Distribution and diversity of fish from Seyhan, Ceyhan and Orontes river systems

Esra Bayçelebi

1 Recep Tayyip Erdogan University, Faculty of Fisheries and Aquatic Sciences, 53100 Rize, Turkey

Abstract

In this study, the current ichthyofauna of the Seyhan, Ceyhan and Orontes River drainages were presented and actual taxonomic positions of the species were assessed. Sixty-seven species belonging to 32 genera and 17 families of fishes were reported from these river drainages in Turkey and Syria. Acanthobrama centisquama and Tinca tinca could not be observed in the study area and Alburnus sellal and Esox lucius are recorded for the first time respectively in the Lake Gölbaşı (connected to the Ceyhan River) and Seyhan River.

Key Words

Freshwater fish, ichthyology, Syria, taxonomy, Turkey

Introduction

The Orontes, Seyhan and Ceyhan rivers are some of the largest rivers in the northern Mediterranean Sea. The Seyhan and Ceyhan rivers form Turkey’s largest delta plain, the Çukurova. These three river basins are host to many endemic species. Three of them can only be found in the Seyhan, seven of them only in the Ceyhan, and ten of them only in the Orontes. Their contribution to biodiversity is, without doubt, considerable. Several studies have been conducted on the distribution of fish species inhabited in the Seyhan, Ceyhan and Orontes rivers. Bostancı (2006) conducted the first ichthyofaunistic study in the area and revised the fish of these three rivers, after which Dağlı (2008) investigated only two northeastern tributaries of the Orontes River (streams Kinacik and Afrin). Kara et al. (2010) examined the fish of the upper and middle parts of the Ceyhan River. Erk’akan and Özdemir (2011) studied the fish of the Seyhan and Ceyhan rivers. Alagöz Ergüden and Gökşu (2012) studied the fish in the Seyhan Dam Lake and Özcan (2013) researched a study on the ichthyofauna of the Orontes River. A recent study by İnal (2020) reported on the fish diversity and abundance in the Seyhan River estuary (Table 2). A comprehensive study has not yet reached the Orontes River in Syria. Unlike the research above, Geiger et al. (2014) conducted a comprehensive genetic study of the freshwater fish of the Mediterranean basin. Consequently showing different data.

Taxonomic problems have continued to increase while different researchers have conducted faunistic studies related to these rivers (e.g. identifies incorrectly or misrecords the species, see Table 2). This study aims to eliminate these ambiguities and reveal the actual taxonomic status of the species in the area; in addition, the rate of endemism in the region is determined.

Materials and methods

Study area

The Ceyhan River originates from Pınarbaşı Village (Kahramanmaraş prov.). It forms a wide delta in Çukurova and pours into the Gulf of İskenderun in the Mediterranean Sea. Its main tributaries are the Söğütlü, Harman, Gökşu, Mağra Gözü, Firınç, Tekir, Körşulu and Aksu streams. The Seyhan River has two important
tributaries: the long one is the stream Zamantı, which originates from Uzun plateau (Kayseri prov.). This water flows in the direction of the stretch of the Middle Taurus Mountains (Tahtalı Mountains), merges with the Göksu that is the second tributary of the Seyhan, and pours from Adana into the Mediterranean Sea. The Orontes is a transboundary river, which originates from the eastern part of the Bekaa Valley in Lebanon, then through into Syria and flows into the Mediterranean Sea near Samandağ, Turkey.

Data collection and analyses

All the materials collected from the Seyhan and Ceyhan were gathered in Turkey, while the Orontes materials were collected from Syria and Turkey. The fish were caught from 82 sampling sites by using Samus 1000 pulsed DC electro-fishing equipment, cast net and gill net (Figs 1, 10, Table 1). After anaesthesia, fish samples were fixed in 4% formaldehyde and transferred to the laboratory for classifying the species level. Nomenclature and taxonomy almost all followed Eschmeyer’s Catalog of Fishes (Fricke et al. 2020) except for Capoeta turani (Kaya 2019). Common and Turkish names of the species were provided by FishBase (Froese and Pauly 2020). The names recommended in this study were denoted by an asterisk (*) at the end of the name. The global conservation status of the species was provided by the International Union for Conservation of Nature (IUCN 2020). The species photos were shown in Figs 2–9. The dataset was visualised using the open-source Geographic Information System QGIS version 3.8 (Zanzibar, 2019).

Abbreviations:

| Abbreviation | Description |
|--------------|-------------|
| FFR          | Recep Tayyip Erdogan University Zoology Museum of the Faculty of Fisheries, Rize. |
| FSJF         | Fischsammlung J. Freyhof, Berlin. |

Results

With this study, 18 species belonging to the family Leuciscidae were listed, followed by Cyprinidae with 12 species, Salmonidae with 5 species, Cobitidae and Aphanidae with 5 species, Cichlidae with 2 species, Mugilidae with 2 and Anguillidae, Blenniidae, Poeciliidae, Atherinidae, Esocidae, Clariidae, Bagridae and Siluridae with 1 species. The highest species diversity among these three river systems was observed in the Orontes (32 species), followed by Seyhan (29 species) and Ceyhan (27 species). According to data presented in this study, Capoeta damascina, Luciobarbus pectoralis, Squalius kottelati and Atherina boyeri are the species that are present in all three rivers.
Table 1. List of sampling locations, coordinates and the fish species recorded.

