersheds. (Kuru 2004, Fricke et al. 2007)
- Acipenser stellatus* **Pallas, 1771** [N], Starry sturgeon/Kılıç burunlu mersin balığı/Mediterranean, Aegean, Marmara and Black Sea watersheds. (Geldiay & Balık 2007, Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)
- Acipenser sturio* **Linnaeus, 1758** [ExT], Sturgeon/Kolan balığı/Aegean, Marmara and Black Sea watersheds. (Geldiay & Balık 2007, Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)
- Huso huso* (**Linnaeus, 1758**) [N], Beluga/Mersin morinası/Aegean, Marmara and Black Sea watersheds. (Geldiay & Balık 2007, Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)
- Order ANGUILLIFORMES**
- Family ANGUILLIDAE**
- Anguilla anguilla* (**Linnaeus, 1758**) [N], European eel/Yılan balığı/All coasts of Anatolian watersheds. (Geldiay & Balık 2007, Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)
- Order CLUPEIFORMES**
- Family CLUPEIDAE**
- Alosa caspia* (**Eichwald, 1838**) [ExT], Caspian shad/Hazer ringası/Kura-Aras River Basin. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)
- Alosa fallax* (**Lacepède, 1803**) [N], Italian shad/Tirsi balığı/All coasts of Anatolian watersheds. (Geldiay & Balık 2007, Kuru 2004, Kottelat & Freyhof, 2007, Fricke et al. 2007). Previous records of *Alosa agone* (non Scopoli 1786) were based on this species.
- Alosa immaculata* **Bennett, 1835** [N], Pontic shad, spotless shad/Ringa balığı, tirsi balığı/Black Sea watersheds. (Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)
- Alosa maeotica* (**Grimm, 1901**) [N], Black sea shad/Ringa balığı/Black Sea watersheds. (Geldiay & Balık 2007, Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)
- Alosa tanaica* (**Grimm, 1901**) [N], Azov shad/Tirsi balığı/Black Sea and Sea of Marmara watersheds. (Geldiay & Balık 2007, Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)
- Clupeonella cultriventris* (**Nordman, 1840**) [N], Black Sea sprat/Tülka balığı/Black Sea and Sea of Marmara watersheds. (Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)
- Clupeonella muhlisi* **Neu, 1934** [E], Marmara sprat, Apolyont sprat/Cüce ringa, filisa balığı/Apolyont Lake. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Sprattus sprattus* (**Linnaeus, 1758**) [N], European sprat/Çaça, papalina, papatika, platika/All coasts of Anatolian watersheds. (Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014). Species entering freshwater habitats in lower reaches of rivers.
- Order CYPRINIFORMES**
- Family CYPRINIDAE**
- Capoeta angorae* (**Hankó, 1925**) [E], Ankara barb/Siraz balığı/Anatolian Black Sea watersheds. (Geldiay & Balık 2007, Fricke et al. 2007)
- Capoeta antalyensis* (**Battalgil, 1944**) [E], Antalya barb/Siraz balığı/Antalya Bay watersheds. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Capoeta baliki* **Turan, Kottelat, Ekmekçi & Imamoğlu, 2006** [E], Sakarya barb/Siraz balığı/Western Anatolian Black Sea watersheds. (Geldiay & Balık 2007, Fricke et al. 2007)
- Capoeta banarescui* **Turan, Kottelat, Ekmekçi & Imamoğlu, 2006** [E], Banarescu's barb/Siraz balığı/Çoruh River, northeastern Black Sea. (Fricke et al. 2007)
- Capoeta barroisi* **Lortet, 1894** [N], Tigris barb/Siraz balığı/Orontes, Euphrates and Tigris river basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Capoeta bergamae* **Karaman, 1969** [E], Bergama barb/Siraz balığı/Aegean Sea watersheds. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Capoeta caelestis* **Schöter, Özuluğ & Freyhof, 2009** [E], Taurus scraper/Siraz balığı/Göksu drainage in southern Anatolia. (Schöter et al. 2009)
- Capoeta capoeta* (**Güldenstädt, 1773**) [N], Transcaucasian barb/Siraz balığı, aptalca/Aras River Basin, Eastern Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Capoeta damascina* (**Valenciennes, 1842**) [N], Mesopotamian barb/Kara balığı/Southeastern Anatolia. (Fricke et al. 2007)
- Capoeta ekmekciae* **Turan, Kottelat, Kirankaya, Engin, 2006** [E], Grusinian scraper/Siraz balığı/Çoruh River, eastern Black Sea watersheds. (Fricke et al. 2007)
- Capoeta erhani* **Turan, Kottelat & Ekmekçi, 2008** [E], Ceyhan scraper/Siraz balığı/Ceyhan River. (Turan et al. 2008a)
- Capoeta kosswigi* **Karaman, 1969** [E], Van barb/Siraz balığı/Van Lake Basin. (Geldiay & Balık 2007, Fricke et al. 2007)
- Capoeta mauricii* **Küçük, Turan, Şahin & Gülle, 2009** [E], Longsnout scraper/Siraz balığı/Lake Beyşehir. (Küçük et al. 2009)
- Capoeta pestai* (**Pietschmann, 1933**) [E], Eğirdir barb/Siraz balığı/Central Anatolia. (Geldiay & Balık 2007, Fricke et al. 2007)
- Capoeta sieboldii* (**Steindachner, 1864**) [N], Colchic khramulya/Siraz balığı/Black Sea watersheds. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Capoeta tinca* (**Heckel, 1843**) [E], Anatolian khramulya/Kara balığı, Siraz balığı/Black Sea watersheds. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Capoeta trutta* (**Heckel, 1843**) [N], Trout barb/Kara balığı, lekeleli siraz balığı/Euphrates and Tigris river basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Capoeta turani* **Özuluğ & Freyhof, 2008** [E], Seyhan scraper/Siraz balığı/Seyhan River drainage, southern Anatolia. (Özuluğ & Freyhof 2008a)
- Capoeta umbla* (**Heckel, 1843**) [N], Tigris scraper/Siraz balığı/Euphrates and Tigris river basins. (Geldiay & Balık 2007, Kuru 2004)
- Cyprinion kais* **Heckel, 1843** [N], Kais kingfish/-/Euphrates and Tigris river basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Cyprinion macrostomum* **Heckel, 1843** [N], Tigris kingfish/Beni balığı/Southeastern Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)

- Hemigrammocapoeta culiciphaga* **Pellegrin, 1927** [N], Red stripe barb/-/Seyhan, Ceyhan and Orontes river basins (Pellegrin 1927). Previously misidentified as *H. nana* (non Heckel, 1843) by authors.
- Hemigrammocapoeta kemali* (**Hankó, 1925**) [E], Ereğli minnow-/Konya, central Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Leucalburnus satunini* (**Berg, 1910**) [N], White Kura bleak/-/Kura Rives Basin. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Subfamily ACHEILOGNATHINAE**
- Rhodeus amarus* (**Bloch, 1782**) [N], European bitterling/Acıbalık/Northwestern Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Subfamily CYPRININAE**
- Arabibarbus grypus* (**Heckel, 1843**) [N], Shabout/Şaput, şabot /Euphrates and Tigris river basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Barbus bergi* **Chichkoff, 1935** [N], -/European Black Sea watersheds. (Fricke et al. 2007 as *Barbus barbuis* (non Linnaeus, 1758), Kottelat & Freyhof 2007)
- Barbus cyclolepis* **Heckel, 1839** [N], Round-scaled barbell/Bıyıklı balık/Aegean Sea watersheds. (Fricke et al. 2007)
- Barbus cyri* **De Filippi, 1865** [N], Barbell/Bıyıklı balık/Kura-Aras River Basin. (Levin et al. 2012)
- Barbus ercisianus* **Karaman, 1971** [E], Erçis barbell/Bıyıklı balık/Van Lake Basin. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Barbus lacerta* **Heckel, 1843** [N], Kura barbell/Bıyıklı balık/Eastern Anatolia, Tigris River Basin. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Barbus lorteti* **Sauvage, 1882** [E], Lortet's barbell/Maya balığı/Orontes River, Hatay. (Fricke et al. 2007)
- Barbus niluferensis* **Turan, Kottelat & Ekmekçi, 2009** [E], Simav Barbel/-/Nilufer River, Bursa. (Turan et al. 2009a)
- Barbus oligolepis* **Battalgil, 1941** [E], Marmara barbel/-/Southern coast of Marmara Seawatersheds. (Turan et al. 2009a)
- Barbus pergamonensis* **Karaman, 1971** [E], Bergama barbell/-/Bakır and Büyük Menderes rivers. (Kuru 2004, Fricke et al. 2007 as *Barbus cyclolepis* in part)
- Barbus tauricus* **Kessler, 1877** [N], Crimean barbell/-/Black Sea watersheds. (Fricke et al. 2007)
- Carasobarbus chantrei* (**Sauvage, 1882**) [N], Antakya barbell/Bıyıklı balık/Orontes river Basin. (Fricke et al. 2007)
- Carasobarbus kosswigi* (**Ladiges, 1960**) [N], Kosswig's barb/-/Euphrates and Tigris river basins. (Borkenhagen & Krupp 2013)
- Carasobarbus luteus* (**Heckel, 1843**) [N], Yellow barbell/Bizir/Southeastern Turkey. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Carassius auratus* (**Linnaeus, 1758**) [I], Gold fish/Kırmızı havuz balığı/Widespread other parts of Anatolia. (Fricke et al. 2007)
- Carassius carassius* (**Linnaeus, 1758**) [I], Prussian carp/Havuz balığı/Widespread other parts of Anatolia. (Kuru 2004, Fricke et al. 2007). The species was introduced into Eğirdir Gölü and Beyşehir Gölü (Innal & Erk'akan 2006).
- Carassius gibelio* (**Bloch, 1782**) [I], Gibel carp/Çin sazanı/Widespread other parts of Anatolia. (Kuru 2004, Fricke et al. 2007). May be conspecific with *Carassius auratus* (Fricke et al. 2007).
- Crossocheilus caudomaculatus* (**Battalgil, 1942**) [Ex], Antakya minnow/Lekelisaz balığı/Amik Lake, Orontes River Basin. (Fricke et al. 2007)
- Crossocheilus klatti* (**Kosswig, 1950**) [E], Isparta minnow/Saz balığı/Eğirdir and Gölcük Lakes, central Anatolia. (Fricke et al. 2007)
- Cyprinus carpio* **Linnaeus, 1758** [N], Common carp/Sazan balığı/Widespread other parts of Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Garra rufa* (**Heckel, 1843**) [N], Red garra/Yağlı balığı/ Euphrates and Tigris river basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Garra variabilis* (**Heckel, 1843**) [N], Variable garra/Yarışkan balığı/Southeastern Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Luciobarbus barbuis* **Heckel, 1847** [N], Barbell/Bıyıklı balık/ Quwayq, Euphrates and Tigris river basins. (Fricke et al. 2007)
- Luciobarbus capito* (**Güldenstädt, 1773**) [N], Bulatamai barbell/Bıyıklı balık/Kura-Aras River basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Luciobarbus caspius* (**Berg, 1914**) [N], Caspian barbell/-/Kura-Aras River Basin. (Fricke et al. 2007)
- Luciobarbus escherichii* **Steindachner, 1897** [E], Ankara barbell/Bıyıklı balık/Northern and western Anatolia. (Geldiay & Balık 2007)
- Luciobarbus esocinus* **Heckel, 1843** [N], Pike barbell/Cero/Euphrates and Tigris river basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Luciobarbus kersin* (**Heckel, 1843**) [N], Kersin barbell/Kersin balığı/Euphrates and Tigris river basins. (Fricke et al. 2007)
- Luciobarbus kosswigi* (**Karaman, 1971**) [N], Kosswig's barbell/-/Tigris watershed, Hakkari. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Luciobarbus kottelati* **Turan, Ekmekçi, İlhan & Engin, 2008** [E], Menderes barbel/-/River Büyük Menderes, Aegean Sea drainage. (Turan et al. 2008b)
- Luciobarbus lydianus* (**Boulenger, 1896**) [E], Lydian barbel/-/Aegean and Marmara Sea watersheds. (Turan et al. 2008b)
- Luciobarbus mursa* (**Güldenstädt, 1773**) [N], Mursa/Murzu/Kura-Aras River Basin. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Luciobarbus mystaceus* (**Pallas, 1814**) [N], Euphrates barbell/Maya balığı/Euphrates and Tigris river basins. (Turan et al. 2008b) Name treated as available by Eschmeyer and Fricke (2015)
- Luciobarbus pectoralis* (**Heckel, 1843**) [N], Heckel's Orontes barbell/Bıyıklı balık/Orontes and some eastern Mediterranean watersheds. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Luciobarbus subquincunciatus* (**Günther, 1868**) [N], Mesopotamian barbell/Bıyıklı balık/Euphrates and Tigris river basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Luciobarbus xanthopterus* **Heckel, 1843** [N], Yellowfin barbell/Maya balığı/Orontes, Euphrates and Tigris river basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Schizothorax prophyllax* **Pietschmann, 1933** [E], Eğirdir