| No | Sampling Site | Coordinates | Geographic information | Observed Species |
|----|---------------|-------------|------------------------|------------------|
| 1  | Lake Balik    | 36.5081, 36.4948 | Turkey, Hatay prov.: Lake Balik al Kirikhan | Anguilla anguilla, Capoeta barrosi, Carasobarbus chantrei, Luciobarbus pectoralis, Chondrostoma kizilbechi, Pseudophoxinus libani, Mystus pelius, Planiliza abu, Coptodon zillii |
| 2  | Stream Söğütluöz | 36.6177, 36.4404 | Turkey, Hatay prov.: stream Söğütluöz at Kirikhan | Anguilla anguilla, Carasobarbus chantrei, Luciobarbus pectoralis, Alburnus onrtis, Squalius kottelati, Oxynoemacheilus hamwii, Oxynoemacheilus namiri |
| 3  | Orontes River-I | 36.0974, 36.0785 | Turkey, Hatay prov.: Orontes River-I at Sinanli | Anguilla anguilla, Capoeta damascina, Carasobarbus chantrei, Carassius gibelio, Garra caudomaculata, Garra sp., Luciobarbus pectoralis, Alburnus onrtis, Chondrostoma kizilbechi, Pseudophoxinus zeregi, Pseudophoxinus libani, Squalius kottelati, Cobitis anabelae, Gambusia holbrooki, Paraphanis ornontis |
| 4  | Stream Afrin-I | 36.8061, 36.9821 | Turkey, Kilis prov.: stream Afrin-I 15 km northwest of Kilis 36.8061 36.9821. | Capoeta barrosi, Luciobarbus pectoralis, Alburnus magnificus, Oxynoemacheilus hamwii, Planiliza abu |
| 5  | Stream Afrin-II | 36.8133, 36.9837 | Turkey, Kilis prov.: stream Afrin-II about 16 km west of Kilis | Capoeta damascina, Acanthobrama thsibae, Alburnus magnificus, Oxynoemacheilus hamwii, Oxynoemacheilus namiri |
| 6  | Stream Afrin-III | 36.5350 | Turkey, Kilis prov.: stream Afrin-III at northeastern Reyhanli | Alburnus onrtis, Cobitis anabelae, Clarias gariepinus, Oxynoemacheilus namiri, Gambusia holbrooki, Planiliza abu |
| 7  | Stream Bedrice | 36.3710, 36.9837 | Havy prov.: stream Afrin-III at northeastern Reyhanli | Alburnus magnificus, Oxynoemacheilus hamwii, Oxynoemacheilus namiri |
| 8  | Stream Karasu-I | 37.0306, 36.7064 | Turkey, Gaziantep prov.: stream Karasu-I at Isilahiye (upper Tahtakopru Dam) | Anguilla anguilla, Carasobarbus chantrei, Claybarus gibelio, Garra caudomaculata, Garra sp., Alburnus onrtis, Chondrostoma kizilbechi, Cobitis anabelae, Clarias gariepinus, Athrina boyeri |
| 9  | Stream Karasu-II | 36.8320, 36.6861 | Turkey, Gaziantep prov.: stream Karasu-II at Isilahiye (below Tahtakopru Dam) | Capoeta barrosi, Capoeta damascina, Carasobarbus chantrei, Carassius gibelio, Cyprinus carpio, Garra caudomaculata, Garra sp., Luciobarbus pectoralis, Pseudophoxinus turani, Squalius kottelati, Oxynoemacheilus hamwii, Athrina boyeri, Gambusia holbrooki |
| 10 | Stream Karasu-III | 36.9846, 36.7046 | Turkey, Gaziantep prov.: stream Karasu-III at Isilahiye | Alburnus onrtis, Pseudophoxinus turani, Squalius kottelati |
| 11 | Stream Karasu-IV | 36.4653, 36.3803 | Turkey, Hatay prov.: stream Karasu-IV about 4 km south of Kirikhan | Garra sp., Alburnus onrtis, Cobitis anabelae, Oxynoemacheilus namiri, Planiliza abu |
| 12 | Tahtakopru Dam | 36.8743, 36.6923 | Turkey, Gaziantep prov.: the lower part of Tahtakopru Dam Lake at Isilahiye | Chondrostoma kizilbechi, Squalius kottelati |
| 13 | Stream Buyukkara | 36.1355, 36.0422 | Turkey, Hatay prov.: stream Buyukkara at Karaçay | Capoeta damascina, Garra sp., Alburnus magnificus, Pseudophoxinus zeregi, Oxynoemacheilus namiri, Gambusia holbrooki |
| 14 | Stream Incesu | 36.7932, 36.5137 | Turkey, Hatay prov.: stream Incesu at Hissa | Capoeta damascina, Pseudophoxinus turani |
| 15 | Stream Hanne | 36.2072, 36.1236 | Turkey, Hatay prov.: stream Hanne 3 km west of Antakya | Anguilla anguilla, Pseudophoxinus zeregi, Oxynoemacheilus namiri, Clarias gariepinus |
| 16 | Stream Serinyol | 36.3655, 36.2138 | Turkey, Hatay prov.: stream Serinyol at Serinyol | Capoeta damascina, Garra sp., Gambusia holbrooki |
| 17 | Stream Yildirim | 36.3662, 36.1811 | Turkey, Hatay prov.: stream Yildirim at Serinyol | Capoeta damascina, Alburnus magnificus, Garra sp., Oxynoemacheilus hamwii, Clarias gariepinus, Pseudophoxinus zeregi, Athrina boyeri, Gambusia holbrooki |
| 18 | Lake Qattinah-I | 36.6619, 36.6183 | Syria, Lake Qattinah-I southeast of Homs | Carassius barbatus, Capoeta damascina, Carasobarbus chantrei, Garra sp., Luciobarbus pectoralis, Oxynoemacheilus namiri |
| 19 | Lake Qattinah-II | 36.5393, 36.5336 | Syria, Lake Qattinah-II at Al Gassaneyah | Pseudophoxinus libani, Paraphanis mento |
| 20 | Orontes River-II | 36.2717, 36.5628 | Syria, Orontes River-II at Shayzar | Garra caudomaculata, Garra variabilis, Pseudophoxinus libani, Oxynoemacheilus namiri, Paraphanis mento |
| 21 | Orontes River-III | 36.9444, 36.4025 | Syria, Orontes River-III at north of Ain al Zarqa | Carasobarbus chantrei, Garra caudomaculata, Garra sp., Alburnus onrtis, Oxynoemacheilus libani, Oxynoemacheilus namiri, Paraphanis mento |
| 22 | Orontes River-IV | 36.9508, 36.3998 | Syria, River Orontes-IV at MSahr al Bouz | Garra caudomaculata, Garra sp., Alburnus onrtis, Pseudophoxinus libani, Oxynoemacheilus namiri, Paraphanis mento |
| 23 | Orontes River-V | 36.0376, 36.8431 | Syria, Orontes River-V at Jinan | Garra sp. |
| 24 | Orontes River-VI | 36.5866, 36.5389 | Syria, Orontes River-VI at Jinan | Alburnus onrtis, Pseudophoxinus libani, Oxynoemacheilus namiri |
| 25 | Orontes River-VII | 36.5353, 36.7333 | Syria, Orontes River-VII at roadside north of Homs (fish market) | Leuciscus vorax |
| 26 | Stream Al Dawwar | 36.4697, 36.2531 | Syria, stream Al Dawwar South of Haydaryeh | Oxynoemacheilus namiri |
| 27 | Nahr Itrin River | 36.6172, 36.8608 | Syria, Nahr Itrin River below reservoir north of Afrin | Pseudophoxinus zeregi, Oxynoemacheilus namiri |
| 28 | Spring Al Fawwar | 36.5328, 36.2526 | Syria, spring Al Fawwar north of Masita Baythi Darwish | Garra caudomaculata, Pseudophoxinus libani |
| 29 | Lake Shadda | 35.5253, 36.2536 | Syria, Lake Shadda | Garra caudomaculata, Garra sp., Oxynoemacheilus namiri, Planiliza abu |
| 30 | Stream Nahr al Barid | 35.3022, 36.3453 | Syria, stream Nahr al Barid at Nahr al Barid | Garra caudomaculata, Garra variabilis, Alburnus onrtis, Pseudophoxinus libani, Oxynoemacheilus namiri, Paraphanis mento |
| No. | Sampling Site | Coordinates | Geographic information | Observed Species |
|-----|---------------|-------------|------------------------|------------------|
| 31  | Spring south of Qal’a at Jarras | 35.3305, 36.3106 | Syria, spring south of Qal’a at Jarras | Garra caudomaculata, Carassius gibelio, Salmo salar, Pseudophoxinus irati, Paraphanius similis, Larimichthys polyactis, Tristramella simonis |
| 32  | Stream Ecmiş | 37.8767, 34.9254 | Turkey, Niğde prov.: stream Ecmiş | Lospa lispilus |
| 33  | Stream Uçurgesiyyi-I | 37.2611, 35.0671 | Turkey, Adana prov.: stream Uçurgesiyyi-I at Karasali | Capoeta damascina, Capoeta erhanii, Garra lucioperca, Garra turcica, Luciobarbus pectoralis, Chondrostoma ceyhanensis, Squalius adanaensis, Cobitis aliyae, Oxynoemacheilus cilicicus, Salaria fluviatilis |
| 34  | Stream Uçurgesiyyi-II | 37.1485, 35.1422 | Turkey, Adana prov.: stream Uçurgesiyyi-II at Karasali | Lospa lispilus, Squalius adanaensis |
| 35  | Stream Uçurgesiyyi-III | 37.2750, 35.0610 | Turkey, Adana prov.: stream Uçurgesiyyi-III at western Çakalli | Alburnus kotschyi, Squalius adanaensis |
| 36  | Stream Uçurgesiyyi-IV | 37.1390, 35.1423 | Turkey, Adana prov.: stream Uçurgesiyyi-IV the lower part of Ecmiş stream east of Salbaş | Squalius adanaensis, Oxynoemacheilus cilicicus |
| 37  | Stream Uçurgesiyyi-V | 37.1890, 35.1010 | Turkey, Adana prov.: stream Uçurgesiyyi-V at Çakalli | Oxynoemacheilus seyhanicola |
| 38  | Stream Eglence | 37.3050, 35.2201 | Turkey, Adana prov.: stream Eglence 1 km northeast of Eglence | Oxynoemacheilus seyhanicola, Garra lucioperca, Oxynoemacheilus seyhanicola, Salaria fluviatilis, Luciobarbus pectoralis |
| 39  | Stream Çakıtsuyu-I | 37.1032, 35.1094 | Turkey, Adana prov.: stream Çakıtsuyu-I at Salbaş | Capoeta damascina, Capoeta erhanii, Chondrostoma ceyhanensis, Oxynoemacheilus seyhanicola, Salaria fluviatilis |
| 40  | Stream Çakıtsuyu-II | 37.0961, 35.1170 | Turkey, Adana prov.: stream Çakıtsuyu-II, south of Salbaş, the lower part of Pozanti Stream | Capoeta damascina, Garra turcica, Luciobarbus pectoralis, Oxynoemacheilus seyhanicola, Squalius adanaensis, Oxynoemacheilus cilicicus, Salaria fluviatilis |
| 41  | Stream Çakıtsuyu-III | 37.5072, 34.7904 | Turkey, Niğde prov.: stream Çakıtsuyu-III between Ulukışla and Pozanti, about 1 km east of Çiftehan | Capoeta damascina |
| 42  | Spring Karahalıka | 38.8857, 36.8194 | Turkey, Kayseri prov.: Kayseri prov.: spring Karahalıka at Karahalıka, Pinarbaşı | Pseudophoxinus irati |
| 43  | Stream Zamantı-I | 38.6559, 36.4485 | Turkey, Kayseri prov.: stream Zamantı-I south of Ağşıbeycanlı, south of Pinarbaşı | Capoeta damascina, Squalius seyhanensis, Salmo plathycephalus |
| 44  | Stream Zamantı-II | 38.7566, 36.4131 | Turkey, Kayseri prov.: stream Zamantı-II at Pinarbaşı | Squalius seyhanensis, Oxynoemacheilus samanticus, Oxynoemacheilus seyhanicola |
| 45  | A tributary to Zamantı | 38.5935, 36.4299 | Turkey, Kayseri prov.: a tributary to Zamantı stream between Sanz and Pinarbaşı | Capoeta damascina, Squalius seyhanensis |
| 46  | Stream Pinarbaşı | 38.6204, 36.4397 | Turkey, Kayseri prov.: stream Pinarbaşı at Pinarbaşı | Salmo plathycephalus |
| 47  | Stream Küla | 38.6434, 35.1436 | Turkey, Kayseri prov.: stream Küla at İncesu | Squalius seyhanensis, Athetina boyeri |
| 48  | Stream Şübın | 38.6606, 36.0581 | Turkey, Kayseri prov.: stream Şübın at Bıyun | Esox lucius |
| 49  | Stream Karpuz | 38.7570, 36.4590 | Turkey, Kayseri prov.: stream Karpuz at Pinarbaşı | Squalius seyhanensis, Esox lucius |
| 50  | Stream Sanz | 38.4930, 36.5040 | Turkey, Kayseri prov.: stream Sanz at Sanz | Squalius seyhanensis |
| 51  | Stream Sarnaz | 38.1950, 35.7810 | Turkey, Kayseri prov.: stream Sarnaz at southern Taşı | Oxynoemacheilus samanticus, Garra turcica |
| 52  | Seyhan Dam Lake | 37.0414, 35.3333 | Turkey, Adana prov.: Seyhan Dam Lake | Cyprinus carpio, Luciobarbus pectoralis, Silurus glanis, Sander lucioperca, Acanthobrama onoritis, Squalius kottelati, Oncorhyncus mykiss |
| 53  | River Seyhan | 36.9757, 35.3354 | Adana prov.: river Seyhan below water regulation doors at Yüreyir, south of Adana | Garra lucioperca, Acanthobrama onoritis, Luciobarbus pectoralis, Pseudophoxinus irati, Cobitis aliyae, Oxynoemacheilus cilicicus, Paraphanius similis |
| 54  | Stream Körkün-I | 37.2940, 35.1550 | Turkey, Adana prov.: stream Körkün-I at Hacılı | Garra turcica, Luciobarbus pectoralis, Cobitis aliyae |
| 55  | Stream Körkün-II | 37.1529, 35.1606 | Turkey, Adana prov.: stream Körkün-II at Karakuyu | Capoeta damascina, Garra turcica, Luciobarbus pectoralis, Squalius adanaensis, Oxynoemacheilus seyhanicola |
| 56  | Lake Golbaşı | 37.7981, 36.6616 | Turkey, Adıyaman prov.: Lake Golbaşı at Golbaşı | Alburnus sellal, Pseudophoxinus irati, Oxynoemacheilus cilicicus, Athetina boyeri |
| 57  | Stream Aksu-I | 37.4896, 36.8949 | Turkey, Kahramanmaras prov.: stream Aksu-I at Onikışubat | Capoeta damascina, Capoeta erhanii, Garra turcica, Squalius kottelati, Planiliza abu |
| 58  | Stream Aksu-II | 37.523, 37.3119 | Turkey, Kahramanmaras prov.: stream Aksu-II at Pazarlık (upper Kartalkaya Dam | Capoeta damascina, Garra lucioperca, Luciobarbus pectoralis, Alburnus kotschyi, Chondrostoma ceyhanensis, Oxynoemacheilus seyhanicola, Squalius adanaensis, Oxynoemacheilus cilicicus, Salaria fluviatilis |
| No | Sampling Site | Coordinates | Geographic information | Observed Species |
|----|---------------|-------------|------------------------|------------------|
| 59 | Stream Aksu-III | 37.5390, 37.3480 | Turkey, Kahramanmaraş prov.: stream Aksu-III at Pazarcık | Capoeta damascina, Capoeta ehani, Garra turcica, Oxynoemacheilus evreni, Oxynoemacheilus ceyhanensis, Salaria fluviatilis |
| 60 | Stream Aksu-IV | 37.4452, 37.0207 | Turkey, Kahramanmaraş prov.: stream Aksu-IV at Dulkadiröğlu | Pseudophoxinus hirati |
| 61 | Stream Aksu-V | 37.4690, 37.2310 | Turkey, Kahramanmaraş prov.: stream Aksu-V Pazarcık (Below Kartalıkaş Dam) | Squalius kottelati |
| 62 | Stream Aksu-VI | 37.7904, 37.6263 | Turkey, Adıyaman prov.: stream Aksu-VI connecting Lakes Gölbaşı and Azaplı south of Gölbaşı | Cobitis etekcanae, Oxynoemacheilus evreni, Paraphanius boulengeri |
| 63 | Stream Tekir | 37.8481, 36.6417 | Turkey, Kahramanmaraş prov.: stream Tekir above dam at Tekir, north of Kahramanmaraş | Oxynoemacheilus evreni, Salmo opimus |
| 64 | Stream Göksun-I (Terbüzek) | 38.0317, 36.4736 | Turkey, Kahramanmaraş prov.: stream Göksun-I (Terbüzek) about 2 km north of Göksun | Alburnus kotschyi, Pseudophoxinus hirati, Cobitis evreni, Oxynoemacheilus ceyhanensis, Salmo opimus |
| 65 | Stream Göksun-II (Terbüzek) | 38.0015, 36.4984 | Turkey, Kahramanmaraş prov.: stream Göksun-II (Terbüzek) at 7 km south of Göksun | Oxynoemacheilus ceyhanensis |
| 66 | Stream Aksu | 37.1746, 36.5065 | Turkey, Osmaniye prov.: stream Aksu about 5 km north Kaleiçık | Capoeta damascina, Garra turcica |
| 67 | Stream Firnz | 37.8787, 36.5984 | Turkey, Kahramanmaraş prov.: stream Tekir above dam at Tekir, north of Kahramanmaraş | Salmo opimus |
| 68 | Stream Kayalozu (Firnz) | 37.7588, 36.6940 | Turkey, Kahramanmaraş prov.: stream Kayalozu (Firnz) | Capoeta damascina, Luciobarbus pectoralis, Salmo opimus |
| 69 | Stream Karasu | 37.0606, 36.1122 | Turkey, Osmaniye prov.: stream Karasu at Toprakkale | Alburnus kotschyi, Chondrostoma ceyhanensis, Salaria fluviatilis, Pseudophoxinus ceylanicus |
| 70 | Stream Çelik | 37.6239, 36.5034 | Turkey, Adıyaman prov.: stream Çelik at road south of Gölbaşı | Capoeta damascina, Alburnus kotschyi, Oxynoemacheilus evreni, Oxynoemacheilus ceyhanensis |
| 71 | a tributary to Ceyhan River-I | 37.2215, 36.0471 | Turkey, Osmaniye prov.: a tributary of Ceyhan River-I between Tecirli and Kadıri north of Kocuryu | Capoeta damascina, Capoeta ehani, Pseudophoxinus ceylanicus, Cobitis alyaeae, Oxynoemacheilus ceyhanensis |
| 72 | a tributary to Ceyhan River-II | 37.1247, 36.0486 | Turkey, Adana prov.: a tributary of Ceyhan River-II at Tarat Village | Garra culiciphaga, Gambusia holbrooki |
| 73 | Ceyhan River | 37.1933, 36.0828 | Turkey, Osmaniye prov.: Ceyhan River at north of Sakarcişik Village (fish market) | Luciobarbus pectoralis, Acanthobrama orontis, Acanthobrama thysbeae, Chondrostoma ceyhanensis, Pseudophoxinus zekayi, Salaria kottelati |
| 74 | Stream Geçit | 37.6127, 36.6501 | Turkey, Kahramanmaraş prov.: stream Geçit on road from Kahramanmaraş to Andırın | Capoeta ehani |
| 75 | Spring Çöçelli | 37.2812, 37.1248 | Turkey, Kahramanmaraş prov.: Spring Çöçelli north of Çöçelli | Garra culiciphaga, Pseudophoxinus zekayi, Oxynoemacheilus ceylanicus, Gambusia holbrooki, Paraphanius alexandri |
| 76 | Spring Evri | 37.2662, 37.1018 | Turkey, Kahramanmaraş prov.: Spring Evri south-west of Çöçelli | Garra culiciphaga, Alburnus kotschyi, Pseudophoxinus zekayi, Oxynoemacheilus ceylanicus |
| 77 | Stream Söğütüllü (Seedili) | 38.2546, 37.5330 | Turkey, Kahramanmaraş prov.: stream Söğütüllü 40 km east of Elbistan 38.2546 37.5330 | Capoeta damascina, Garra turcica, Alburnus kotschyi, Oxynoemacheilus evreni, Oxynoemacheilus ceyhanensis, Salaria fluviatilis |
| 78 | Sir Dam Lake | 37.5011, 36.5955 | Turkey, Adana prov.: Sir Dam Lake, Ceyhan River | Silurus glanis |
| 79 | Stream Savrun | 37.3731, 36.0925 | Turkey, Osmaniye prov.: stream Savrun at Kadiri | Garra turcica, Luciobarbus pectoralis, Alburnus opimus, Squalius kottelati |
| 80 | Stream Köprüaşağı | 37.6375, 36.6272 | Turkey, Kahramanmaraş prov.: stream Köprüaşağı upper Sir Dam | Garra turcica |
| 81 | Stream Hurman | 38.5966, 36.9011 | Turkey, Sivas prov.: stream Hurman (Akdere) at Akdere Village | Salaria fluviatilis |
| 82 | Stream Deliçay | 37.3152, 35.8834 | Turkey, Adana prov.: stream Deliçay 20 km southwest of Kadiri | Pseudophoxinus zekayi, Oxynoemacheilus evreni, Oxynoemacheilus ceyhanensis |