- marinka/-/Eğirdir Gölü. (Kuru 2004, Fricke et al. 2007)
- Subfamily TINCINAE**
- Tinca tinca* (Linnaeus, 1758) [N], Tench/Kadife balığı/European Black Sea watersheds and widespread some parts of Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Subfamily XENOCYPRIDINAE**
- Ctenopharyngodon idella* (Valenciennes, 1844) [I], Grass carp/Ot sazani/Introduced some parts of Turkey for aquatic vegetation control. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Hypophthalmichthys molitrix* (Valenciennes, 1844) [I], Silver carp/-/Species has been producing in hatcheries for stocking inland waters. (Innal, 2012, Tarkan et al. 2015)
- Subfamily GOBIONINAE**
- Gobio battalgiiae* Naseka, Erk'akan & Küçük, 2006 [N], Eylülükler gudgeon/-/Beyşehir Lakewatersheds. (Naseka et al. 2006)
- Gobio bulgaricus* Drensky, 1926 [N], -/-/European Aegean Sea watersheds. (Kottelat & Freyhof 2007, Turan et al. 2012a)
- Gobio gymnotethus* Ladiges, 1960 [E], Cappadocian gudgeon/Derekayası/Eastern Lake Tuz Basin. (Geldiay & Balık 2007, Kuru 2004)
- Gobio hettitorum* Ladiges, 1960 [E], Anatolian gudgeon/Derekayası balığı/Gökdere watersheds, around Karaman, Southern Lake Tuz Basin. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Gobio insuayanus* Ladiges, 1960 [N], Cihanbeyli gudgeon/Derekayası/Western Lake Tuz Basin. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Gobio intermedius* Battalgi, 1944 [N], Eber gudgeon/Derekayası/Aksehir and Eber lakes, central Anatolia. (Geldiay & Balık 2007, Kuru 2004)
- Gobio kovatschevi* Chichkoff, 1937 [N], Varna gudgeon/-/European Black Sea watersheds (Tural et al. 2012a).
- Gobio maeandricus* Naseka, Erk'akan & Küçük, 2006 [N], Işıklı gudgeon/-/Büyük Menderes River Basin. (Naseka et al. 2006)
- Gobio microlepidotus* Battalgi, 1942 [E], Beyşehir gudgeon/Yağlıca, derekayası/BeyşehirLake. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Gobio sakaryaensis* Turan, Ekmekçi, Luskova & Mendel, 2012 [E], Sakarya Gudgeon/-/Tozman Stream and Sakarya River. (Turan et al. 2012a)
- Pseudorasbora parva* (Temminck & Schlegel, 1846) [I], Stone moroko/-/Widespread many resevoirs in Turkey. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Romanogobio macropterus* (Kamensky, 1901) [N], South Caucasian gudgeon/-/Black Sea watersheds. (Naseka & Freyhof 2004)
- Subfamily LEUCISCINAE**
- Abramis brama* (Linnaeus, 1758) [N], Freshwater bream/Çapak balığı, tahta balığı/Marmara, Aegean, Black Sea watersheds and Kura-Aras River Basin. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Acanthobrama centisquama* Heckel, 1843 [N], Orontes bream/-/Orontes River Basin. (Kuru 2004, Fricke et al. 2007)
- Acanthobrama marmid* Heckel, 1843 [N], Tigris bream/Akçapak balığı/Euphrates, Tigris and Orontes river basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007, Küçük et al. 2014)
- Acanthobrama microlepis* (De Filippi, 1863) [N], Blackbrow bleak/Inci balığı/Kura-Aras River Basin. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007, Küçük et al. 2014)
- Acanthobrama orontis* Berg, 1949 [E], -/-/Ceyhan and Orontes river basins. (Küçük et al. 2014, Freyhof & Özuluğ 2014).
- Acanthobrama thisbeae* Freyhof & Özuluğ, 2014 [E], -/-/Ceyhan and Orontes river basins. (Freyhof & Özuluğ 2014). Reported as *Acanthobrama tricolor* by previous authors.
- Alburnoides bipunctatus* (Bloch, 1782) [N], Schneider/Noktalı inci balığı/All Anatolia except south western Anatolia-Mediterranean region. (Geldiay & Balık 2007, Kottelat & Freyhof 2007, Kuru 2004, Fricke et al. 2007)
- Alburnoides eichwaldii* (De Filippi, 1863) [N], Kura chub/Noktalı inci balığı/Kura-Aras River Basin. (Kuru 2004, Fricke et al. 2007)
- Alburnoides emineae* Turan, Kaya, Ekmekçi & Doğan, 2014 [E], Beyazsu chub/-/Beyazsu Stream, drainage of Euphrates River. (Turan et al. 2014a)
- Alburnoides fasciatus* (Nordmann, 1840) [N], Transcaucasian spirilin/-/Northeastern Anatolia. (Kuru 2004)
- Alburnoides manyasensis* Turan, Ekmekçi, Kaya & Güçlü, 2013 [E], Manyas spirilin/-/Koca Stream, drainage of Lake Manyas. (Turan et al. 2013b)
- Alburnoides recepi* Turan, Kaya, Ekmekçi & Doğan, 2014 [E], Recep's chub/-/Merzimen Stream, drainage of Euphrates River. (Turan et al. 2014a)
- Alburnoides velioglui* Turan, Kaya, Ekmekçi & Doğan, 2014 [E], Velioglu's chub/-/Northern Euphrates drainage. (Turan et al. 2014a)
- Alburnus adanensis* Battalgazi, 1944 [E], Adana bleak/Inci balığı/Seyhan and Ceyhan river basins. (Kuru 2004, Fricke et al. 2007)
- Alburnus akili* Battalgi, 1942 [Ex], Beyşehir bleak/Gövce/Beyşehir Lake, Central Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Alburnus alburnus* (Linnaeus, 1758) [N], Bleak/Inci balığı/Marmara Basin, northwestern Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Alburnus attalus* Özuluğ & Freyhof, 2007 [E], Bakır she-maya/-/Drainage of Bakır River, western Anatolia, Aegean Region. (Özuluğ & Freyhof 2007)
- Alburnus baliki* Bogutskaya, Küçük & Ünlü, 2000 [E], Antalya bleak/Inci balığı/Manavgat River, Antalya. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Alburnus battalgiiae* Özuluğ & Freyhof, 2007 [E], Gediz shemaya/Inci balığı/Drainage of Gediz River. (Özuluğ & Freyhof 2007)
- Alburnus caeruleus* Heckel, 1843 [N], Tigris bleak/Inci balığı/Euphrates and Tigris river basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Alburnus carinatus* Battalgi, 1941 [E], Manyas she-maya/Inci balığı/Manyas and Apolyont (Uluabat) Lakes. (Freyhof & Kottelat 2007)
- Alburnus demiri* Özuluğ & Freyhof, 2008 [E], Eastern Aegean bleak/Inci balığı/Western Anatolia. (Özuluğ & Freyhof 2008b)
- Alburnus chalcoides* (Güldenstadt, 1772) [N], Caspian she-

- maya/Tatlısu kolyoz balığı/Black Sea and Caspian Sea watersheds of Anatolia, introduced many lakes in Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Alburnus derjugini* Berg, 1923 [N], Georgian shemaya/İnci balığı/Harşit River, Giresun. (Kottelat & Freyhof 2007)
- Alburnus escherichii* Steindachner, 1897 [E], North Caucasian bleak/İnci balığı/Sakarya and Kızılırmak river basins. (Kuru 2004, Fricke et al. 2007)
- Alburnus filippii* Kessler, 1877 [N], Kura bleak/İnci balığı/Kura-Aras River Basin. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Alburnus heckeli* Battalgil, 1944 [E], Hazar bleak/Hazar inci balığı/Hazar Lake. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Alburnus hohenackeri* Kessler, 1877 [N], Transcaucasian bleak/İnci balığı/Kura-Aras River Basin. (Fricke et al. 2007)
- Alburnus istanbulensis* Battalgil, 1941 [E], Thracian shemaya/İnci balığı/Northwestern Anatolia. (Özuluğ & Freyhof 2007)
- Alburnus kotschyi* Steindachner, 1863 [E], Arsuz bleak/İnci balığı/Arsuz Creek, Iskenderun Bay watershed. (Fricke et al. 2007)
- Alburnus mossulensis* Heckel, 1843 [N], Mossul bleak/Tatlısu gümüş balığı/Euphrates and Tigris river basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Alburnus nasreddini* Battalgil, 1944 [E], Eber bleak/İnci balığı/Eber Gölü, Afyonkarahisar. (Kuru 2004, Fricke et al. 2007)
- Alburnus nicaeensis* Battalgil, 1941 [E], Iznik shemaya/İnci balığı/Iznik Lake. (Freyhof & Kottelat 2007)
- Alburnus orontis* Sauvage, 1882 [N], Orontes bleak/Anadolu inci balığı/Orontes River Basin. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Alburnus schischkovi* (Drensky, 1943) [N], Black Sea bleak/-/European Black Sea watersheds (Kottelat & Freyhof 2007)
- Alburnus selcuklui* Elp, Şen & Özuluğ, 2015 [E], Selcuk shemaya/-/Tigris River system. (Elp et al. 2015)
- Alburnus sellal* Heckel, 1843 [N], Sellal bleak/Gümüş balığı/Orontes, Euphrates and Tigris river basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Alburnus tarichi* (Güldenstädt, 1814) [E], Van bleak/İnci kefalı/Van Lake Basin. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Alburnus timarensis* Kuru, 1980 [E], Karasu Sha Kuli/İnci kefalı/Karasu Stream, Van Lake Basin. (Kuru 2004, Elp et al. 2013)
- Blicca bjoerkna* (Linnaeus, 1758) [N], White bream/Tahta balığı/Marmara, Aegean and Black Sea watersheds, Kura-Aras River Basin. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Chondrostoma angorense* Elvira, 1987 [E], Ankara nase/-/Sakarya and Kızılırmak river watersheds. (Fricke et al. 2007)
- Chondrostoma beysehirense* Bogutskaya, 1997 [E], Beyşehir nase/-/Beyşehir Lake. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Chondrostoma colchicum* Derjugin, 1899 [N], Colchic nase/Kababurun balığı/Black Sea watersheds. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Chondrostoma cyri* Kessler, 1877 [N], Kura nase/-/Kura-Aras River Basin. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007 as *Chondrostoma oxyrhynchum*)
- Chondrostoma fahirae* (Ladiges, 1960) [E], Tefenni minnow/İncilevrek balığı/Burdur, Antalya, Muğla provinces. (Fricke et al. 2007)
- Chondrostoma holmwoodii* (Boulenger, 1896) [E], İzmir nase/-/Aegean Sea watersheds. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Chondrostoma kinzelbachi* Krupp, 1985 [N], Orontes nase/-/Orontes River Basin. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Chondrostoma meandrense* Elvira, 1987 [E], Menderes nase/-/Büyük Menderes River Basin. (Kuru 2004, Fricke et al. 2007)
- Chondrostoma nasus* (Linnaeus, 1758) [N], Sneep/Kababurun balığı, çime, kızılkanat/Western Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Chondrostoma regium* (Heckel, 1843) [N], King Nase/Kababurun balığı/Euphrates and Tigris river basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Chondrostoma vardarense* Karaman, 1928 [N], Vardar nase/-/European Aegean Sea watersheds. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Ladigesocypris ghigii* (Gianferrari, 1927) [E], Rhodes minnow/-/Southwestern Anatolia. (Kuru 2004, Fricke et al. 2007)
- Ladigesocypris mermere* (Ladiges, 1960) [E], İzmir minnow/-/Gediz River. (Kuru 2004, Fricke et al. 2007)
- Leucaspius delineatus* (Heckel, 1843) [N], Belica/-/European Black Sea watersheds. (Kuru 2004, Fricke et al. 2007)
- Leuciscus aspius* (Linnaeus, 1758) [N], Asp/Kocaağız balığı/European Black Sea watersheds. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Leuciscus idus* (Linnaeus, 1758) [N], Ide/-/European Black Sea watersheds. (Fricke et al. 2007)
- Leuciscus vorax* (Heckel, 1843) [N], Tigris asp/Sis balığı/Orontes, Euphrates and Tigris river basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Petroleuciscus kurui* (Bogutskaya, 1995) [E], Tigris chub/Tatlısu kefalı/Tigris River basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Petroleuciscus smyrnaeus* (Boulenger, 1896) [E], İzmir chub/-/Aegean Sea watersheds. (Kuru 2004, Fricke et al. 2007)
- Phoxinus phoxinus* (Linnaeus, 1758) [N], Eurasian minnow/Ot balığı/Northwestern Anatolia. (Kuru 2004, Fricke et al. 2007)
- Phoxinus strandjae* Drensky, 1926 [N], Bulgarian minnow/-/European Black Sea watersheds. (Saç & Özuluğ 2015)
- Pseudophoxinus alii* Küçük, 2007 [E], Pamphylian spring minnow/-/Antalya region. (Küçük 2007)
- Pseudophoxinus anatolicus* (Hankó, 1925) [E], Anatolian minnow/Yağ balığı/Beyşehir Gölü, Akgöl and Tuz Gölü. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Pseudophoxinus antalyae* Bogutskaya, 1992 [E], Antalya minnow/-/Kirkgöz Stream and Köprü Çayı, Antalya. (Kuru 2004, Fricke et al. 2007)
- Pseudophoxinus battalgilae* Bogutskaya, 1997 [E], Beyşehir minnow/-/Beyşehir Lake watersheds. (Kuru 2004, Fricke et al. 2007)