**Family Anguillidae Rafinesque, 1815**

**Anguilla anguilla** (Linnaeus, 1758)

**Common local names.** Avrupa yılanlığı / European eel.

**Conservation.** Critically Endangered (CR).

**Material Examined.** FFR 02360 St. 1., – FFR 02361 St. 2., – FFR 02365 St. 3., – Not preserved St. 8., – FFR uncat. St. 15.

**Distribution in the area.** This species is found in the Orontes River drainages and Lake Balık in Turkey. It was also reported in the Ceyhan River (Kara et al. 2010; Erk’akan and Özdemir 2011).
Family Cyprinidae Rafinesque, 1815

**Capoeta barroisi** Lortet, 1894

**Common names.** Benekli Asi sirazı / Orontes scraper.
**Conservation.** Endangered (EN).
**Material examined.** FFR 01725 St. 1., – FSJF 2455 St. 1., – FFR 01890 St. 4., – FFR 01888 St. 9., – FSJF 2364 St. 9., – FSJF 2704 St. 18.
**Distribution in the area.** Orontes River drainages and Balık and Qattinah-I Lake basins in Turkey and Syria. Endemic to only the Orontes River.
**Taxonomic note.** See the taxonomic note of *Capoeta erhani*.

**Capoeta damascina** (Valenciennes, 1842)

**Common names.** Şam sirazı / Damascus scraper.
**Conservation.** Least Concern (LC).
**Material examined.** FSJF 2423 St. 3., – FSJF 2914 St. 5., – FFR 01887 St. 9., – FFR 2352 St. 9., – FSJF 2301 St. 13., – FSJF 2275 St. 14., – FFR 01881 St. 16., – FSJF 2436 St. 17., – FSJF 2705 St. 18., – FFR 01886 St. 33., – FFR 01956 St. 39., – FSJF 2330 St. 41., – FSJF 2540 St. 43., – FSJF 2896 St. 45., – FSJF 01885 St. 59., – FFR 01955 St. 59., – FSJF 2968 St. 71., – FSJF 2456 St. 74.
**Distribution in the area.** Orontes, Seyhan and Ceyhan River drainages and streams Çakıtsuyu-I, Üçürgesuyu-I (Seyhan River) in Turkey. It was also reported from the Euphrates River (Kaya 2019).

**Capoeta erhani** Turan, Kottelat & Ekmecki, 2008

**Common names.** Benekli Akdeniz sirazı* / Mediterranean scraper*.
**Conservation.** Least Concern (LC).
**Material examined.** FFR 01885 St. 59., – FFR 01955 St. 59., – FFR 01883 St. 59., – FFR 01952 St. 59., – FSJF 2968 St. 71., – FSJF 3512 St. 53., – FSJF 2403 St. 53., – FFR 02481 St. 58., – FFR 4027 St. 72., – FSJF 2607 St. 75., – FFR 2496 St. 76.

**Carasobarbus chantrei** (Sauvage, 1882)

**Common names.** Asi himrisi* / Orontes himri*.
**Conservation.** Near Threatened (NT).
**Material examined.** FFR 00400 St. 1., – FFR 00427 St. 2., – FFR uncat., St. 3., – FFR uncat., St. 8., – FFR 00407 St. 9., – FSJF 2311 St. 9., – FSJF 2706 St. 18., – FSJF 2676 St. 21., – FSJF 2662 St. 31.
**Distribution in the area.** Orontes River drainages and Balık and Qattinah-I Lake basins in Turkey and Syria. Endemic to only the Orontes River.

**Carassius gibelio** (Bloch, 1782)

**Common names.** Havuz balığı / Prussian carp.
**Conservation.** Not Evaluated (NE).
**Material examined.** FFR uncat. St. 3., – FFR uncat., St. 8., – FFR 00407 St. 9.
**Distribution in the area.** This species is found in the Orontes River drainages. It was also recorded from the Seyhan River (Erk’akan and Özdemir 2011; Ergüden Alagöz and Göksu 2012); even so, it was not observed in the Seyhan during the surveys.

**Cyprinus carpio** Linnaeus, 1758

**Common names.** Adi sazan / Common carp.
**Conservation.** Vulnerable (VU).
**Material examined.** FFR 02750 St. 9., – Not preserved St. 52.
**Distribution in the area.** Orontes River drainages and Seyhan Dam Lake in Turkey. It was also recorded in the Ceyhan River (Kara et al. 2010).

**Garra caudomaculata** (Battalgil, 1942)

**Common names.** Altın saz balığı* / Golden minnow.
**Conservation.** Least Concern (LC).
**Material examined.** FSJF 2433 St. 3., – FSJF 2655 St. 20., – FSJF 2755 St. 22., – FSJF 2736 St. 28., – FSJF 2669 St. 30., – FSJF 2761 St. 31.
**Distribution in the area.** Orontes River drainages and Shadha Lake basin in Turkey and Syria. Endemic to only the Orontes River.

**Garra culiciphaga** (Pellegrin, 1927)

**Common names.** Kırmızı çizgili saz balığı* / Red stripe barb.
**Conservation.** Least Concern (LC).
**Material examined.** FFR 02480 St. 33., – FSJF 2403 St. 53., – FSJF 3512 St. 53., – FFR 02481 St. 58., – FFR 4027 St. 72., – FSJF 2607 St. 75., – FFR 2496 St. 76.
**Distribution in the area.** Seyhan and Ceyhan River drainages in Turkey.

**Garra** sp.

**Material examined.** FSJF 2414 St. 3., – FFR 04032 St. 8., – FFR 04010 St. 9., – FSJF 2335 St. 9., – FSJF 2449 St. 11., – FSJF 2302 St. 13., – FFR 04007 St. 16., – FSJF 2415 St. 17., – FSJF 2699 St. 18., – FSJF 2671 St. 21., – FSJF 2684 St. 22., – FSJF 2695 St. 23., – FSJF 2667 St. 29., – FSJF 2663 St. 31.

**Distribution in the area.** Seyhan and Ceyhan River drainages in Turkey and Syria.

**Taxonomic notes.** Geiger et al. (2014) genetically identified some of the Orontes populations as *Garra* sp., Bayçelebi et al. (2018) supported this view and reported that these populations have not been defined yet. A detailed study is needed to reveal the taxonomic status of these populations.

**Garra turcica** Karaman, 1971

**Common names.** Seyhan doktor balığı / Seyhan doctor fish*.

**Conservation.** Not Evaluated (NE).

**Material examined.** FFR 00305 St. 1., – FFR uncat. St. 2., – FFR 00346 St. 3., – FFR 00345 St. 4., – FFR 00345 St. 9., – FSJF 2697 St. 18., – FFR 00347 St. 33., – FSJF 2424 St. 34., – Not preserved, St. 38., – FSJF 2329 St. 40., – FFR 00300 St. 52., – FFR 00301 St. 53., – FFR 00321 St. 54., – FSJF 2450 St. 55., – FFR 00358 St. 58., – FFR 00344 St. 68., – FSJF 2988 St. 73., – FSJF 2854 St. 79.

**Distribution in the area.** Seyhan and Ceyhan River drainages and Qattinah-I Lake basin in Turkey and Syria.

**Family Leuciscidae Bonaparte, 1835**

**Acanthobrama orontis** Berg, 1949

**Common names.** Asi akçapağı* / Orontes bream*.

**Conservation.** Not Evaluated (NE).

**Material examined.** FFR 2658 St. 20., – FSJF 2737 St. 30., – FSJF 2661 St. 31.

**Distribution in the area.** This species is distributed in the lower parts of the Orontes River drainages in Syria. In addition, *Garra variabilis* shows wide distributions in the Euphrates and Tigris rivers in Turkey.

**Acanthobrama thisbeae** Freyhof & Özuluğ, 2014

**Common names.** Ceyhan akçapağı* / Ceyhan bream*.

**Conservation.** Not Evaluated (NE).

**Material examined.** FFR uncat., St. 5., – FSJF 2987 St. 73.

**Distribution in the area.** The lower part of the Ceyhan and Orontes River drainages.

**Taxonomic notes.** Freyhof and Özuluğ (2014) suspected that *Aspius vorax* (Bostancı 2006: 84) originated from the stream Afrin (Orontes River); it might be *A. thisbeae*. The material examined by Bostancı (2006) in FFR belongs to the species *A. thisbeae*.

**Alburnus kotschyi** Steindachner, 1863

**Common names.** İskenderun inci balığı* / Iskenderun bleak.

**Conservation.** Least Concern (LC).

**Material examined.** FFR 09999 St. 35., – FSJF 504 St. 40., – FFR 04665 St. 58., – FFR 00868 St. 64., – FSJF 2638 St. 64., – FFR 04663 St. 69., – FSJF 2570 St. 70., – FSJF 2497 St. 76., – FSJF 2901 St. 77., – FSJF 2856 St. 79.
Distribution in the area. Seyhan and Ceyhan River drainages, in addition to coastal streams between Ceyhan and Arsuz (Freyhof et al. 2018b).

*Alburnus magnificus* Freyhof & Turan, 2019

Common names. Afrin inci balığı* / Afrin bleak*.

Conservation. Not Evaluated (NE).

Material examined. FFR 00998 St. 4., – FSJF 2915 St. 5., – FFR 00990 St. 7., – FSJF 2298 St. 13., – FSJF 2412 St. 17.