- Pseudophoxinus burduricus* Küçük, Gülle, Güçlü, Çiftçi & Erdoğan, 2013 [E], Burdur spring minnow/-/Burdur Lake-watersheds. (Küçük et al. 2013)
- Pseudophoxinus caralis* (Battalgil, 1942) [E], Beyşehir minnow/-/Beyşehir Lake. (Bogustkaya et al. 2006)
- Pseudophoxinus crassus* (Ladiges, 1960) [E], Fat spring minnow/-/Eastern tributaries of Tuz Lake. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Pseudophoxinus egridiri* (Karaman, 1972) [E], Eğirdir minnow/Yağ balığı/Eğirdir Lake. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Pseudophoxinus elizavetae* Bogutskaya, Küçük & Atalay, 2006 [E], Sultan Sazlığı minnow/-/Sultan Sazlığı wetland, Kayseri. (Bogutskaya et al. 2006)
- Pseudophoxinus evliyaie* Freyhof & Özuluğ, 2010 [E], Lycian spring minnow/-/Western Anatolia. (Freyhof & Özuluğ 2010a)
- Pseudophoxinus fahrettini* Freyhof & Özuluğ, 2010 [E], Pisidian spring minnow/-/Köprü River drainage, central Anatolia. (Freyhof & Özuluğ 2010b)
- Pseudophoxinus firati* Bogutskaya, Küçük & Atalay, 2006 [E], Euphrates spring minnow/-/Euphrates River drainage. (Bogutskaya et al. 2006)
- Pseudophoxinus handlirschi* (Pietschmann, 1933) [Ex], Handlirsch's minnow/Kavinne/Eğirdir Lake. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Pseudophoxinus hittitorum* Freyhof & Özuluğ, 2010 [E], Hittitic spring minnow/-/Beyşehir Lake. (Freyhof & Özuluğ 2010c)
- Pseudophoxinus kervillei* (Pellegrin, 1911) [N], Orontes minnow/Ot balığı/Orontes River Basin. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Pseudophoxinus maeandri* (Ladiges, 1960) [E], Apamean spring minnow/-/Upper Büyük Menderes drainage. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Pseudophoxinus maeandricus* (Ladiges, 1960) [E], Menderes brook minnow/Ot balığı/Büyük Menderes River watershed, Hotamis Lake, Aksaray and Niğde. (Kuru 2004)
- Pseudophoxinus ninae* Freyhof & Özuluğ, 2006 [E], Onaç spring minnow/-/Onaç drainage, central Anatolia. (Freyhof & Özuluğ 2006)
- Pseudophoxinus turani* Küçük & Güçlü, 2014 [N], Turan's minnow/-/Orontes River drainage. (Küçük & Güçlü 2014)
- Pseudophoxinus zekayi* Bogutskaya, Küçük & Atalay, 2006 [E], Ceyhan spring minnow/-/Ceyhan River Basin. (Bogutskaya et al. 2006)
- Pseudophoxinus zeregi* (Heckel, 1843) [N], Orontes phoxinellus/Incilevrek balığı/Orontes Rives Basin. (Geldiay & Balık 2007, Fricke et al. 2007)
- Rutilus frisii* (Nordmann, 1840) [N], Kutum/Levkit balığı/Black Sea and Sea of Marmara watersheds. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Rutilus rutilus* (Linnaeus, 1758) [N], Roach/Kızılgöz balığı/European Black Sea watersheds. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Scardinius elmaliensis* Bogutskaya, 1997 [E], Antalya rudd/-/Kara Lake, Antalya. (Kuru 2004, Fricke et al. 2007)
- Scardinius erythrophthalmus* (Linnaeus, 1758) [N], Rudd/Kızılkanat/European Black Sea watersheds. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Squalius adanaensis* Turan, Kottelat & Doğan, 2013 [E], Adana chub/-/Seyhan River Basin. (Turan et al. 2013a)
- Squalius anatolicus* (Bogutskaya, 1997) [E], Beyşehir dace/-/Beyşehir Lake. (Kuru 2004, Fricke et al. 2007)
- Squalius aristotelis* Özuluğ & Freyhof, 2011 [E], Tuzla chub/-/Western Anatolia. (Özuluğ & Freyhof 2011a)
- Squalius berak* Heckel, 1843 [N], Mesopotamian chub/-/Lower Euphrates River Basin. (Turan et al. 2013a)
- Squalius borysthenicus* (Kessler, 1859) [N], Dnjepr chub/Tatlısu kefalı/Black Sea and Sea of Marmara watersheds. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Squalius cappadocicus* Özuluğ & Freyhof, 2011 [E], Cappadocian chub/-/Melendiz River in Lake Tuz Basin. (Özuluğ & Freyhof 2011a)
- Squalius carinus* Özuluğ & Freyhof, 2011 [E], Chocolate chub/-/Isikli Lake watersheds. (Özuluğ & Freyhof 2011a)
- Squalius cephaloides* (Battalgil, 1942) [E], Thick lipped chub/-/Northern Armutlu Peninsula. (Özuluğ & Freyhof 2011a)
- Squalius cephalus* (Linnaeus, 1758) [N], European chub/Tatlısu kefalı/Western Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Squalius cii* (Richardson, 1857) [N], European chub/Tatlısu kefalı/Northwestern Anatolian watersheds. (Stoumboudi et al. 2006)
- Squalius fellowesii* (Günther, 1868) [E], Aegean chub/-/Southwestern Anatolia. (Turan et al. 2009b)
- Squalius kosswigi* (Karaman, 1972) [E], -/-/Tahtalı River, İzmir. (Turan et al. 2009b)
- Squalius kottelati* Turan, Yılmaz & Kaya, 2009 [E], Striped chub/-/Orontes, Euphrates and Tigris river basins. (Turan et al. 2009b)
- Squalius lepidus* Heckel, 1843 [N], Tigris dace/Akbalık/Orontes, Euphrates and Tigris river basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Squalius orientalis* (Nordmann 1840) [N], Dace/-/Eastern Anatolia, Aras River Basin. (Geldiay & Balık 2007)
- Squalius orpheus* Kottelat & Economidis, 2006 [N], Orpheus dace/-/European Black Sea watersheds. (Kottelat & Economidis 2006)
- Squalius pursakensis* (Hankó, 1925) [E], Sakarya chub/-/Sakarya River Basin. (Turan et al. 2009b)
- Squalius recurvirostris* Özuluğ & Freyhof, 2011 [E], Akşehir chub/-/Eber, Akşehir and Ilgın Lakes watersheds. (Özuluğ & Freyhof 2011a)
- Squalius seyhanensis* Turan, Kottelat & Doğan, 2013 [E], Seyhan dace/-/Zamantı Stream, upper Seyhan River Basin. (Turan et al. 2013a)
- Squalius spurius* Heckel, 1843 [N], Orontes dace/-/Orontes River Basin. (Kuru 2004, Fricke et al. 2007)
- Squalius turcicus* De Filippi, 1865 [E], Transcaucasian chub/-/Kura-Aras River Basin. (Doadrio & Carmona 2006)
- Vimba melanops* (Heckel, 1839) [N], Macedonian vimba/-/Northwestern Anatolia. (Kuru 2004, Fricke et al. 2007)
- Vimba mirabilis* (Ladiges, 1960) [E], Menderes bream/Ulubat balığı/Büyük Menderes River Basin. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Vimba vimba* (Linnaeus, 1758) [N], Baltic vimba/Eğrez, karaburun balığı/European Black Sea watersheds. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)

Subfamily DANIONINAE

Barilius mesopotamicus Berg, 1932 [N], Mesopotamian

- minnow/-/Euphrates and Tigris river basins. (Kuru 2004, Fricke et al. 2007)
- Family COBITIDAE**
- Subfamily COBITINAE**
- Cobitis battalgili* **Bacescu, 1962** [E], Battalgil spined loach/Taşıyien balığı/southwestern part of central Anatolia. (Erk'akan & Özdemir 2014)
- Cobitis bilseli* **Battalgil, 1942** [E], Beyşehir spined loach/Koca taşıyien balığı/Beyşehir Lake, southwestern part of central Anatolia. (Geldiy & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Cobitis damlae* **Erk'akan & Özdemir, 2014** [E], Dalaman spined loach/Taşıyien balığı/Dalaman River drainage, Burdur. (Erk'akan & Özdemir 2014)
- Cobitis elazigensis* **Coad & Sarieyyüpoğlu, 1988** [N], Tigris spined loach/Taşıyien balığı/Euphrates and Tigris river basins. (Kuru 2004, Fricke et al. 2007)
- Cobitis evreni* **Erk'akan, Özeren & Nalbant, 2008** [E], Ceyhan spined loach/Taşıyien balığı/Kömür Stream, upper Ceyhan River Basin. (Erk'akan et al. 2008a)
- Cobitis fahirae* **Erk'akan, Atalay-Ekmekçi & Nalbant, 1998** [E], Küçük Menderes spined loach/Taşıyien balığı/Aegean Sea watersheds. (Erk'akan et al., 1998; Geldiy & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Cobitis kellei* **Erk'akan, Atalay-Ekmekçi & Nalbant, 1998** [E], Göksü spined loach/Taşıyien balığı/Göksü watershed, Tigris River Basin. (Erk'akan et al., 1998; Geldiy & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Cobitis levantina* **Krupp & Moubayed, 1992** [N], Orontes spined loach/Taşıyien balığı/Orontes River Basin. (Geldiy & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Cobitis phrygica* **Battalgazi, 1944** [E], Aci spined loach/Taşıyien balığı/Aciğöl, Burdur, Salda and Sögüt lakes watersheds, Burdur. (Kuru 2004, Fricke et al. 2007)
- Cobitis pontica* **Vasil'eva & Vasil'ev, 2006** [N], Pontic spined loach/Taşıyien balığı/European Black Sea, Sea of Marmara watersheds. (Vasil'eva & Vasil'ev 2006, Kottelat & Freyhof 2007)
- Cobitis punctulata* **Erk'akan, Atalay-Ekmekçi & Nalbant, 1998** [E], Spotted spined loach/Taşıyien balığı/Kuş Lake, Balıkesir. (Erk'akan et al., 1998; Geldiy & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Cobitis simplicispina* **Hankó, 1925** [E], Sakarya spined loach/Taşıyien balığı/Some tributaries of Sakarya River Basin, western parts of central Anatolia. (Geldiy & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Cobitis splendens* **Erk'akan, Atalay-Ekmekçi & Nalbant, 1998** [E], Splendid spined loach/Taşıyien balığı/Western Black Sea coastal watersheds of Anatolia. (Erk'akan et al., 1998; Geldiy & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Cobitis strumicae* **Karaman, 1955** [N], Bulgarian spined loach/Taşıyien balığı/European Black Sea watersheds. (Geldiy & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Cobitis turcica* **Hankó, 1925** [N], Turkish spined loach/Taşıyien balığı/Central Anatolia. (Geldiy & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Cobitis vardarensis* **Karaman, 1928** [N], Vardar spined loach/Taşıyien balığı/Iznik Lake and European Black Sea watersheds. (Geldiy & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Misgurnus fossilis* **(Linnaeus, 1758)** [N], Weatherfish/-/European Black Sea watersheds. (Fricke et al. 2007)
- Sabanejewia aurata* **(De Filippi, 1863)** [N], Golden spined loach/Taşıyien/Kura-Aras River Basin. (Geldiy & Balık 2007)
- Sabanejewia balcanica* **(Karaman, 1922)** [N], Balcan spined loach/-/European Black Sea watersheds. (Fricke et al. 2007) Treated as *Sabanejewia aurata* by authors (e.g. Nalbant & Bianco 1998)
- Sabanejewia caspia* **(Eichwald, 1838)** [N], Caspian spined loach/-/Kura-Aras River Basin. (Fricke et al. 2007)
- Family NEMACHEILIDAE**
- Barbatula barbatula* **(Linnaeus, 1758)** [N], Stone loach/-/Black Sea watersheds. (Kuru 2004, Fricke et al. 2007)
- Oxynoemacheilus anatolicus* **Erk'akan, Özeren & Nalbant, 2008** [E], Burdur loach/-/Inlet of Karamanli Dam Lake, Burdur. (Erk'akan et al. 2008b)
- Oxynoemacheilus angorae* **(Steindachner, 1897)** [N], Angora loach/Çamur balığı/Central, northern and eastern Anatolia. (Kuru 2004, Fricke et al. 2007)
- Oxynoemacheilus araxensis* **(Banarescu & Nalbant, 1978)** [E], Aras loach/-/Kura-Aras, Tigris and Euphrates rivers basins. (Kuru 2004, Fricke et al. 2007)
- Oxynoemacheilus argyrogramma* **(Heckel, 1847)** [N], Two spot loach/Çöpçü balığı/Euphrates and Tigris river basins. (Kuru 2004)
- Oxynoemacheilus atili* **Erk'akan, 2012** [E], Lake Beyşehir loach/Çöpçü balığı/Eflatun Pınarı, Beyşehir Lake. (Erk'akan 2012)
- Oxynoemacheilus banarescui* **(Delmastro, 1982)** [E], Paphlagonian sportive loach/-/Central Black Sea watersheds. (Kuru 2004)
- Oxynoemacheilus brandtii* **(Kessler, 1877)** [N], Kura loach/Çöpçü balığı/Kura River Basin. (Kuru 2004, Fricke et al. 2007)
- Oxynoemacheilus bureschi* **(Drensky, 1928)** [N], Bulgarian stone loach/Çöpçü balığı/Black Sea watersheds. (Fricke et al. 2007)
- Oxynoemacheilus ceyhanensis* **(Erk'akan, Nalbant & Özeren, 2007)** [E], Elbistan loach/Çöpçü balığı/Ceyhan River Basin. (Erk'akan et al. 2007)
- Oxynoemacheilus cinicus* **(Erk'akan, Nalbant & Özeren, 2007)** [E], -/Çöpçü balığı/Cin Stream, Kütahya to Denizli. (Erk'akan et al. 2007)
- Oxynoemacheilus cyri* **(Berg, 1910)** [E], Göle loach/Çöpçü balığı/Upper Kura River Basin. (Fricke et al. 2007)
- Oxynoemacheilus ercisanus* **(Erk'akan & Kuru, 1986)** [E], Van loach/Çöpçü balığı/Van Lake Basin. (Freyhof et al. 2011, Kottelat 2012)
- Oxynoemacheilus irdali* **(Erk'akan, Nalbant & Özeren, 2007)** [E], -/Çöpçü balığı/Murat River, Tigris River Basin. (Erk'akan et al. 2007)
- Oxynoemacheilus eregliensis* **(Banarescu & Nalbant, 1978)** [E], Central Anatolian loach/Çöpçü balığı/Eregli, Konya. (Kuru 2004)
- Oxynoemacheilus evreni* **(Erk'akan, Nalbant & Özeren, 2007)** [E], Ceyhan sportive loach/Çöpçü balığı/Tekir stream, Ceyhan River Basin. (Erk'akan et al. 2007)
- Oxynoemacheilus frenatus* **(Heckel, 1843)** [N], Banded Tigris loach/Çöpçü balığı/Euphrates and Tigris river basins. (Kuru 2004, Fricke et al. 2007)
- Oxynoemacheilus germencicus* **(Erk'akan, Nalbant & Öz**

- eren, 2007** [E], Carian loach/Çöpçü balığı/Germencik, Aydın. (Erk'akan et al. 2007)
- Oxynoemacheilus insignis (Heckel, 1843)** [N], Syrian loach/Çöpçü balığı/Sünnep Creek, Kilis. (Kuru 2004, Fricke et al. 2007)
- Oxynoemacheilus kaynaki Erk'akan, Özeren & Nalbant, 2008** [E], Melid loach/Çöpçü balığı/Göksu River, Euphrates River Basin drainage. (Erk'akan et al. 2008b)
- Oxynoemacheilus kosswigi (Erk'akan & Kuru, 1986)** [E], Paphlagonian loach/Çöpçü balığı/Yildizeli Stream, Sivas. (Erk'akan & Kuru, 1986)
- Oxynoemacheilus mediterraneus (Erk'akan, Nalbant & Özeren, 2007)** [E], Pamphylian loach/Çöpçü balığı/Madenli-Aksu Stream, Eğirdir, Isparta. (Erk'akan et al. 2007)
- Oxynoemacheilus mesudae Erk'akan, 2012** [E], Isiki loach/Çöpçü balığı/Aegean Sea watersheds. (Erk'akan, 2012)
- Oxynoemacheilus namiri (Krupp & Schneider 1991)**[E], Levantine loach/Çöpçü balığı/Orontes River Basin. (Birecikligil & Çiçek 2011)
- Oxynoemacheilus panthera (Heckel, 1843)** [N], Tiger loach/Çöpçü balığı/Eastern Anatolia. (Kuru 2004, Fricke et al. 2007)
- Oxynoemacheilus paucilepis (Erk'akan, Nalbant & Özeren, 2007)** [E], Mancilik dwarf loach/Çöpçü balığı/Mancilik Stream, Sivas. (Erk'akan et al. 2007)
- Oxynoemacheilus phoxinoides (Erk'akan, Nalbant & Özeren, 2007)** [E], Iznik loach/Çöpçü balığı/Iznik. (Erk'akan et al. 2007)
- Oxynoemacheilus samanticus (Banarescu & Nalbant, 1978)** [E], Kizilirmak sportive loach/Çöpçü balığı/Lower Euphrates River Basin. (Kuru 2004)
- Oxynoemacheilus seyhanensis (Banarescu, 1968)** [E], Samanti loach/Çöpçü balığı/Upper Seyhan River Basin. (Kottelat 2012)
- Oxynoemacheilus seyhanicola (Erk'akan, Nalbant & Özeren, 2007)** [E], Cilician loach/Çöpçü balığı/Seyhan River Basin. (Erk'akan et al. 2007)
- Oxynoemacheilus simavicus (Balik & Banarescu, 1978)** [E], Simav loach/Çöpçü balığı/Simav, Kütahya. (Kuru 2004)
- Oxynoemacheilus theophilii Stoumboudi, Kottelat & Barbieri 2006** [N], -/Çöpçü balığı/Madra Creek, Bergama, Izmir. (Erk'akan et al. 2007, Kottelat 2012)
- Oxynoemacheilus tigris (Heckel, 1843)** [N] Tigris loach/Çöpçü balığı/Euphrates and Tigris river basins and eastern Mediterranean watersheds. (Kuru 2004)
- Paracobitis zabgawraensis Freyhof, Esmaili, Sayyadzadeh & Geiger, 2014** [N], Western crested loach/-/Euphrates and Tigris river basins. (Kuru 2004, Fricke et al. 2007 as *P. malapterura*)
- Schistura chrysicristinae Nalbant, 1998** [N], Batman crested loach/-/Batman River, Tigris River Basin. (Fricke et al. 2007)
- Seminemacheilus ispartensis Erk'akan, Nalbant & Özeren, 2007** [E], Southern pond loach/-/Isparta Creek, Isparta. (Erk'akan et al. 2007)
- Seminemacheilus lendlii (Hankó, 1925)** [E], Anatolian loach/Çöpçü balığı/Anatolian Black Sea watersheds and central Anatolia. (Kuru 2004, Fricke et al. 2007)
- Turcinoemacheilus kosswigi Banarescu & Nalbant, 1964** [N], Kosswig's loach/Çöpçü balığı/Euphrates and Tigris river basins. (Kuru 2004)
- Turcinoemacheilus minimus Esmaili, Sayyadzadeh, Özülgü, Geiger & Freyhof, 2014** [N], Ceyhan loach/-/Upper Göksu River, Ceyhan River Basin. (Esmaili et al. 2014a)
- Order CHARACIFORMES**
- Family SERRASALMIDAE**
- Pygocentrus nattereri Kner, 1858** [I], Red piranha/Pirana/Reported from Sakarya Lake. Probably an aquarium released species. (Tarkan 2006)
- Order SILURIFORMES**
- Family BAGRIDAE**
- Mystus pelusius (Solander, 1794)** [N], Tigris mystus/Mezopotamya kedi balığı/Euphrates and Tigris river basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Family SILURIDAE**
- Silurus glanis Linnaeus, 1758** [N], Wels catfish/Yayın balığı/Black Sea watersheds, translocated into some parts of Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Silurus triostegus Heckel, 1843** [N], Tigris catfish/-/Euphrates and Tigris river basins. (Kuru 2004, Fricke et al. 2007)
- Family Sisoridae**
- Subfamily GLYPTOSTERNINAE**
- Glyptothorax armeniacus (Berg, 1918)** [N], Armenian mountain cat/Iğneli küçük yayın balığı/Eastern and southeastern Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Glyptothorax cous (Linnaeus, 1766)** [N], Tigris cat/-/Euphrates and Tigris river basins. (Kuru 2004, Fricke et al. 2007, Coad 2015). Apparently the same as *Arius cous* Hyrtl, 1859.
- Glyptothorax kurdistanicus (Berg, 1931)** [N], Iran cat/Vantuzlu yayın balığı/ Euphrates and Tigris river basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Glyptothorax steindachneri (Pietschmann, 1913)** [N], Steindachner's cat/-/Euphrates and Tigris river basins. (Kuru 2004, Fricke et al. 2007, Coad 2015)
- Family CLARIIDAE**
- Clarias gariepinus Burchell, 1822** [N], North African catfish/Karabalık, sekiz bıyık/Southern Anatolia and translocated some other parts of Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Family HETEROPNEUSTIDAE**
- Heteropneustes fossilis (Bloch, 1794)** [I], Stinging catfish/-/Reported from Tigris River (Ünlü et al. 2011).
- Family LORICARIIDAE**
- Pterygoplichthys disjunctivus (Weber, 1991)** [I], Vermiculated sailfin catfish/-/Reported from Orontes River. (Yalçın Özdilek 2007).
- Order ESOCIFORMES**
- Family ESOCIDAE**
- Esox lucius Linnaeus, 1758** [N], Northern pike/Turna balığı/Black Sea and central Anatolian lake watersheds and introduced widespread to Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)
- Order SALMONIFORMES**
- Family SALMONIDAE**
- Subfamily COREGONINAE**
- Coregonus macrophthalmus Nüsslin, 1882** [I], Gangfisch/-/Introduced to Black Sea watersheds. (Geldiay & Balık

2007)

Coregonus wartmani (Bloch, 1784) [I], Blaufelchen/-/Introduced to Black Sea watersheds. (Geldiay & Balık 2007, Kuru 2004 as *C. lavaretus*)

Stenodus leucichthys (Güldenstädt, 1772) [ExT], Sheefish/-/Kura-Aras River Basin. (Fricke et al. 2007)

Subfamily SALMONINAE

Oncorhynchus mykiss (Walbaum, 1792) [I], Rainbow trout/Gökkuşluğu alabalığı/Main culture fish in freshwater both rives and dams, introduced to all parts of Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)

Salmo abanticus Tortonese, 1954 [E], -/Abant alası/Abant Lake, introduced to Black Sea watersheds. (Geldiay & Balık 2007, Kuru 2004)

Salmo caspius Kessler, 1877 [N], Caspian trout/Hazar alası/Kura-Aras River Basin. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)

Salmo chilo Turan, Kottelat & Engin, 2012 [E], Chilo trout/-/Upper Ceyhan River Basin (Turan et al. 2012b).

Salmo coruhensis Turan, Kottelat & Engin, 2010 [E], Coruh trout/-/Eastern Anatolia Black Sea watersheds (Turan et al. 2010).

Salmo euphrataeus Turan, Kottelat & Engin, 2014 [E], Euphrates trout/-/Northeastern tributaries of Euphrates River (Turan et al. 2014b).

Salmo kottelati Turan, Doğan, Kaya & Kanyılmaz, 2014 [E], Antalya trout/-/Alakır Stream, Antalya. (Turan et al. 2014c)

Salmo labecula Turan, Kottelat & Engin, 2012 [E], Seyhan trout/-/Seyhan River drainage. (Turan et al. 2012b)

Salmo labrax Pallas, 1814 [N], Black Sea salmon/Alabalık, denizalası/Black Sea and adjacent watersheds. (Geldiay & Balık 2007, Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)

Salmo okumusi Turan, Kottelat & Engin, 2014 [E], Okumus trout/-/Western tributaries of Euphrates River. (Turan et al. 2014b)

Salmo optimus Turan, Kottelat & Engin, 2012 [E], Opimus trout/-/Ceyhan River tributaries and Alara Stream, Antalya. (Turan et al. 2012b)

Salmo platycephalus Behnke, 1968 [E], Flathead trout/Zamantı alası/Upper part of Seyhan River Basin. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)

Salmo rizeensis Turan, Kottelat & Engin, 2010 [E], Rize trout/-/Eastern Anatolia Black Sea watersheds. (Turan et al. 2010)

Salmo salar Linnaeus, 1758 [I], Atlantic salmon/Somon/-/Introduced for salmon farming in Black Sea, not established in wild. (Kuru 2004, Fricke et al. 2007, Innal & Erk'akan 2006)

Salmo tigridis Turan, Kottelat & Bektaş, 2011 [E], Tigris trout/-/Upper tributaries of Tigris River Basin. (Turan et al. 2011)

Salmo trutta Linnaeus, 1758 [I], Brown trout/Alabalık/Introduced in Sea of Marmara, Aegean and Mediterranean Sea watersheds. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)

Salvelinus alpinus (Linnaeus, 1758) [I], Arctic char/-/Introduced to Black Sea watersheds. (Geldiay & Balık 2007, Tarkan et al. 2015)

Salvelinus fontinalis (Mitchill, 1814) [I], American brook

trout/Kaynak alabalığı/Introduced to Black Sea watersheds. (Geldiay & Balık 2007, Tarkan et al. 2015)

Order ATHERINIFORMES

Family ATHERINIDAE

Subfamily ATHERININAE

Atherina boyeri Risso, 1810 [N], Big-scale sand smelt/Gümüş balığı/All coasts of Anatolian brackish waters, widespread to lakes some parts of Anatolia. (Geldiay & Balık 2007, Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)

Atherina hepsetus Linnaeus, 1758 [N], Mediterranean sand smelt/Çamuka balığı/All coasts of Anatolian brackish waters, marginally entering freshwater habitats. (Bilecenoğlu et al. 2002, Fricke et al. 2007, Bilecenoğlu et al. 2014)

Order CYPRINODONTIFORMES

Family POECILIIDAE

Subfamily POECILIINAE

Gambusia holbrooki Girard, 1859 [I], Holbrook's mosquitofish/Sivrisinek balığı/Introduced and widespread into Anatolia to provide biological control for mosquitoes. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)

Family CYPRINODONTIDAE

Subfamily CYPRINODONTINAE

Aphanius anatoliae (Leidenfrost, 1912) [E], Anatolian giant killifish/Dişli sazancık balığı/Lakes and wetlands in western and central Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007) *Aphanius meridionalis* Akşiray, 1948 from Sögüt Lake has been treated as a junior synonym of this species by authors.

Aphanius asquamatus (Sözer, 1942) [N], Scaleless killifish/Dişli sazancık balığı/Eastern Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)

Aphanius danfordii (Boulenger, 1890) [E], Danford's killifish/Dişli sazancık/Wetlands in central Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)

Aphanius fasciatus (Valenciennes, 1821) [N], Mediterranean banded killifish/Dişli sazancık/Sea of Marmara, Aegean and Mediterranean Sea watersheds. (Geldiay & Balık 2007, Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007)

Aphanius fontinalis Akşiray, 1948 [E], Burdur killifish/Dişli sazancık/Yarışlı and Burdur Lakes, Burdur. (Pfleiderer et al. 2014)

Aphanius icoii Akşiray, 1948 [E], Konya killifish/Dişli sazancık/Konya province, Central Anatolia. (Pfleiderer et al. 2014)

Aphanius maeandricus Akşiray, 1948 [E], Maeander killifish/-/Springs near source of Büyük Menderes River, southwestern Anatolia. (Pfleiderer et al. 2014)

Aphanius marassantensis Pfleiderer, Geiger & Herder, 2014 [E], Kızılırmak killifish/-/Kızılırmak River Basin. (Pfleiderer et al. 2014)

Aphanius mento (Heckel, 1843) [N], Pearl-spotted killifish/Dişli sazancık balığı/Orontes, Seyhan and Ceyhan river basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)

Aphanius saldae Akşiray, 1955 [E], Salda killifish/Dişli sazancık/Salda Lake, Burdur. (Pfleiderer et al. 2014)

Aphanius splendens (Kosswig & Sözer, 1945) [E], Splendid killifish/-/Lake Gölçük, central Anatolia. (Parenti 2002)

Aphanius sureyanus (Neu, 1937) [E], Sureyan killifish/Dişli sazancık/Burdur Lake, central Anatolia. (Kuru 2004, Fricke

et al. 2007)

Aphanius transgrediens (Ermin, 1946) [E], Acipinar killifish/Dişli sazancık/Acıgöl Lake, Burdur. (Kuru 2004, Fricke et al. 2007)

Aphanius villwocki Hrbek & Wildekamp, 2003 [E], Villwock's killifish/Dişli sazancık /Sakarya River Basin. (Kuru 2004)

Order GASTEROSTEIFORMES

Family GASTEROSTEIDAE

Gasterosteus aculeatus Linnaeus, 1758 [N], Three-spined stickleback/Dikence balığı/Western Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)

Pungitius platygaster (Kessler, 1859) [N], Southern nine-spine stickleback/Uzun dikence balığı/European Black Sea watersheds. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)