Distribution in the area. The lower part of the Orontes River drainage in Turkey; most probably it occurs also in Syria as the stream Afrin passes from Syrian territory (Freyhof and Turan 2019). Endemic to only the Orontes River.
Figure 3. Leuciscidae species of the northeastern Mediterranean Sea Basin of Turkey. a. *Acanthobrama orontis*, Seyhan Dam Lake; b. *A. thisbeae*, stream Afrin; c. *Alburnus kotschi*, stream Üçürgesuyu-III; d. *A. magnificus*, stream Bedirge; e. *A. orontis*, stream Karasu-II; f. *A. sellal*, Lake Gölbaş; g. *Chondrostoma kinzelbachi*, stream Karasu-I; h. *C. ceyhanensis*, stream Karasu-V; i. *Leuciscus vorax*, Orontes River-VII photo: JF; j. *Pseudophoxinus ciliicus*, stream Karasu-V; k. *P. firati*, spring Karahalka; l. *P. libani*, Lake Balık; m. *P. turani*, stream İncesu; n. *P. zekayi*, Lake Gölbaş; o. *P. zeregi*, stream Hanne; p. *Squalius adanaensis*, stream Üçürgesuyu-I; r. *S. seyhanensis*, stream Zamantı-II; s. *S. kottelati*, stream Karasu-II.
**Taxonomic notes.** *Alburnus qalilus* (Krupp 1992) is distributed in the coastal streams in Syria. Breicikligil et al. (2016) reported *A. qalilus* from the Orontes River in Turkey. However, Freyhof and Turan (2019) revised the genus of *Alburnus* from the lower part of the Orontes and restricted *A. qalilus* to Syria.

*Alburnus orontis* Sauvage, 1882

- **Common names.** Asi incisi* / Orontes bleak.
- **Conservation.** Vulnerable (VU).
- **Material examined.** FFR 04602 St. 2., – FSJF 2393 St. 3., – FFR 00902 St. 6., – FFR 04696 St. 8., – FSJF 2963 St. 10., – FSJF 2401 St. 11., – FSJF 2751 St. 22., – FSJF 2751 St. 30.
- **Distribution in the area.** Orontes River drainages in Turkey and Syria. Endemic to only the Orontes River.

*Alburnus sellal* Heckel, 1843

- **Common names.** Doğu incisi* / Eastern shah kuli.
- **Conservation.** Least Concern (LC).
- **Material examined.** FFR 04697 St. 56.
- **Distribution in the area.** It is only found in the Lake Gölbaşı basin that connected with the stream Aksu (upper part of Ceyhan River). However, this species is widely distributed in the inland waters of eastern Turkey (Freyhof et al. 2018a).

*Chondrostoma kinzelbachi* Krupp, 1985

- **Common names.** Asi kababurun* / Orontes nase.
- **Conservation.** Endangered (EN).
- **Material examined.** FFR 2033 St. 1., – FFR 2018 St. 3., – FFR 2081 St. 8., – FSJF 2841 St. 12.
- **Distribution in the area.** Known from only the Orontes drainages and Lake Balık basin in Turkey. Endemic to only the Orontes River.

*Chondrostoma ceyhanensis* Küçük, Turan, Güçlü, Mutlu & Çiftci, 2017

- **Common names.** Ceyhan kababurunu* / Ceyhan nase*.
- **Conservation.** Not Evaluated (NE).
- **Material examined.** FFR 02057 St. 33., – FFR 02076 St. 39., – FSJF 2346 St. 40., – FFR 02056 St. 58., – FFR 02075 St. 69., – FSJF 2990 St. 73.
- **Distribution in the area.** Ceyhan and Seyhan River drainages and River Berdan, a watershed in the Mediterranean Sea (Küçük et al. 2017).

*Leuciscus vorax* (Heckel, 1843)

- **Common names.** Sis balığı / Tigris asp.

*Pseudophoxinus ciliicus* Sac, Özuluğ, Geiger & Freyhof, 2019

- **Common names.** Kilikya ot balığı* / Cilician spring minnow*.
- **Conservation.** Not Evaluated (NE).
- **Material examined.** FSR 1495 St. 25.
- **Distribution in the area.** The lower part of the Seyhan and Ceyhan River drainages, also the stream Arsuz (Mediterranean Sea Basin) in Turkey (Sac et al. 2019).

*Pseudophoxinus firati* Bogutskaya, Küçük & Atalay, 2006

- **Common names.** Firat ot balığı* / Euphrates spring minnow.
- **Conservation.** Endangered (EN).
- **Material examined.** FFR 03308 St. 42., – FSJF 4052 St. 60., – FFR 03283 St. 64.
- **Distribution in the area.** *Pseudophoxinus firati* is found in the streams Göksun and Aksu (Ceyhan) and spring Karahalka (Seyhan). It is also known from the headwaters of the Euphrates (Sac et al. 2019).

*Pseudophoxinus libani* (Lortet, 1883)

- **Common names.** Ası ot balığı* / Orontes spring minnow.
- **Conservation.** Least Concern (LC).
- **Material examined.** FFR 03314 St. 1., – FSJF 2391 St. 3., – FSJF 2756 St. 19., – FSJF 2646 St. 20., – FSJF 2641 St. 21., – FSJF 2757 St. 22., – FSJF 2644 St. 24., – FSJF 2645 St. 28., – FSJF 2647 St. 30., – FSJF 2643 St. 31.
- **Distribution in the area.** Orontes River drainages and Lake Balık and Qattinah Lake basins in Turkey and Syria.

**Taxonomic note.** According to morphological and molecular data (COI), *P. libani* and *P. kervillei* were conspecific and *P. kervillei* was a junior synonym of *P. libani* (Bariche and Freyhof 2016).

*Pseudophoxinus turani* Küçük & Güçlü, 2014

- **Common names.** İncesu ot balığı* / İncesi spring minnow.
- **Conservation.** Not Evaluated (NE).
- **Material examined.** FFR 03286 St. 9., – FSJF 2964 St. 10., – FSJF 2277 St. 14., – FFR 03282 St. 14.
- **Distribution in the area.** Streams İncesi and Karasu (outflow of TahtaKöprü Dam Lake) in Turkey. Endemic to only the Orontes River.
**Pseudophoxinus zekayi** Bogutskaya, Küçük & Atalay, 2006

**Common names.** Ceyhan ot balığı* / Ceyhan spring minnow.

**Conservation.** Vulnerable (VU).

**Material examined.** FFR 03315 St. 56., – FSJF 2985 St. 73., – FFR 3313 St. 75., – FSJF 2461 St. 75., – FSJF 2478 St. 76., – FSJF 2961 St. 82.

**Distribution in the area.** Springs Çöçelli and Evri and the Lake Gölbaşı basin (Ceyhan River basin). Endemic to only the Ceyhan River.

**Pseudophoxinus zeregi** (Heckel, 1843)

**Common names.** Kueik ot balığı* / Qweik spring minnow*.

**Conservation.** Least Concern (LC).

**Material examined.** FSJF 2430 St. 3., – FSJF 2297 St. 13., – FFR 03312 St. 15., – FSJF 2746 St. 27., – FSJF 2749 St. 30.

**Distribution in the area.** Orontes River drainages in Turkey and Syria. It was also reported from the Qweik River and small coastal streams in Syria (Saç et al. 2019).

**Squalius adanaensis** Turan, Kottelat & Doğan, 2013

**Common names.** Adana tatlısu kefali* / Adana chub.

**Conservation.** Near Threatened (NT).

**Material examined.** FFR 06279 St. 33., – FFR 01995 St. 35., – FSJF 2939 St. 36., – FSJF 2419 St. 34., – FFR 00777 St. 40., – FSJF 2382 St. 55.

**Distribution in the area.** The lower part of the Seyhan River drainages in Turkey. Endemic to only the Seyhan River.

**Squalius kottelati** Turan, Yilmaz & Kaya, 2009

**Common names.** Asi tatlısu kefali* / Orontes dace*.

**Conservation.** Near Threatened (NT).

**Material examined.** FFR 00778 St. 2., – FFR 06231 St. 3., – FFR 01995 St. 35., – FFR 01567 St. 9., – FSJF 2962 St. 10., – FSJF 2842 St. 12., – Not preserved St. 52., – FFR St. .57., – FFR 06280 St. 57., – FFR 00665 St. 61., – FFR 00567 St. 73., – FSJF 2986 St. 73., – FSJF 2855 St. 79.

**Distribution in the area.** Seyhan, Ceyhan and Orontes River drainages in Turkey. It may occur in the upper part of the Orontes in Syria.

**Squalius seyhanensis** Turan, Kottelat & Doğan, 2013

**Common names.** Seyhan tatlısu kefali* / Seyhan chub*.

**Conservation.** Data Deficient (DD).

**Material examined.** FSJF 2539 St. 43., – FFR 01994 St. 44., – FFR 06275 St. 44., – FSJF 2982 St. 44., – FSJF 2895 St. 45., – FFR 00758 St. 47., – FFR 00730 St. 49., – FFR01993 St. 50.

**Distribution in the area.** The upper part of the Seyhan River drainages in Turkey. It was also reported in the Euphrates River drainages (Turan et al. 2017).

**Pseudophoxinus zekayi** Bogutskaya, Küçük & Atalay, 2006

**Common names.** Ceyhan ot balığı* / Ceyhan spring minnow.

**Conservation.** Vulnerable (VU).

**Material examined.** FFR 03315 St. 56., – FSJF 2985 St. 73., – FFR 3313 St. 75., – FSJF 2461 St. 75., – FSJF 2478 St. 76., – FSJF 2961 St. 82.

**Distribution in the area.** Springs Çöçelli and Evri and the Lake Gölbaşı basin (Ceyhan River basin). Endemic to only the Ceyhan River.

**Pseudophoxinus zeregi** (Heckel, 1843)

**Common names.** Kueik ot balığı* / Qweik spring minnow*.

**Conservation.** Least Concern (LC).

**Material examined.** FSJF 2430 St. 3., – FSJF 2297 St. 13., – FFR 03312 St. 15., – FSJF 2746 St. 27., – FSJF 2749 St. 30.