Order SYNGNATHIFORMES

Family SYNGNATHIDAE

Subfamily SYNGNATHINAE

Nerophis ophidion (Linnaeus, 1758) [N], Straight-nose pipefish/Deniz iğnesi/All coasts of Anatolian brackish waters, entering freshwater habitats. (Geldiay & Balık 2007, Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)

Syngnathus abaster Risso, 1827 [N], Blackstripe pipefish/Iğne balığı, deniziğnesi balığı/All coasts of Anatolian watersheds. (Geldiay & Balık 2007, Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)

Order SYNBRANCHIFORMES

Family MASTACEMBELIDAE

Mastacembelus mastacembelus (Banks & Solander in Russell, 1794) [N], Euphrates spiny eel/Dikenli yılanbalığı/Euphrates and Tigris river basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)

Order PERCIFORMES

Family MORONIDAE

Dicentrarchus labrax (Linnaeus, 1758) [N], European seabass/Levrek balığı/All coasts of Anatolian brackish waters. (Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)

Dicentrarchus punctatus (Bloch, 1792) [N], Spotted seabass/Levrek balığı/Mediterranean and Aegean Sea coasts of Anatolian brackish waters, entering freshwater habitats. (Bilecenoğlu et al. 2002, Fricke et al. 2007, Bilecenoğlu et al. 2014)

Morone chrysops (Rafinesque, 1820) X *Morone saxatilis* (Walbaum, 1792) [I], Hybrid striped bass/Ak levrek X Çizgili levrek melezi/Kemer Dam Lake, Aydın. (Geldiay & Balık 2007)

Family CENTRARCHIDAE

Lepomis gibbosus Linnaeus, 1758 [I], Pumpkinseed/Güneş levreği/Introduced and spreading to western Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)

Family PERCIDAE

Subfamily PERCINAE

Gymnocephalus cernua (Linnaeus, 1758) [N], Ruffe/-/European Black Sea watersheds. (Kuru 2004, Fricke et al. 2007)

Perca fluviatilis Linnaeus, 1758 [N], European perch/Tatlısu levreği/Northwestern parts of Anatolia, introduced into some lakes in Anatolia. (Geldiay & Balık

2007, Kuru 2004, Fricke et al. 2007)

Subfamily LUCIOPERCINAE

Sander lucioperca (Linnaeus, 1758) [N], Zander/Sudak/Northwestern parts of Anatolia, widely introduced into other parts of Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)

Sander volgensis (Gmelin, 1789) [I], Zander/Uzun levrek/introduced into some parts of Anatolia. (Freyhof 2013)

Family MUGILIDAE

Chelon labrosus (Risso, 1827) [N], Thicklip grey mullet/Kefal, mavraki/All coasts of Anatolian brackish waters. (Geldiay & Balık 2007, Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)

Chelon saliens (Risso, 1810) [N], Leaping mullet/Kefal, kokar balığı, kastros/All coasts of Anatolian brackish waters. (Geldiay & Balık 2007, Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)

Liza carinata (Valenciennes, 1836) [LI], Keeled mullet/Bıldırın kefal/Mediterranean coasts of Anatolian brackish waters. (Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)

Liza haematocheila (Temminck & Schlegel, 1845) [I], So-iuy mullet/Rus kefali/Introduced into Russian part of the Sea of Azov and dispersed through Black Sea, Sea of Marmara and northern Aegean Sea brackish waters. (Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)

Liza ramada (Risso, 1827) [N], Thinlip mullet/Pulatarina balığı, ceran/All coasts of Anatolian brackish waters. (Geldiay & Balık 2007, Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)

Mugil cephalus Linnaeus, 1758 [N], Flathead mullet/Haskefal, topan kefal/All coasts of Anatolian brackish waters. (Geldiay & Balık 2007, Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)

Oedalechilus labeo (Cuvier, 1829) [N], Boxlip mullet/Dudaklı kefal/Estuaries in Sea of Marmara, Aegean Sea and Mediterranean Sea watersheds, entering freshwater habitats. (Geldiay & Balık 2007, Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)

Planiliza abu (Heckel, 1843) [N], Abu mullet/Kefal/Euphrates and Tigris river basins. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)

Planiliza aurata (Risso, 1810) [N], Golden grey mullet/Altınbaş kefal/All coasts of Anatolian brackish waters. (Geldiay & Balık 2007, Bilecenoğlu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoğlu et al. 2014)

Family CICHLIDAE

Subfamily PSEUDOCRENILABRINAE

Cichlid species given below had been imported into Turkey by universities as part of government authorized research programmes (Tarkan et al. 2015) and they that have escaped from aquaculture facilities and probably interbreed and form hybrids in natural environment. Because of hybridization it is not easy to exact species identification of the specimens caught from wild.

Coptodon rendalli (Boulenger, 1897) [I], Redbreast tilapia/İsrail çipurası, tatlı su çipurası, tilapya/Introduced into southern Anatolia. (Geldiay & Balık 2007, Innal, 2012)

Coptodon zillii (Gervais, 1848) [I], Redbelly tilapia/Israill çipurası, tatlı su çipurası, tilapya/Introduced into southern Anatolia. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007, Innal, 2012)

Oreochromis aureus (Steindachner, 1864) [I], Blue tilapia/Israill çipurası, tatlı su çipurası, tilapya/Introduced into southern Anatolia. (Geldiay & Balık 2007, Fricke et al. 2007, Innal 2012)

Oreochromis mossambicus (Peters, 1852) [I], Mozambique tilapia/Israill çipurası, tatlı su çipurası, tilapya/Introduced into southern Anatolia. (Geldiay & Balık 2007, Innal 2012)

Oreochromis niloticus (Linnaeus, 1758) [I], Nile tilapia/Israill çipurası, tatlı su çipurası, tilapya/Introduced into southern Anatolia. (Geldiay & Balık 2007, Fricke et al. 2007, Innal 2012)

Sarotherodon galilaeus (Linnaeus, 1758) [I], Mango tilapia/Tilapya/Introduced into southern Anatolia. (Innal 2012)

Family BLENNIIDAE

Subfamily SALARIINAE

Salaria fluviatilis Assoy del Rio, 1801 [N], Freshwater blenny/Tatlısu horozbinası/Mediterranean, Marmara and Aegean seas watersheds. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)

Salaria pavo (Risso, 1810) [N], Peacock blenny/Horozbina/ Anatolian coastal watersheds, entering brackish and freshwater habitats. (Bilecenoglu et al. 2002, Fricke et al. 2007, Bilecenoglu et al. 2014)

Family GOBIIDAE

Subfamily GOBIINAE

Babka gymnotrachelus (Kessler, 1857) [N], Racer goby/Küçük kayabalığı/Black Sea watersheds. (Geldiay & Balık 2007, Kuru 2004, Fricke et al. 2007)

Benthophilus nudus Berg, 1898 [N], Black Sea tadpole-goby/Iribaş kayabalığı/Black Sea watersheds. [Miller, 1986 as *B. stellatus* (non Sauvage, 1874), Kottelat & Freyhof 2007]

Knipowitschia caucasica (Berg, 1916) [N], Caucasian goby/Kayabalığı/Marmara, Aegean and Black seas watersheds, introduced into Eğirdir Lake. (Bilecenoglu et al. 2002, Fricke et al. 2007, Bilecenoglu et al. 2014)

Knipowitschia ephesi Ahnelt, 1995 [E], Ephesus goby/-/Büyük Menderes River Basin. (Fricke et al. 2007)

Knipowitschia longicaudata (Kessler, 1877) [N], Longtail goby/-/Black Seas watersheds. (Kuru 2004, Fricke et al. 2007)

Knipowitschia mermere Ahnelt, 1995 [E], Marmara goby/Mermer kayabalığı/Sea of Marmara watersheds. (Kuru 2004, Fricke et al. 2007)

Mesogobius batrachocephalus (Pallas, 1814) [N], Knout goby/Kurbağakayası balığı, yassıkafa kayabalığı/Black Sea and Sea of Marmara watersheds. (Geldiay & Balık 2007, Bilecenoglu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoglu et al. 2014)

Neogobius fluviatilis (Pallas, 1814) [N], Monkey goby/Tatlısu kayası balığı/Black Sea watersheds. (Geldiay & Balık 2007, Fricke et al. 2007)

Neogobius melanostomus (Pallas, 1814) [N], Round goby/Kocabaşkaya balığı, kum kayabalığı/Aegean, Marmara and Black Sea watersheds. (Geldiay & Balık 2007, Bilecenoglu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoglu et al. 2014)

Ponticola constructor (Nordmann, 1840) [N], Blackbelly river goby/Kaya balığı/Eastern Black Sea watersheds. (Kuru 2004, Fricke et al. 2007)

Ponticola cyrius (Kessler, 1874) [N], Kura goby/Kaya balığı/Kura-Aras River Basin. (Fricke et al. 2007)

Ponticola eurycephalus (Kessler, 1874) [N], Mushroom goby/Kayabalığı/Black Sea watersheds. (Bilecenoglu et al. 2002, Fricke et al. 2007, Bilecenoglu et al. 2014)

Ponticola platyrostris (Pallas, 1814) [N], Flatsnout goby/Sarı kayabalığı/Eastern Black Sea watersheds of Anatolia. (Geldiay & Balık 2007, Fricke et al. 2007, Bilecenoglu et al. 2014)

Ponticola ratan (Nordmann, 1840) [N], Ratan goby/Kayabalığı/Black Sea and Sea of Marmara watersheds. (Geldiay & Balık 2007, Bilecenoglu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoglu et al. 2014)

Ponticola rizensis (Kovacic & Engin, 2008) [E], Iyidere goby/Kayabalığı/Iyidere Stream drainage, northeastern Black Sea. (Kovacic & Engin 2008)

Ponticola syrman (Nordmann, 1840) [N], Syrman goby/Kayabalığı/Black Sea and Sea of Marmara watersheds. (Bilecenoglu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoglu et al. 2014)

Ponticola turani (Kovacic & Engin, 2008) [E], Aksu goby/Kaya balığı/Aksu Stream, northeastern Black Sea. (Kovacic & Engin 2008)

Proterorhinus semilunaris (Heckel, 1839) [N], Western tubenose goby/Kaya balığı/European Black Sea, northern Aegean Sea and Sea of Marmara watersheds. (Kuru 2004, Fricke et al. 2007 as *P. marmoratus* (non Pallas 1814), Kottelat & Freyhof 2007)

Order PLEURONECTIFORMES

Family SCOPHTHALMIDAE

Scophtthalmus maeoticus (Pallas, 1814) [N], Black Sea brill/Kalkan/Black Sea coasts brackish waters, entering freshwater habitats. (Kuru 2004, Fricke et al. 2007, Bilecenoglu et al. 2014).

Family PLEURONECTIDAE

Subfamily PLEURONECTINAE

Platichthys luscus (Pallas, 1814) [N], Mediterranean flounder/Derepisisi/All coasts of Anatolian brackish waters. (Geldiay & Balık 2007, Bilecenoglu et al. 2002, Kuru 2004, Fricke et al. 2007, Bilecenoglu et al. 2014).

Discussion

Based on the presented checklist of this study, we are documented the presence of a total of 368 fish species (plus 10 questionable species) from the inland waters of Turkey. The confirmed freshwater fishes of Turkey comprise 368 species in 104 genera, 31 families, 16 orders and 2 classes. Compared with the last published checklist of freshwater fish of Turkey (261 species) (Fricke et al. 2007), the present checklist shows an increase in species number of 41% (107 species). This increase has resulted mainly from new species records and taxonomic re-evaluations of existing taxa on the basis of new information and adoption of a new systematic concept. Some species that were probably missed out accidentally from previous checklists added have been in the present study. For example in the previous checklists (Geldiay & Balık

2007, Kuru 2004, Fricke et al. 2007) missed the species *Oxynoemacheilus ercisianus* which was reported by Erk'akan and Kuru (1986) from Lake Van Basin.

Habitat degradation, pollution, introduction of non-native fishes and many anthropological influences upon nature are the main threats to this unique ichthyofauna of Turkey (Tarkan et al. 2015). Hence there are many causes for the extinction of some freshwater fish species in Turkey. *Crossocheilus caudomaculatus*, a formerly endemic species of Amik Lake, is now globally extinct caused by the drying of the lake. *Alburnus akili* and *Pseudophoxinus handlirschi* are endemic species restricted to Lake Beyşehir and Lake Eğirdir, respectively. *Sander lucioperca* is a translocated species which was introduced into these lakes by governmental organizations in 1955 (Küçük 2012). Following that introduction, both *A. akili* and *P. handlirschi* became globally extinct due to the piscivorous behaviour of *S. lucioperca*.

Some species, including *Caspiomyzon wagneri*, *Acipenser persicus*, *A. sturio* and *A. caspia* are endemic in the Black and Caspian Sea basins, and had been listed for the freshwater ichthyofauna of Turkey in previous checklists. Those species, as well as the Caspian Sea population of *Stenodus leucichthys*, have seen a sharp decline after the construction of dams in the Caspian Sea watershed including the Kura and Aras rivers (Fricke et al. 2007, Freyhof & Kottelat 2008). These species are extinct in Turkey due to the construction of dams which have cut off the fish migration routes, and the change of their reproductive environments. *Salmo salar* is naturally distributed in temperate and Arctic zones in the Northern Hemisphere including the Black Sea coasts of Anatolia (Kottelat & Freyhof 2007). Though the species is extinct in the wild, it was re-introduced in Black Sea for aquaculture (Inal, 2012, Tarkan et al. 2015).

In this study, some records were disregarded and excluded from Turkey's freshwater ichthyofauna even listed in previous checklists (Kuru 2004, Geldiay & Balık 2007, Fricke et al. 2007) as discussed below.

Gambusia affinis (Baird & Girard, 1853) is an invasive species reported from many parts of Anatolia and listed in the previous studies (Kuru 2004, Geldiay & Balık 2007, Fricke et al. 2007) and also *G. holbrooki* was reported from Turkey in recent years. Both *G. affinis* and *G. holbrooki* were reported from Europe. However, only presence of *G. holbrooki* could be confirmed recently according to the result from genetic studies (Vidal 2010). This species probably has been confused with *G. holbrooki* and it needs further study to validate the occurrence of *G. affinis* into inland waters of Turkey.

Squalius ghigii (Gianferrari, 1927) inhabits into Rhodos Island, Greece (Kottelat & Freyhof 2007). The species misidentified from Turkey and the records from Turkey refer to *L. irideus* and *L. mermere* (Bogutskaya, 1996).

Alburnus albidus was reported from Sapanca Lake (Özuluğ et al. 2007). However this report probably misidentified and confused with *A. alburnus* (Fricke et al. 2007).

Salmo macrostigma (Duméril, 1858) has been reported as *S. macrostigma* or *S. trutta macrostigma* from many parts of Turkey (e.g. Basusta et al. 2014) and listed in some previous checklists (Kuru 2004, Geldiay & Balık 2007). Recent studies showed that the range of *S. macrostigma* is restricted to Algeria (Delling & Doadrio 2005, Kottelat & Freyhof 2007).

The distribution ranges of *Gobio gobio* (Linnaeus, 1758)

and *Barbus barbus* (Linnaeus, 1758) do not include Turkey (Kottelat & Freyhof 2007). The latter species has been split into many taxa the Turkish records are based on *Barbus bergi*.

Alosa braschnikowi (Heckel, 1843) listed in previous was listed in the previous checklist as *Rutilus sojuchbulagi* (Fricke et al. 2007). However distribution range of the species is brakcish waters of Caspian Sea and nonanadrom species (Afraei Bandpei et al. 2012). Therefore the species can not reach Turkish waters.

Romanogobio persus is endemic species to Orumiyeh Lake (Iran) (Coad, 2006). That's why these species are listed or defined incorrectly in Turkey.

Although *Ponticola kessleri* (Günther, 1861) was listed in previous checklists (Kuru 2004, Fricke et al. 2007); this species is naturally distributed in the northern parts of the Black Sea, not including the Black Sea coasts of Anatolia (Kottelat & Freyhof 2007). Indeed the species has not been listed in the checklist of the marine fishes of Turkey (Bilecenoglu et al. 2002, 2014). The Turkish record seems to be based on a misidentification.

According to Eschmeyer and Fricke (2015) some species which were synonymised are also excluded from the checklist. *Orthrias tschaiyssuensis* and *O. euphraticus* are synonyms of *Oxynoemacheilus argyrogramma*; *Barbatula pulsiz* is a junior synonym of *Oxynoemacheilus ercisianus*; *Alburnus pallidus* is a junior synonym of *A. sellal*; *Rutilus heckelii* is a synonym of *R. rutilus*; *R. kutum* is a synonym of *R. frisii*; *Barbatula bergamensis* is a synonym of *Orthrias theophilii*; *Cobitis kurui* is a synonym of *Cobitis vardarensis*; *Aphanius burdurensis* is a synonym of *A. sereyanus*; *Aphanius chantrei* and *A. splendens* are synonym of *A. anatoliae*.

Alburnus schischkovi (Drensky, 1943) was previously considered as a junior synonym of *Alburnus mento* (Heckel, 1837) by (Parin et al. 2014), and reported from European parts of Turkey (Kottelat & Freyhof 2007). However distributions range of *A. mento* is now restricted to some parts of Germany and Austria (Kottelat & Freyhof 2007), and *A. schischkovi* is considered as a valid species.

Some species given below are listed as questionable in this study, their presence in Turkish freshwaters needs confirmation.

Pseudophoxinus sojuchbulagi (Abdurakhmanov, 1950) was listed in the previous checklist as *Rutilus sojuchbulagi* (Fricke et al. 2007). The distribution range of the species is now considered as restricted to Azerbaijan (Bogutskaya et al. 2006).

The distribution range of *Phoxinus colchicus* Berg, 1910 is not clear (Naseka 2010), and the historical record from Hopa has not been confirmed yet in recent years (Kottelat & Freyhof 2007). The species is probably restricted to the northeastern Black Sea coasts (Naseka 2010).

Another species, *Gobio caucasicus*, is distributed near the northeastern coasts of Anatolia (Naseka et al. 2006). Although this species is listed as a valid species in FishBase (Froese & Pauly 2015) its status is uncertain in Eschmeyer and Fricke (2015).

Cyprinion tenuiradius is found in the Gulf and Lake Maharlou basins in Iran. The species has been listed from the Aras River system of eastern Turkey by Fricke et al. (2007), this record may be based on a confusion of the modern Aras or Araxes River with the classical Araxes or Kor River of Fars (Coad 2015).

Benthophilus stellatus distributed in Black Sea, Sea of Azov and rivers and estuaries of the Caspian Sea basin (Miller 1986). However, the species has been confused with *Benthophilus nudus* Berg, 1898.

Luciobarbus brachycephalus inhabits in the Caspian and Aral seas and their tributaries. The species reported from lower Kura and Aras rivers in Iran and Azerbaijan (Coad 2015). Its presence in Turkey needs confirmation by specimens.

Hemigrammocapoeta nana (Heckel, 1843) is restricted to Damascus and Jordan River basins, and Qishon River. Previous records from Turkey have been based on misidentified *H. culiciphaga* Pellegrin, 1927.

Acanthobrama tricolor (Lortet, 1883) is now considered as endemic to Syria (Freyhof, 2014). Previous records from Turkey were based on *A. thisbeae* Freyhof & Özüluğ, 2014.

Sabanejewia caucasica (Berg, 1906) has not been reported previously in Turkey. According to some ichthyologist (personnel communications with Dr. Soheil Eagderi and Dr. Hamed Mousavi-Sabet) the species may be distributed in Turkey. However the species was reported as a questionable in Georgia by Reshetnikov et al. (1997).

Introduction and distribution of exotic and translocated species in freshwater habitats in Turkey well evaluated in the previous studies (Çetinkaya 2006, İnnal & Erk'akan 2006, İnnal 2012, Tarkan et al. 2014, 2015). The range extensions of some exotic species have been continuing into other parts of Anatolia and have been becoming invasive in the freshwater biomes of Turkey. Some of the introduced species could not breed naturally (e.g. *Oncorhynchus mykiss*), however, this species continue to presence in freshwater habitats. They continued to escape from aquaculture unit. While some invasive species spread rapidly and colonized into aquatic habitats in Anatolia after introduction (e.g. *Carassius gibelio* and *Pseudorasbora parva*), some of them could not become widespread, and even some ones have failed to establish self-sustaining populations in the wild environment after introduction (e.g. *Salvelinus alpinus*, *Coregonus macrophthalmus* and *C. wartmanni*, *Hypophthalmichthys molitrix*). Additionally, some species had been imported into Turkey by aquaculture research stations at universities and/or governmental research hatcheries, but never released into the natural environment (e.g. *Acipenser baeri*, *Ictalurus punctatus* and *Hypophthalmichthys nobilis*) (İnnal 2012, Tarkan et al. 2015). Up to now, nearly 24 exotic species (except *Salmo salar*) have re-

ported from inland waters of Turkey in wild (Çetinkaya 2006, İnnal & Erk'akan 2006, İnnal 2012, Tarkan et al. 2014, 2015). The checklist only includes introduced species reported from the natural environment in Turkey. The exotic species have been cultured in closed systems are not listed in this checklist.

Turkey and neighboring countries were compared in terms of the number of species of freshwater ichthyofauna (Table 2). Nonetheless, this comparison highlights the species richness of Turkey is the richest one of any other country. Owing to the increased efforts paid to taxonomic studies carried out in poorly known region of Turkey, it will be probable that many new fish species will be recorded from Turkey. Additionally, number of the fish species will be increase with the influx of exotic fish species into Turkey should also not be ignored.

An obvious candidate for this comparison is Iran a neighboring country which had its freshwater fish fauna recently summarized (Esmaili et al. 2010) and has been updated regularly a website contains valuable commentary on individual taxa namely Freshwater Fishes of Iran prepared by Brain W. Coad (Coad 2015). According to studies given above freshwater fish fauna of Iran recognized 206 species. Although the land expanse of Iran is two times larger than that of Turkey, the number of freshwater fish species reported from Iran (206 species) is circa over 55% of the Turkey (368 species). In addition, beyond the sheer number of species of Turkey relative to its size, the diversity and endemism of fishes that contribute to that fauna is impressive. The endemic fish species consist of 41.58% of the total freshwater fish fauna.

Therefore, both total numbers of fish species and endemic species over the reported numbers by the author.)

Although many new species described from Turkey in just recent years, there have still been not an applicable identification keys and many lack of zoogeography of freshwater fishes of Turkey. Therefore, further research and taxonomic revisions are urgently needed on the freshwater fish fauna of Turkey. In this context, we believe that some of newly reported species are ambiguous and need additional discussion and deliberation by the ichthyological authorities. Not only new records but also old records being revised as new information are received with the point of view historical data. A very serious problem with ichthyological literature (especially papers in the recent past) is that authors uncriti-

Table 2. Diversity of fishes of neighboring countries.

| Country | # Total Species | # Endemic (Rate) | # Introduced (Rate) | Source |
|--------------------|-----------------|------------------|---------------------|------------------------------|
| Iran | 202 | 39 (19.30%) | 25 (11.5%) | Esmaili et al. (2010, 2014b) |
| Iran* | 206 | 43 (20.87%) | 23 (11.17%) | Coad, 2015 |
| Iraq | 62 | | 9 (14.52%) | Coad, 2010 |
| Syria | 73 | | 8 (10.96%) | Froese and Pauly, 2015 |
| Armenia | 39 | 3 (7.69%) | 11 (28.21%) | Gabrielyan, 2001 |
| Georgia | 61 | | 10 (16.39%) | Ninua and Japoshvili, 2008 |
| Bulgaria | | | 26 (24.53%) | Uzunova and Zlatanova, 2007 |
| Bulgaria | 106 | | | Carpio et al. 2013 |
| Greece | 162 | | 25 (15.43%) | Economou et al. 2007 |
| European Continent | 522 | | | Carpio et al. 2013 |
| | | | 33 (6.32%) | Kottelat & Freyhof 2007 |
| Turkey | 368 | 153 (41.58%) | 28 (7.61%) | This study |

(* Some new species reported from Iran in recent years (e.g. Mousavi-Sabet et al. 2015a,b; Vatandoust & Eagderi 2015).

cally rely on earlier data, the result that many reviews are merely compilations of old and often incompatible information. Errors are thus propagated over long periods of time (Kottelat & Freyhof 2007). Actually the same case applies for the freshwater ichthyofauna of Turkey.

However, some new species were reported from in a single basin or eco-region with in very narrow range geographically to each other. It is probably that there are members of same species distributed with in a small range of subpopulations of the species. For example, both *C. turani* and *C. erhani* are valid species newly described from Seyhan and Ceyhan River, respectively (Ozuluğ & Freyhof 2008a, Turan et al. 2008a). However Erk'akan & Özdemir (2011) imply that both of them are synonymous with *C. barroisi* and there are only minor morphologic distinctions among them. Precisely for this reason, recent new fish records from Turkey should be carefully evaluated, argued and revised with a deep knowledge and with a wide perspective. As a result of the emergence of some fish species that are probable that to be synonymous each other with a reduction in the total number of species.

Most of the newly described species originated from central and western Anatolia where ichthyologically relatively good sampled regions of Turkey in recent. There are few faunistic studies conducted on eastern parts of Turkey. The ichthyofauna of eastern parts of Anatolia has been still poorly known (Coad & Sarieyüpoğlu 1988). Besides distributions of occurrence of some fish species into Turkey's water basins are controversial. In this way there is no doubt that exploration of the Turkey's fish fauna is still far from complete. Notwithstanding had been conducted many research on the freshwater fishes of Turkey, numerous new records have to be expected, as well as a number of Anatolian endemic species.

An understanding of the diversity of the freshwater ichthyofauna of any country is crucial so that scientists, policy makers, resources managers, and members of the public can better evaluate the impact of human activities on the freshwater fishes within the country (Maldonado-Ocampo et al. 2008). The freshwater ichthyofauna of Turkey still incomplete. Therefore this checklist may provide guideline for continuing studies of the freshwater ichthyofauna of Turkey. Because of the checklist prepared mainly based on the earlier data provided by previous checklists, future research will result in additions to, and refinements of, our knowledge of that species-level diversity of that fauna, major components of which remain poorly understood or in many instances unknown. One must not read too much into this ratio in light of the numerous uncertainties involving the number of freshwater species resident in Turkey and the often-demonstrated major gaps in our knowledge of their actual geographic distributions.

Acknowledgments. We would like to express our profound gratitude and respect to Ord. Prof. Dr. Curt Kosswig, whose invaluable contributions to the field of hydrobiology in Turkey have been a great source of inspiration for us. We would also like to take the opportunity to express our deep appreciation and gratitude to all the scientists and to Dr. Mustafa Kuru in particular, for completing systematic and taxonomic studies of fish in Turkey and for making

important contributions to the field of ichthyology and to the inventory of fish species. Additionally, we would like to express our sincere thanks to M. Onur Özelsancak for taking time to proofread the English versions of our articles. Special thanks go to our families for their eternal love and unflinching support, without which we would have never achieved what we have achieved so far. Moreover, I, Erdoğan Çiçek, would like to express my heartfelt thanks to: Dr. Murat Bilecenoğlu for his invaluable guidance and companionship, which has had an important influence on my professional development. Furthermore, my sincere thanks go to Dr. Füsün Erkakan, Dr. Müfit Özuluğ, Dr. Ünal Erdem, Dr. Nuri Başusta and Dr. Mehmet Karataş who have provided me with their unflinching support and profound knowledge. Last but not least, I would like to express my deepest gratitude to Dr. Ali Demirsoy, who has made important contributions to the field of biology and who has like Ord. Prof. Dr. Curt Kosswig been a role model for me.