**Distribution in the area.** Orontes River drainages in Turkey and Syria. It was also reported from the Qweik River and small coastal streams in Syria (Saç et al. 2019).

**Squalius adanaensis** Turan, Kottelat & Doğan, 2013

**Common names.** Adana tatlısu kefali* / Adana chub.

**Conservation.** Near Threatened (NT).

**Material examined.** FFR 06279 St. 33., – FFR 01995 St. 35., – FSJF 2939 St. 36., – FSJF 2419 St. 34., – FFR 00777 St. 40., – FSJF 2382 St. 55.

**Distribution in the area.** The lower part of the Seyhan River drainages in Turkey. Endemic to only the Seyhan River.

**Squalius kottelati** Turan, Yilmaz & Kaya, 2009

**Common names.** Asi tatlısu kefali* / Orontes dace*.

**Conservation.** Near Threatened (NT).

**Material examined.** FFR 00778 St. 2., – FFR 06231 St. 3., – FFR 01995 St. 35., – FFR 01567 St. 9., – FSJF 2962 St. 10., – FSJF 2842 St. 12., – Not preserved St. 52., – FFR St. .57., – FFR 06280 St. 57., – FFR 00665 St. 61., – FFR 00567 St. 73., – FSJF 2986 St. 73., – FSJF 2855 St. 79.

**Distribution in the area.** Seyhan, Ceyhan and Orontes River drainages in Turkey. It may occur in the upper part of the Orontes in Syria.

**Squalius seyhanensis** Turan, Kottelat & Doğan, 2013

**Common names.** Seyhan tatlısu kefali* / Seyhan chub*.

**Conservation.** Data Deficient (DD).

**Material examined.** FSJF 2539 St. 43., – FFR 01994 St. 44., – FFR 06275 St. 44., – FSJF 2982 St. 44., – FSJF 2895 St. 45., – FFR 00758 St. 47., – FFR 00730 St. 49., – FFR01993 St. 50.

**Distribution in the area.** The upper part of the Seyhan River drainages in Turkey. It was also reported in the Euphrates River drainages (Turan et al. 2017).

**Family Cobitidae Swainson, 1838**

**Cobitis aliyeae** Freyhof, Bayçelebi & Geiger, 2018

**Common names.** Adana taşemeni* / Adana spined loach*.

**Conservation.** Not Evaluated (NE).

**Material examined.** FSJF 2427 St. 53., – FFR 05506 St. 54., – FSJF 2969 St. 71.

**Distribution in the area.** The lower part of the Seyhan and Ceyhan River drainages in Turkey (Freyhof et al. 2018c).

**Cobitis anabelae** Freyhof, Bayçelebi & Geiger, 2018

**Common names.** Orontes spined loach* / Asi taşemeni*.

**Figure 4.** Cobitidae species of the northeastern Mediterranean Sea Basin of Turkey and Syria. a. *Cobitis aliyeae*, stream Üçürge-suyu-I; b. *C. anabelae*, stream Karasu-I; c. *C. erkakanae*, stream Aksu-IV, connecting Lakes Gölbaşı photo: JF; d. *C. evreni*, stream Göksun-I; e. *C. levantina*, stream Nahr al Barid photo: JF.
Conservation. Not Evaluated (NE).
Material examined. FSJF 2399 St. 3., – FFR 05528 St. 6., – FFR 05564 St. 8., – FSJF 2428 St. 11., – FSJF 2674 St. 21.
Distribution in the area. Orontes River drainages in Turkey and Syria. Endemic to only the Orontes River.

*Cobitis erkakanae* Freyhof, Bayçelebi & Geiger, 2018

Common names. Gölbaşı spined loach* / Gölbaşı taşemeni*.
Conservation. Not Evaluated (NE).
Material examined. FSJF 2399 St. 3., – FFR 05528 St. 6., – FFR 05564 St. 8., – FSJF 2428 St. 11., – FSJF 2674 St. 21.
Distribution in the area. Orontes River drainages in Turkey and Syria. Endemic to only the Orontes River.

*Cobitis evreni* Erk’Akan, Özeren & Nalbant, 2008

Common names. Ceyhan spined loach / Ceyhan taşemeni*.
Conservation. Endangered (EN).
Material examined. FFR 05530 St. 64.
Distribution in the area. It is only known from the Lake Gölbaşı basin (Ceyhan) in Turkey. Endemic to only the Ceyhan River.

*Cobitis levantina* Krupp & Moubayed, 1992

Common names. Orontes spined loach/ Asi taşemeni*.
Conservation. Not Evaluated (NE).
Material examined. FSJF 2747 St. 30.
Distribution in the area. The upper part of the Orontes River drainages in Syria.

Family Nemacheilidae Regan, 1911

*Oxynoemacheilus ceyhanensis* (Erk’akan, Nalbant & Özeren, 2007)

Common names. Elbistan çöpçü balığı* / Elbistan loach.
Conservation. Data Deficient (DD).
Material examined. FFR 01479 St. 65., – FSJF 2967 St. 71., – FSJF 2900 St. 77., – FSJF 2960 St. 82.
Distribution in the area. The upper part of the Ceyhan River drainages in Turkey. Endemic to only the Ceyhan River.

*Oxynoemacheilus cillicicus* Kaya, Turan, Bayçelebi, Kalayci & Freyhof, 2020

Common names. Kilikya çöpçü balığı* / Cilicia loach*.
Conservation. Not Evaluated (NE).

*Oxynoemacheilus evreni* (Erk’akan, Nalbant & Özeren, 2007)

Common names. Ceyhan çöpçü balığı* / Ceyhan loach*.
Conservation. Least Concern (LC).
Material examined. FFR 1598 St. 58., – FFR 01490 St. 59., – FSJF 2503 St. 63., – FSJF 2640 St. 64., – FSJF 2567 St. 70., – FSJF 2897 St. 77., – FSJF 2959 St. 82.
Distribution in the area. Ceyhan River drainages. Endemic to only the Ceyhan River.

*Oxynoemacheilus hamwii* (Krupp & Schneider, 1991)

Common names. Asi çöpçü balığı* / Orontes loach*.
Conservation. Endangered (EN).
Material examined. FFR 1501 St. 2., – FFR 01497 St. 5., – FFR 1485 St. 7., – FFR 2395 St. 11., – FSJF 2300 St. 13., – FFR 15556 St. 15., – FSJF 2698 St. 18., – FSJF 2656 St. 20., – FSJF 2662 St. 21., – FSJF 2682 St. 22., – FSJF 2748 St. 24., – FSJF 2713 St. 26., – FSJF 2745 St. 27., – FSJF 2666 St. 29., – FSJF 2750 St. 30.
Distribution in the area. Orontes River drainages and the Lake Shadha basin in Turkey and Syria. Endemic to only the Orontes River.

*Oxynoemacheilus namiri* (Krupp & Schneider, 1991)

Common names. Akdeniz çöpçü balığı*/ Levantine loach.
Conservation. Least Concern (LC).
Material examined. FFR 01502 St. 2., – FFR 01497 St. 5., – FFR 01503 St. 6., – FFR 1485 St. 7., – FSJF 2395 St. 11., – FSJF 2300 St. 13., – FFR 15556 St. 15., – FSJF 2698 St. 18., – FSJF 2656 St. 20., – FSJF 2662 St. 21., – FSJF 2682 St. 22., – FSJF 2748 St. 24., – FSJF 2713 St. 26., – FSJF 2745 St. 27., – FSJF 2666 St. 29., – FSJF 2750 St. 30.
Distribution in the area. Orontes River drainages and the Lake Shadha basin in Turkey and Syria. Endemic to only the Orontes River.

*Oxynoemacheilus samanticus* (Banarescu & Nalbant, 1978)

Common names. Zamanti çöpçü balığı / Zamanti loach*.
Conservation. Least Concern (LC).
Material examined. FSJF 2983 St. 44., – FFR 15561 St. 51.

Distribution in the area. Stream Zamantı and Sarnaz, the upper Seyhan River drainages. The species is also widespread in Kızılırmak River drainages and stream Mancılık (Euphrates River) (Freyhof et al. 2019).

Oxynoemacheilus seyhanensis (Bănărescu, 1968)

Common names. Seyhan loach* / Seyhan çöpçü balığı*.
Conservation. Critically Endangered (CR).
Material examined. FSJF 2984 St. 44.

Distribution in the area. It is only found in the upper Seyhan River drainages. However, it is known from the Kızılırmak River drainages in Turkey. Oxynoemacheilus kosswigi is known from the Kızılırmak drainages and has recently been synonymised with O. seyhanensis (Sungur 2020).

Oxynoemacheilus seyhanicola (Erk’akan, Nalbant & Özeren, 2007)

Common names. Adana çöpçü balığı* / Adana loach*.
Conservation. Endangered (EN).
Material examined. FFR 01499 St. 37., – FFR 01492 St. 38., – FFR 15522 St. 39., – FSJF 2327 St. 40., – FSJF 2377 St. 55.

Distribution in the area. The lower part of the Seyhan River drainages in Turkey. Endemic to only the Seyhan River.

Family Bagridae Bleeker, 1858

Mystus pelusius (Solander, 1794)

Common names. Mezopotamya kedi balığı*/ Tigris mystus.
Conservation. Least Concern (LC).
Material examined. FFR 02732 St. 1.

Distribution in the area. Known from only the Lake Balık in the area, but it occurs in the Tigris, Euphrates and Queiq River drainages (Kaya et al 2016).

Family Siluridae Rafinesque, 1815

Silurus glanis Linnaeus, 1758

Common names. Yayın / Wels catfish.
Conservation. Least Concern (LC).
Material examined. Not preserved St. 52., – Not preserved St. 78.

Distribution in the area. Seyhan Dam and Sır Dam lakes (Ceyhan). It is also widespread in the Anatolia.
Family Clariidae

*Clarias gariepinus* (Burchell, 1822)

**Common names.** Kara balık / North African catfish.
**Conservation.** Least Concern (LC).
**Material examined.** FFR 05700 St. 6., – FFR uncat., St. 8., – FFR uncat., St. 15., – FSJF 2381 St. 17.
**Distribution in the area.** The upper part of the Orontes River drainages in Turkey and it might be found in Syria.

Family Esocidae Rafinesque, 1815

*Esox lucius* Linnaeus, 1758

**Common names.** Turna / Pike.
**Conservation.** Least Concern (LC).
**Material examined.** FFR 04200 St. 48., – FFR 04201 St. 49.
**Distribution in the area.** Streams Şıvgın and Karagöz, Seyhan River in Turkey.

Family Salmonidae Jarocki or Schinz, 1822

*Salmo chilo* Turan, Kottelat & Engin, 2012

**Common names.** Akdere alası*/Akdere trout*.
**Conservation.** Vulnerable (VU).
**Material examined.** FFR 03055 St. 81.
**Distribution in the area.** Stream Hurman, an uppermost drainage of the Ceyhan River. Endemic to only the Ceyhan River.

*Salmo labecula* Turan, Kottelat & Engin, 2012

**Common names.** Seyhan alası*/Seyhan trout.
**Conservation.** Endangered (EN).
**Material examined.** FFR 03057 St. 32.
**Distribution in the area.** Stream Ecemiş in the drainage of the Seyhan River.

*Salmo opimus* Turan, Kottelat & Engin, 2012

**Common names.** Ceyhan alası*/Ceyhan trout*.
**Conservation.** Endangered (EN).
**Material examined.** FSJF 2504 St. 63., – FFR 03051 St. 67., – FFR 03050 St. 68.
**Distribution in the area.** The middle part of the Ceyhan River drainages.

*Salmo platycephalus* Behnke, 1968

**Common names.** Yassıbaş ala*/Flathead trout.
**Conservation.** Endangered (EN).

Family Atherinidae Risso, 1827

*Atherina boyeri* Risso, 1810

**Common names.** Gümüş balığı / Big-scale sand smelt.
Conservation. Least Concern (LC).

Material examined. FFR uncat., St. 8., – FSJF 2313 St. 9., – FFR uncat., St. 9., – FFR 04150 St. 47., – FFR 04152 St. 56.

Distribution in the area. Orontes River drainages, stream Kışla (Seyhan) and the Lake Gölbaşı basin (Ceyhan).

Family Poeciliidae Bonaparte, 1831

Gambusia holbrooki Girard, 1859

Common names. Sivrisinek balığı / Eastern mosquito fish.

Conservation. Least Concern (LC).

Material examined. FSJF 2398 St. 3., – FSJF 20495 St. 6., – FSJF 2321 St. 9., – FSJF 2299 St. 13., – FFR 02493 St. 16., – Not preserved St. 72., – FFR 15004 St. 75.

Distribution in the area. Orontes River drainages, a tributary of Ceyhan River and spring Çöçelli (Ceyhan River).

Family Aphanidae Nardo, 1827

Paraphanius alexandri (Aksiray, 1948)

Common names. İskenderun dişlisazancığı / İskenderun pompano.

Conservation. Not Evaluated (NE).

Material examined. FFR 08660 St. 75., – FSJF 2605 St. 75.

Distribution in the area. It is widespread in the Ceyhan River drainage, from the coastal streams in the Arsuz (İskenderun) to the mainsprings of the Ceyhan River in Elbistan.

Paraphanius boulengeri (Aksiray, 1948)

Common names. Gölbashi dişlisazancığı / Gölbashi killi-fish.

Conservation. Not Evaluated (NE).

Material examined. FFR 08662 St. 62., – FSJF 2506 St. 62., – FSJF 3737 St. 62.

Distribution in the area. The species is known from the Lake Gölbashi. Endemic to only the Ceyhan River.
**Paraphanius mento** (Heckel, 1843)

**Common names.** Mavi benekli dişlisazancık / Pearl-spotted killifish.

**Conservation.** Least Concern (LC).

**Material examined.** FSJF 2758 St. 19., – FSJF 2657 St. 20., – FSJF 2683 St. 22., – FSJF 2659 St. 31.

**Distribution in the area.** The upper part of the Orontes River drainages and the Lake Qattinah basin in Syria.

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**Paraphanius orontis** (Aksiray, 1948)

**Common names.** Asi dişlisazancığı* / Orontes killifish*.

**Conservation.** Not Evaluated (NE).

**Material examined.** FFR 08642 St. 3., – FSJF 2431 St. 3., – FSJF 2753 St. 30.

**Distribution in the area.** Orontes River and stream Nahr al Barid in Turkey and Syria.

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**Paraphanius similis** (Aksiray, 1948)

**Common names.** Seyhan noktalı dişlisazancığı* / Seyhan spotted killifish*.

**Conservation.** Not Evaluated (NE).

**Material examined.** FSJF 2434 St. 53.

**Distribution in the area.** The species is widespread in the Seyhan River drainage, whereas some landlocked populations exist in central Anatolia.

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**Sander lucioperca** (Linnaeus, 1758)

**Family Percidae** Rafinesque, 1815

**Common names.** Sudak / Pike-perch.

**Conservation.** Least Concern (LC).

**Material examined.** Not preserved St. 52.

**Distribution in the area.** Seyhan Dam Lake in Turkey.

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**Chelon sp.**

**Family Mugilidae** Jarocki, 1822

**Material examined.** FSJF 2425 St. 17.

**Distribution in the area.** The species is known from the stream Yıldırım (Orontes River).

**Taxonomic note.** The species has not been identified because there is insufficient material. Advanced genetic and morphological studies are needed to reveal the taxonomic status of the species.

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**Planiliza abu** (Heckel, 1843)

**Common names.** Mezopotamya kefali* / Abu mullet.

**Conservation.** Least Concern (LC).

**Material examined.** FFR 027583 St. 1., – FFR 2587 St. 4., – FFR 02588 St. 6. – FSJF 2396 St. 11., – FSJF 2668 S St. 29., – FFR 2586 St. 57.

**Distribution in the area.** Orontes River drainages and Balık and Qattinah Lake basins in Turkey and Syria.
Family Cichlidae Bonaparte, 1835

*Coptodon zillii* (Gervais, 1848)

**Common names.** Tilapia / Redbelly tilapia.

**Conservation.** Least Concern (LC).

**Material examined.** FFR 06800 St. 1., – FSJF 2413 St. 17.

**Distribution in the area.** It was found in the Lake Balık and stream Yıldırım, Orontes River in Turkey. According to the literature, it was reported from the coastal streams and the Orontes River in Syria (Borkenhagen and Freyhof 2009).

*Sarotherodon galilaeus* (Linnaeus, 1758)

**Common names.** Mango tilapia* / Mango Tilapia.

**Conservation.** Not Evaluated (NE).

**Material examined.** FSJF 2664 St. 31.

**Distribution in the area.** It is found in a spring, south of Qala’at al Jarras in Syria.

*Tristramella simonis* (Günther, 1864)

**Common names.** Kısa çeneli tilapia* / Short jaw tilapia.

**Conservation.** Vulnerable (VU).

**Material examined.** FSJF 2665 St. 31.

**Distribution in the area.** It is found in a spring south of Qala’at al Jarras. It is also known from Levantine and lakes Tiberias and Muzarib (Borkenhagen and Freyhof 2009).

Family Blenniidae Rafinesque, 1810

*Salaria fluviatilis* (Asso, 1801)

**Common names.** Horozbina / Freshwater blenny.

**Conservation.** Least Concern (LC).

**Material examined.** FFR 04251 St. 33., – Not preserved St. 38., – FFR 04256 St. 39., – FSJF 2453 St. 46., – FFR 04254 St. 58., – FFR 04250 St. 59., – FFR 04253 St. 69.

**Distribution in the area.** It is known from the Seyhan and Ceyhan River drainages.

**Taxonomic notes.** The genus of *Salaria* is represented with a single species *Salaria fluviatilis* in Turkey. This genus should be compared with different populations, which should be reviewed, both morphologically and molecularly, to clarify the taxonomy.

**Discussion**

As a result of this study, the current fish fauna conditions of the Orontes, Seyhan and Ceyhan rivers were evaluated. Sixty-seven species belonging to 17 families of inland water fishes were reported from the Seyhan (28 species), Ceyhan (27 species) and Orontes (33 species) river drainages in Turkey and Syria. Almost all the fish species were recorded in the previous studies for the region, except *Tinca tinca* (see Table 2). This species was reported from the Seyhan River (Erk’akan and Özdemir 2011; Ergüden Alagöz and Göksu 2012). The species’ absence may be explained by the hunting method, habitat selection or season. *Acanthobrama centisquama* was originally described from Orontes (Asi) drainage by Heckel (1843) but not recorded again for a long time (Freyhof and Özuluğ 2014). Then also this study period, this species could not be observed in this research area. It might be extinct or has a very localised distribution in the Orontes River.