References

- Abbott, K.E. (1835): Letter accompanying a collection from Trebizond and Erzeroun. Proceedings of the Zoological Society of London 3: 89-92.
- Afraei Bandpei, M.A., El-Sayed, M.A-F., Pourgholam, R., Nasrolahzadeh, H., Valinassab, T. (2012): Food and feeding habits of the Caspian marine shad, *Alosa braschnikowi* (Clupeidae) in the southern Caspian Sea. CYBIUM: International Journal of Ichthyology 36: 411-416.
- Başusta, A., Başusta, N., Aydin, R., Ozer, E.L., Girgin, H. (2014): Age determination of Red-Spotted Trout (*Salmo macrostigma*) inhabiting Munzur Stream, Turkey. Pakistan Journal of Zoology 46: 1351-1356.
- Bat, L., Erdem, Y., Ustaoglu, S., Yardim, Ö., Satılmış, H.H. (2005): A study on the fishes of the central Black Sea coast of Turkey. Journal of the Black Sea/Mediterranean Environment 11: 281-296.
- Berg, L.S. (1911): Faune de la Russie et des pays limitrophes. Poissons (Marsipobranchii et Pisces). Vol. 1. Marsipobranchii, Selachii et Chondrostei. [In Russian.] St. Petersburg: 1-337, pls. 1-8.
- Berg, L.S. (1962): Fresh-water fishes of the U.S.S.R. and adjacent countries, Academy of the U.S.S.R. Zoological Institute Translated From Russian, Jerusalem.
- Bilecenoğlu, M., Kaya, M., Cihangir, B., Çiçek, E. (2014): An updated checklist of the marine fishes of Turkey. Turkish Journal of Zoology 38: 901-929.
- Bilecenoğlu, M., Taşkavak, E., Mater, S., Kaya, M. (2002a): Checklist of the marine fishes of Turkey. Zootaxa 113: 1-194.
- Birecikligil, S., Çiçek, E. (2011): Freshwater fish fauna of the rivers flow to Euphrates and Orontes rivers in Gaziantep. Journal of Biological Sciences 4: 29-31.
- Bogutskaya, N.G. (1996): Contribution to the knowledge of leuciscine fishes of Asia Minor. Part 1. Morphology and taxonomic relationships of *Leuciscus borysthemicus* (Kessler, 1859), *L. smyrnaeus* Boulenger, 1896 and *Ladigesocypris ghigii* (Gianferrari, 1927). Publicaciones especiales del Instituto Español de Oceanografía 21: 25-44.
- Bogutskaya, N.G., Küçük, F., Atalay, M.A. (2006): A description of three new species of the genus *Pseudophoxinus* from Turkey (Teleostei: Cyprinidae: Leuciscinae). Zoosystematica Rossica 15: 335-341.
- Borkenhagen, K., Krupp, F. (2013): Taxonomic revision of the genus *Carasobarbus* Karaman, 1971 (Actinopterygii, Cyprinidae). ZooKeys 339: 1-53.
- Carpio, A.P., Sánchez, S., Nieto, A., Bilz, M. (2013): Bulgaria's biodiversity at risk. IUCN, European Union Representative Office, Brussels, Belgium, 8p.
- Çetinkaya, O. (2006): Exotic and native fish species that introduced or stocked into Turkish waters, their impacts on aquaculture, fisheries, wild populations and aquatic ecosystems: a preliminary study on constructing a database. Symposium on the stocking reservoir management, 07-09 February 2006, Antalya, Turkey.
- Çevik, C., Ergüden, D., Tekelioğlu, N. (2010): Confirmation of the presence of the Sea Lamprey, *Petromyzon marinus* Linnaeus, 1758 in the Levantine Sea (Petromyzoniformes: Petromyzonidae). Zoology in the Middle East 49: 107-108.
- Coad, B.W. (2006): Endemism in the Freshwater Fishes of Iran. Iranian Journal of Animal Biosystematics 1: 1-13.
- Coad, B.W. (2010): Freshwater fishes of Iraq. Pensoft Publishers, Sofia, Bulgaria, 275 pp + 16 pls.
- Coad, B.W. (2015): Freshwater fishes of Iran. Revised: 05 January 2015, www.briancoad.com, (04.03.2015).
- Coad, B.W., Sarieyüpoğlu, S., (1988): *Cobitis elazigensis*, a new species of cobitid fish from Anatolia, Turkey. Japanese Journal of Ichthyology 34: 426-430.

- Delling, B., Doadrio, I. (2005): Systematics of the trouts endemic to Moroccan lakes, with description of a new species (Teleostei: Salmonidae). *Ichthyological Exploration of Freshwaters* 16: 49-64.
- Doadrio, I., Carmona, J.A. (2006): Phylogenetic overview of the genus *Squalius* (Actinopterygii, Cyprinidae) in the Iberian Peninsula, with description of two new species. *Cybius* 30: 199-214.
- Economou, A.N., Giakoumi, S., Vardakas, L., Barbieri, R., Stoumboudi, M., Zogaris, S. (2007): The freshwater ichthyofauna of Greece - an update based on a hydrographic basin survey. *Mediterranean Marine Science* 8: 91-166.
- Elp, M., Özüluğ, M., Şen, F., Freyhof, J. (2013): Validation of *Alburnus timarensis* from the Lake Van basin, eastern Anatolia (Teleostei: Cyprinidae). *Zoology in the Middle East* 59: 235-244.
- Elp, M., Şen, F., Özüluğ, M. (2015): *Alburnus selcuklui*, a new species of cyprinid fish from east Anatolia, Turkey (Teleostei: Cyprinidae). *Turkish Journal of Fisheries and Aquatic Sciences* 15: 181-186.
- Ergüven, H. (1989): Sapanca Gölüne dökülen derelerde yaşayan Petromyzonidae familyasının parazit türünün saptanması üzerinde bir araştırma. *İstanbul Üniversitesi Su Ürünleri Dergisi* 3: 29-36.
- Erk'akan, F. (2012): Two new *Oxyynoemacheilus* (Teleostei: Nemacheilidae) species from western Turkey. *Research Journal of Biological Sciences* 7: 97-101.
- Erk'akan, F., Atalay-Ekmekçi, F.G., Nalbant, T.T. (1998): Four new species and one new subspecies of the genus *Cobitis* (Pisces: Ostariophysi: Cobitidae) from Turkey. *Turkish Journal of Zoology* 22: 9-15.
- Erk'akan, F., Kuru, M. (1986): A new Noemacheilinae loach subspecies from the Lake Van Basin, Turkey (Osteichthyes, Cobitidae). *Doga Turk Biyoloji Dergisi* 10: 160-162.
- Erk'akan, F., Nalbant, T.T., Özeren, S.C. (2007a): Seven new species of *Barbatula*, three new species of *Schistura* and a new species of *Seminemacheilus* (Ostariophysi: Balitoridae: Nemacheilinae) from Turkey. *Journal of Fisheries International* 2: 69-85.
- Erk'akan, F., Özdemir, F. (2011): Revision of the fish fauna of the Seyhan and Ceyhan River Basins in Turkey. *Research Journal of Biological Science* 6: 1-8.
- Erk'akan, F., Özdemir, F. (2014): The first new cave fish species, *Cobitis damlae* (Teleostei: Cobitidae) from Turkey. *Hacettepe Journal of Biology and Chemistry* 42: 275-279.
- Erk'akan, F., Özeren, S.C., Nalbant, T.T. (2008a): *Cobitis evreni* sp. nova - a new spined loach species (Cobitidae) from the southern Turkey. *Journal of Fisheries International* 3: 112-114.
- Erk'akan, F., Özeren, S.C., Nalbant, T.T. (2008b): Two new species of stone loaches from Turkey (Teleostei: Nemacheilidae). *Journal of Fisheries International* 3: 115-119.
- Eschmeyer, W.N., Fricke, R. (eds) (2015): *Catalog of Fishes: Genera, Species, References*. <<http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>>. Electronic version accessed 13.07.2015.
- Esmaili, H.R., Coad, B.W., Gholamifard, A., Nazari, N., Teimory, A. (2010): Annotated checklist of the freshwater fishes of Iran. *Zoosystematica Rossica* 19: 361-386.
- Esmaili, H.R., Sayyadzadeh, G., Özüluğ, M., Geiger, M., Freyhof, J. (2014a): Three new species of *Turcinoemacheilus* from Iran and Turkey (Teleostei: Nemacheilidae). *Ichthyological Exploration of Freshwaters* 24: 257-273.
- Esmaili, H.R., Teimory, A., Owfi, F., Abbasi, K., Coad, B.W. (2014b): Alien and invasive freshwater fish species in Iran: Diversity, environmental impacts and management. *Iranian Journal of Ichthyology* 1: 61-72.
- Freyhof, J. (2013): *Sander volgensis*. The IUCN Red List of Threatened Species. Version 2015.1. <www.iucnredlist.org>. Downloaded on 09 June 2015.
- Freyhof, J. (2014): *Acanthobrama tricolor*. The IUCN Red List of Threatened Species. Version 2015.1. <www.iucnredlist.org>. Downloaded on 10 June 2015.
- Freyhof, J., Erk'akan, F., Özeren, S.C., Perdices, A. (2011): An overview of the western Palaearctic loach genus *Oxyynoemacheilus* (Teleostei: Nemacheilidae). *Ichthyological Exploration of Freshwaters* 22: 301-312.
- Freyhof, J., Kottelat, M. (2007): *Alburnus vistoncus*, a new species of shemaya from eastern Greece, with remarks on *Chalcalburnus chalcoides macedonicus* from Lake Volvi (Teleostei: Cyprinidae). *Ichthyological Exploration of Freshwaters* 18: 205-212.
- Freyhof, J., Kottelat, M. (2008): *Caspiomyzon wagneri*. The IUCN Red List of Threatened Species. Version 2014.3. <www.iucnredlist.org>. (14.02.2015).
- Freyhof, J., Özüluğ, M. (2006): *Pseudophoxinus ninae*, a new species from Central Anatolia, Turkey (Teleostei: Cyprinidae). *Ichthyological Exploration of Freshwaters* 17: 255-259.
- Freyhof, J., Özüluğ, M. (2010a): *Pseudophoxinus evliyaevi*, a new species of spring minnow from western Anatolia with remarks on the distribution of *P. ninae* and the systematic position of *P. fahirae* (Teleostei: Cyprinidae). *Ichthyological Exploration of Freshwaters* 20: 309-318.
- Freyhof, J., Özüluğ, M. (2010b): *Pseudophoxinus fahrettini*, a new species of spring minnow from Central Anatolia (Teleostei: Cyprinidae). *Ichthyological Exploration of Freshwaters* 20: 325-332.
- Freyhof, J., Özüluğ, M. (2010c): *Pseudophoxinus hittitorum*, a new species of spring minnow from Central Anatolia (Teleostei: Cyprinidae). *Ichthyological Exploration of Freshwaters* 21: 239-245.
- Freyhof, J., Özüluğ, M. (2014): *Acanthobrama thisbeae*, a new species of bream from southern Anatolia, Turkey (Teleostei: Cyprinidae). *Ichthyological Exploration of Freshwaters* 25: 1-10.
- Fricke, R., Bilecenoglu, M., Sarı, H.M. (2007): Annotated checklist of fish and lamprey species (Gnathostomata and Petromyzontomorpha) of Turkey, including a Red List of threatened and declining species. *Stuttgarter Beiträge zur Naturkunde* 706: 1-169.
- Froese, R., Pauly, D. (eds.) (2014): *FishBase*. World Wide Web electronic publication. www.fishbase.org, version 11/2014.
- Gabrielyan, B.K. (2001): An annotated checklist of freshwater fishes of Armenia. *Naga, The ICLARM Quarterly* 24: 23-29, 2001.
- Geldiay, R., Balık, S. (2007): *Freshwater Fishes of Turkey*. V. Edition, Ege University Press, Bornova, Izmir, 638p.
- Geldiay, R., Balık, S. (1988): *Freshwater Fishes of Turkey*. I. Edition, Ege University Press, Bornova, Izmir, 519p.
- Geldiay, R., Balık, S. (1996): *Freshwater Fishes of Turkey*. II. Edition, Ege University Press, Bornova, Izmir, 519p.
- Geldiay, R., Balık, S. (1999): *Freshwater Fishes of Turkey*. III. Edition, Ege University Press, Bornova, Izmir, 532p.
- Geldiay, R., Balık, S. (2002): *Freshwater Fishes of Turkey*. IV. Edition, Ege University Press, Bornova, Izmir, 532p.
- Hanko, B. (1924): *Fische aus Kleinasien*. *Ann. Hist. Nat. Mus. Nation. Hung.* 21: 137-158.
- Heckel, J.J. (1843): *Ichthyologie [von Syrien]*. In: *Russegger, J. von: Reisen in Europa, Asien und Africa, mit besonderer Rücksicht auf die naturwissenschaftlichen Verhältnisse der betreffenden Länder unternommen in den Jahren 1835 bis 1841, etc., vol. 1, part 2, pp. 990-1099, Stuttgart (Schweizerbart)*.
- Innal, D. (2012): Alien fish species in reservoir systems in Turkey: a review. *Management of Biological Invasions* 3: 115-119.
- Innal, D., Erk'akan, F. (2006): Effects of exotic and translocated fish species in the inland waters of Turkey. *Reviews in Fish Biology and Fisheries* 16: 39-50.
- Kottelat, M. (2012): *Conspectus Cobitidum: an inventory of the loaches of the world* (Teleostei: Cypriniformes: Cobitoidei). *The Raffles Bulletin of Zoology* 26: 1-199.
- Kottelat, M., Economidis, P.S. (2006): *Squalius orpheus*, a new species of cyprinid fish from Evros drainage, Greece (Teleostei: Cyprinidae). *Ichthyological Exploration of Freshwaters* 17: 181-186.
- Kottelat, M., Freyhof, J. (2007): *Handbook of European Freshwater Fishes*. Cornol, Switzerland: xiii + 646 pp.
- Kovačić, M., Engin, S. (2008): Two new species of *Neogobius* (Gobiidae) from northeastern Turkey. *Cybius* 32: 73-80.
- Küçük, F., Güçlü, S.S. (2014): A new *Pseudophoxinus* (Teleostei, Cyprinidae) species from Asi River Drainage (Turkey). *ZooKeys* 411: 57-66.
- Küçük, F. (2007): *Pseudophoxinus alii* (Teleostei: Cyprinidae), a new fish species from the Antalya Region, Turkey. *Turkish Journal of Zoology* 31: 1-8.
- Küçük, F. (2012): Extinct endemic fishes of Turkey: *Alburnus akili* (Gövcü) and *Pseudophoxinus handlirschi* (Kavinne) (Pisces: Cyprinidae). *Turkish Journal of Fisheries and Aquatic Sciences* 12: 345-347.
- Küçük, F., Bektaş, Y., Güçlü, S.S., Kaya, C. (2014): The systematic position of *Acanthalburnus microlepis* (De Filippi, 1863) and contributions to the genus *Acanthobrama* (Cyprinidae: Leuciscinae) in Turkey. *Iranian Journal of Ichthyology* 1: 96-105.
- Küçük, F., Güllü, I., Güçlü, S.S., Çiftçi, Y., Erdoğan, Ö. (2013): A new *Pseudophoxinus* (Teleostei, Cyprinidae) species from southwestern Anatolia, with remarks on the distribution of the genus in western Anatolia. *ZooKeys* 320: 29-41.
- Küçük, F., Turan, D., Şahin, C., Güllü, İ. (2009): *Capoeta mauricii* n. sp., a new species of cyprinid fish from Lake Beyşehir, Turkey (Osteichthyes: Cyprinidae). *Zoology in the Middle East* 47: 71-82.
- Kuru, M. (2004): Recent Systematic Status of Inland Water Fishes of Turkey. *GÜ Gazi Eğitim Fakültesi Dergisi* 24: 1-21.
- Ladiges, W. (1960): *Süßwasserfische der Türkei, 1. Teil: Cyprinidae*. *Mitteilungen aus dem hamburgischen Zoologischen Museum und Institut* 58: 105-150.
- Ladiges, W. (1964): *Süßwasserfische der Türkei, 3. Teil: Restliche Gruppen*. *Mitteilungen aus dem hamburgischen Zoologischen Museum und Institut* 61: 203-220.
- Ladiges, W. (1966): *Süßwasserfische der Türkei, 4. Teil: Die Gattung Chondrostoma (Cyprinidae) in der Türkei*. *Mitteilungen aus dem hamburgischen Zoologischen Museum und Institut* 63: 101-109.
- Lazara, K.J. (2001): The killifishes, an annotated checklist, synonymy, and bibliography of recent oviparous Cyprinodontiform fishes. *The killifish master index* 4. i-xviii + 1-624, appendices A-C.
- Levin, B.A., Freyhof, J., Lajbner, Z., Perea, S., Abdoli, A., Gaffaroglu, M., Özüluğ, M., Rubenyan, H.R., Salnikov, V. B. Doadrio, I. (2012): Phylogenetic

- relationships of the algae scraping cyprinid genus *Capoeta* (Teleostei: Cyprinidae). *Molecular Phylogenetics and Evolution* 62: 542-549.
- Maldonado-Ocampo, J.A., Vari, R.P., Usma, J.S. (2008): Checklist of the freshwater fishes of Colombia. *Biota Colombiana* 9: 143-237.
- Miller, P.J. (1986): *Gobiidae*. pp. 1019-1085. In: Whitehead, P.J.P., Bauchot, M.L., Hureau, J.C., Nielsen, J., Tortonese, E. (eds.) *Fishes of the North-eastern Atlantic and the Mediterranean*. Volume 3. UNESCO, Paris.
- Mousavi-Sabet, H., Vatandoust, S., Esmaili, H.R., Geiger, M.F., Freyhof, J. (2015a): *Cobitis avicennae*, a new species of spined loach from the Tigris River drainage (Teleostei: Cobitidae). *Zootaxa* 3914: 558-568.
- Mousavi-Sabet, H., Vatandoust, S., Khataminejad, S., Eagderi, S., Abbasi, K., Nasri, M., Jouladeh, A., Vasil'eva, E.D. (2015b): *Alburnus amirkabiri* (Teleostei), a new species of Shemaya from the Namak Lake Basin, Iran. *Journal of Ichthyology* 55: 40-52.
- Nalbant, T.T., Bianco, P.G. (1998): The loaches of Iran and adjacent regions with description of six new species (Cobitoidea). *Italian Journal of Zoology* 65: 109-125.
- Naseka, A.M. (2010): Zoogeographical freshwater divisions of the Caucasus as a part of the West Asian transitional region. *Proceedings of the Zoological Institute RAS* 314: 469-492.
- Naseka, A.M., Erk'akan, F., Küçük, F. (2006): A description of two new species of the genus *Gobio* from Central Anatolia (Turkey) (Teleostei: Cyprinidae). *Zoosystematica Rossica* 15: 185-194.
- Naseka, A.M., Freyhof, J. (2004): *Romanogobio parvus*, a new gudgeon from River Kuban, southern Russia (Cyprinidae, Gobioninae). *Ichthyological Exploration of Freshwaters* 15: 17-23.
- Ninua, N.Sh., Japoshvili, B.O. (2008): Check list of fishes of Georgia. *Proceedings of the Institute of Zoology* 23: 163-176.
- Özuluğ, M., Freyhof, J. (2008a): *Capoeta turani*, a new species of barbel from River Seyhan, Turkey (Teleostei: Cyprinidae). *Ichthyological Exploration of Freshwaters* 19: 289-296.
- Özuluğ, M., Freyhof, J. (2008b): *Alburnus demiri*, a new species of bleak from Western Anatolia, Turkey (Teleostei: Cyprinidae). *Ichthyological Exploration of Freshwaters* 18: 307-312.
- Özuluğ, M., Freyhof, J. (2011a): Revision of the genus *Squalius* in Western and Central Anatolia, with description of four new species (Teleostei: Cyprinidae). *Ichthyological Exploration of Freshwaters* 22: 107-148.
- Özuluğ, M., Freyhof, J. (2007): Rediagnosis of four species of *Alburnus* from Turkey and description of two new species (Teleostei: Cyprinidae). *Ichthyological Exploration of Freshwaters* 18: 233-246.
- Özuluğ, M., Tarkan, A.S., Gaygusuz, Ö., Gürsoy, Ç. (2007): Two new records for the fish fauna of Lake Sapanca Basin (Sakarya, Turkey). *Journal of Fisheries Sciences.com*. 1: 152-159.
- Parenti, L.R. (2002): The Killifishes: An Annotated Checklist, Synonymy And Bibliography Of Recent Oviparous Cyprinodontiform Fishes: The Killifish Master Index. *Copeia* 2002: 881-883.
- Parin, N.P., Evseenko, S.A., Vasil'eva, E.D. (2014): *Fishes of Russian Seas, Annotated Catalogue*. Proceedings of the Zoological Museum of the Moscow State University, KMK Sci Press, Moscow, 733 pp.
- Pellegrin, J. (1927): Description d'un cyprinidé nouveau d'Asie Mineure. *Bulletin de la Société Zoologique de France* 52: 34-35.
- Pfleiderer, S.J., Geiger, M.F., Herder, F. (2014): *Aphanius marassantensis*, a new toothcarp from the Kızılırmak drainage in northern Anatolia (Cyprinodontiformes: Cyprinodontidae). *Zootaxa* 3887: 569-582.
- Reshetnikov, Y.S., Bogutskaya, N.G., Vasil'eva, E.D., Dorofeeva, E.A., Naseka, A.M., Popova, O.A., Savvaitova, K.A., Sideleva V.G., Sokolov, L.I. (1997): An annotated check-list of the freshwater fishes of Russia. *Journal of Ichthyology* 37: 687-736.
- Saç, G., Özuluğ, M. (2013): Distribution and conservation status of endangered *Phoxinus phoxinus* (Teleostei: Cyprinidae). *Symposium for European Freshwater Sciences, Germany*, 1-5 July, 2013.
- Saç, G., Özuluğ, M. (2015): New data on the distribution and conservation status of *Phoxinus phoxinus* (Teleostei: Cyprinidae). *Ichthyological Exploration of Freshwaters* 25: 381-383.
- Schöter, C., Özuluğ, M., Freyhof, J. (2009): *Capoeta caelestis*, a new species from Göksu River, Turkey (Teleostei: Cyprinidae). *Ichthyological Exploration of Freshwaters* 20: 229-236.
- Stoumboudi, M.Th., Kottelat, M., Barbieri, R. (2006): The fishes of the inland waters of Lesbos Island, Greece. *Ichthyological Exploration of Freshwaters* 17: 129-146.
- Tarkan, A.S. (2006): A story of Pirana in Sapanca Lake. *Av Doğa* 41: 75-77.
- Tarkan, A.S., Ekmekçi, F.G., Vilizzi, L., Copp, G.H. (2014): Risk screening of nonnative freshwater fishes at the frontier between Asia and Europe: first application in Turkey of the fish invasiveness screening kit. *Journal of Applied Ichthyology* 30: 392-398.
- Tarkan, A.S., Marr, S.M., Ekmekçi, F.G. (2015): Non-native and translocated freshwater fish species in Turkey. *FISHMED Fishes in Mediterranean Environments* 2015.003: 28p.
- Turan D., Ekmekçi F.G., Luskova V., Mendel, J. (2012a): Description of a new species of genus *Gobio* from Turkey (Teleostei: Cyprinidae). *Zootaxa* 3257: 56-65.
- Turan, D., Doğan, E., Kaya, C., Kanyılmaz, M. (2014c): *Salmo kottelati*, a new species of trout from Alakır Stream, draining to the Mediterranean in southern Anatolia, Turkey (Teleostei, Salmonidae). *ZooKeys* 462: 135-151.
- Turan, D., Ekmekçi, F.G., İlhan, A., Engin, S. (2008b): *Luciobarbus kottelati*, a new species of barbel (Teleostei: Cyprinidae) from the Büyük Menderes River, Turkey, with rediagnosis of *L. lydius*. *Zootaxa* 1824: 35-44.
- Turan, D., Ekmekçi, F.G., Kaya, C., Güçlü, S.S. (2013b): *Alburnoides manyasensis* (Actinopterygii, Cyprinidae), a new species of cyprinid fish from Manyas Lake basin, Turkey. *ZooKeys* 276: 85-102.
- Turan, D., Kaya, C., Ekmekçi, F.G., Doğan, E. (2014a): Three new species of *Alburnoides* (Teleostei: Cyprinidae) from Euphrates River, Eastern Anatolia, Turkey. *Zootaxa* 3754: 101-116.
- Turan, D., Kottelat, M., Bektaş, Y. (2011): *Salmo tigridis*, a new species of trout from Tigris River, Turkey (Teleostei: Salmonidae). *Zootaxa* 2993: 23-33.
- Turan, D., Kottelat, M., Doğan, E. (2013a): Two new species of *Squalius*, *S. adanaensis* and *S. seyhanensis* (Teleostei: Cyprinidae), from the Seyhan River in Turkey. *Zootaxa* 3637: 308-324.
- Turan, D., Kottelat, M., Ekmekçi, F.G. (2008a): *Capoeta erhani*, a new species of cyprinid fish from Ceyhan River, Turkey (Teleostei: Cyprinidae). *Ichthyological Exploration of Freshwaters* 19: 263-270.
- Turan, D., Kottelat, M., Ekmekçi, F.G. (2009a): *Barbus niluferensis*, a new species of barbel (Teleostei: Cyprinidae) from Nilüfer River, Turkey, with redescription of *B. oligolepis*. *Zootaxa* 1981: 15-28.
- Turan, D., Kottelat, M., Engin, S. (2010): Two new species of trouts, resident and migratory, sympatric in streams of northern Anatolia (Salmoniformes: Salmonidae). *Ichthyological Exploration of Freshwaters* 20: 333-364.
- Turan, D., Kottelat, M., Engin, S. (2012b): The trouts of the Mediterranean drainages of southern Anatolia, Turkey, with description of three new species (Teleostei: Salmonidae). *Ichthyological Exploration of Freshwaters* 23: 219-236.
- Turan, D., Kottelat, M., Engin, S. (2014b): Two new species of trouts from the Euphrates drainage, Turkey (Teleostei: Salmonidae). *Ichthyological Exploration of Freshwaters* 24: 275-287.
- Turan, D., Yılmaz, B. T., Kaya, C. (2009b): *Squalius kottelati*, a new cyprinid species (Teleostei: Cyprinidae) from Orontes River Turkey. *Zootaxa* 2270: 53-62.
- Ünlü, E., Çiçek, T., Değer, D., Coad, B.W. (2011): Range extension of the exotic Indian stinging catfish, *Heteropneustes fossilis* (Bloch, 1794): (Heteropneustidae) into the Turkish part of the Tigris River watershed. *Journal of Applied Ichthyology* 27: 141-143.
- Uzunova, E., Zlatanova, S. (2007): A review of the fish introductions in Bulgarian freshwaters. *Acta Ichthyologica et Piscatoria* 37: 55-61.
- Van der Laan, R., Eschmeyer, W.N., Fricke, R. (2014): Family-group names of recent fishes. *Zootaxa Monograph* 3882: 1-230.
- Vasil'eva, E.D., Vasil'ev, V.P. (2006): *Cobitis pontica* sp. nova - a new spined loach species (Cobitidae) from Bulgarian waters. *Journal of Ichthyology* 46: 15-20.
- Vatandoust, S., Eagderi, S. (2015): *Paraschistura ilamensis*, a new species of loach from the Tigris River drainage (Teleostei: Nemacheilidae). *International Journal of Aquatic Biology* 3: 177-182.
- Vidal, O., García-Berthou, E., Tedesco, P.A., García-Marin, J.-L. (2010): Origin and genetic diversity of mosquitofish (*Gambusia holbrooki*) introduced to Europe. *Biological Invasions* 12: 841-851.
- Yalçın Özdilek, Ş. (2007): Possible threat for Middle East inland water: an exotic and invasive species, *Pterygoplichthys disjunctivus* (Weber, 1991) in Asi River, Turkey (Pisces: Loricariidae). *Journal of Fisheries and Aquatic Sciences* 24: 303-306.