Four species of *Alburnus* are known from the Seyhan, Ceyhan and Orontes rivers. Three of them have been obtained in the study period while *A. adanensis* has not been caught. Bostancı (2006) and Erk’akan and Özdemir (2011) identified an *Alburnus* species from the Seyhan River as *A. adanensis*. Birecikligil et al. (2016) reported that *A. adanensis* was a synonym of *A. sellal*. Freyhof et al. (2018b) accepted *A. adanensis* as a valid species and ed.
Table 2. Former and current fish records from the Orontes, Seyhan and Ceyhan River drainages.

| Orontes River | Bostancı 2006 | Ozcan 2013 | This Study |
|---------------|--------------|------------|------------|
| Anguilla anguilla | Anguilla anguilla | Anguilla anguilla | Anguilla anguilla |
| Capoeta barroisi | Capoeta barroisi | Capoeta barroisi | Capoeta barroisi |
| Capoeta damascina, C. angorae | Capoeta damascina | Capoeta damascina | Capoeta damascina |
| Carasobarbus luteus | Carasobarbus luteus | Carasobarbus chantevi | Carasobarbus chantevi |
| – | – | Carassius auratus auratus | Carassius gibelio |
| – | – | – | Cyprinus carpio |
| Garra rufa | Garra rufa | Garra sp. | Garra caudomaculata |
| – | – | Garra vanantilis |
| Barbus pectoralis | Luciobarbus pectoralis | Luciobarbus pectoralis |
| Aspius vorax | Acanthobrama marmid | Acanthobrama thiibeaie |
| Albunomiodes bipunctatus | – | Albuminus magnificus |
| Albunomus orontis | – | Albunomus orontis |
| Chondrostoma kinkelbachi | Chondrostoma kinkelbachi | Chondrostoma kinkelbachi |
| Squalius lepidus | – | – | Squalius koffeltal |
| – | – | – | Pseudophoxinus brunii |
| – | – | – | Pseudophoxinus libani |
| – | – | – | Pseudophoxinus zeregi |
| Cebitis levantina | Cebitis levantina | Cebitis anabelae |
| – | – | Cebitis levantina |
| – | – | Oxyromecheleus argyrogramma | Oxyromecheleus hamwii |
| Barbatula panthera | – | – | Oxyromecheleus namini |
| Mytus halepensis | – | – |
| Clarias gariepinus | Clarias gariepinus | Clarias gariepinus |
| – | – | Gambusia holbrooki |
| – | – | Paraphanius monte |
| Apianius monto | Apianius monto | Paraphanius orontis |
| Liza abu | Liza abu | Planiliza abu |
| Tilapia zili, Oreochromis niloticus | Tilapia zili | Coptodon zili |
| – | – | Sarotherodon galilaeus |
| – | – | Tristramella simonis |

| Seyhan River | Bostancı 2006 | Ergül and Özdemir 2011 | Ergüden Alagöz and Göksu 2012 | This Study |
|--------------|--------------|-----------------|------------------|------------|
| Capoeta damascina | Capoeta damascina | Capoeta damascina | Capoeta damascina |
| – | – | Capoeta erhani |
| – | Carassius carassius |
| – | – | Carassius gibelio |
| – | – | Cyprinus carpio |
| – | – | Cyprinus carpio |
| Garra rufa | Garra rufa | Garra rufa | Garra turcica |
| – | – | Cebitis levantina |
| Barbus pectoralis | Barbus pectoralis, Barbus rajanorum | Luciobarbus pectoralis | Luciobarbus pectoralis |
| – | Tinca tinca | Tinca tinca |
| – | – | Acanthobrama marmid |
| – | Acanthobrama sp., Acanthobrama orontis |
| Albunomus orontis | Albunomus orontis | Albunomus sp. |
| Albunomus adanensis | Albunomus adanensis | Albunomus kotschyi |
| Chondrostoma region | Chondrostoma region | Chondrostoma ceyhanensis |
| – | – | Squalius adanensis |
| – | – | Squalius koffeltal |
| – | – | Squalius koffeltal |
| – | – | Squalius seyhanensis |
| – | – | Pseudophoxinus zekaiy |
| – | – | Pseudophoxinus zekaiy |
| – | – | Pseudophoxinus zekaiy |
| – | – | Pseudophoxinus zekaiy |
| – | – | Oxyromecheleus samancicus |
| – | – | Oxyromecheleus samancicus |
| – | – | Oxyromecheleus samancicus |
| – | – | Oxyromecheleus samancicus |
| Paracobitis tigris | – | – | Oxyromecheleus samancicus |
| Paracobitis seyhanensis | Paracobitis seyhanensis | – |
| – | – | Oxyromecheleus samancicus |
| – | – | Oxyromecheleus samancicus |
| – | – | Oxyromecheleus samancicus |
| – | – | Oxyromecheleus samancicus |
| – | – | Oxyromecheleus samancicus |
| Squalius lepidus | Squalius lepidus | Squalius koffeltal |
| Squalius seyhanensis | Squalius seyhanensis |
| Squalius seyhanensis |
| Squalius seyhanensis |
| Squalius seyhanensis |
| – | – | Esoc lucas |
| Salmo trutta macrostigma | Salmo trutta macrostigma | – |
| Salmo trutta macrostigma | – | Salmo labecula |
| Salmo trutta macrostigma | Salmo trutta macrostigma | Salmo labecula |
| – | – | Atherina boyeri |
| – | – | Atherina boyeri |
| – | – | Paraphanius similis |
| – | – | Paraphanius similis |
| Sander lucioperca | Sander lucioperca | – |
| Sander lucioperca | – |
| Sander lucioperca |
| Brienius fluvatilis | Salania fluvatilis | Salania fluvatilis |
| Brienius fluvatilis | Salania fluvatilis | Salania fluvatilis |
The distribution area of the was identified as previous studies to be in the Orontes and Seyhan rivers, to Turkish inland waters. recognised a total of thirty species, eight of them as new who revised the genus has recently been conducted by Freyhof et al. (2018c), represented by only a few species. A comprehensive study diversity in Anatolia for many years, it was thought to be suggested that it might be extinct. Finally, Bektas et al. (2020) have studied molecular characters of the genus Alburnus, and they recently treat as a synonym of A. kotschy.

Although the genus of the Cobitis has had high biodiversity in Anatolia for many years, it was thought to be represented by only a few species. A comprehensive study has recently been conducted by Freyhof et al. (2018c), who revised the genus Cobitis in the Middle East and recognised a total of thirty species, eight of them as new to Turkish inland waters. Cobitis levantina, reported by previous studies to be in the Orontes and Seyhan rivers, was identified as C. anabelae by Freyhof et al. (2018c). The distribution area of the C. levantina is restricted to the lower part of the Orontes in Syria and in the Litani River drainage in Lebanon (Krupp and Moubayed 1992).

Oxynoemacheilus argyrogramma is distributed in the Euphrates and Tigris River basins. P. abu is recorded for the first time in the Ceyhan River. Also, Esox lucius is widespread in rivers of the Anatolia. It is first recorded from the Seyhan River.

The Lake Gölbasi is located in a national park in Adiyaman province (eastern Anatolia). It is connected to two lakes, named Azaplı and İnekli. These lakes are connected to the Ceyhan River. They have been separated in the past and their connections might be relatively new (Freyhof et al. 2018c; Saç et al. 2019). Today, the water transfer to the Ceyhan Basin is provided by the Çataltepe-Kartalkaya Line (GAP – Gaziantepl Emergen-

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References

Alagöz Ergüden S, Göksu MZL (2012) The fish Fauna of the Seyhan Dam Lake (Adana) Journal of Fisheries Sciences 6: 39–52. https://doi.org/10.3153/jfscom.2012006

Bariche M, Freyhof J (2016) Status of *Pseudophoxinus libani* and *P. kervišli*, two minnows from the Levant (Teleostei: Cyprinidae). Ichthyological Exploration of Freshwaters 27(3): 203–210.

Bayçelebi E, Kaya C, Turan D, Ergüden SA, Freyhof J (2018) Redescription of *Garra turricca* from southern Anatolia (Teleostei: Cyprinidae). Zootaxa 4524: 227–236. https://doi.org/10.11646/zootaxa.4524.2.6

Bektas Y, Turan D, Aksu I, Ciftci Y, Ergul O, Kalayci G, Belduz AO (2017) Molecular phylogeny of the genus *Capoeta* (Teleostei: Cyprinidae) in Anatolia, Turkey. Biochemical Systematics and Ecology 70: 80–94. https://doi.org/10.1016/j.bse.2016.11.005

Bektas Y, Aksu I, Kaya C, Turan D (2020) Molecular systematics and phylogeography of the genus *Alburnus* Rafinesque, 1820 (Teleostei, Leuciscidae) in Turkey. Mitochondrial DNA Part A: 1–12. https://doi.org/10.1080/24701394.2020.1791840

Birecikligil SS, Yücel ŞY, Çiçek E (2016) A taxonomic evaluation of *Alburnus sellal* Heckel, 1843 and *Alburnus adanensis* Battalgazi, 1944 based on morphological characters and mitochondrial DNA sequences. Pakistan Journal of Zoology, 48 (2): 465–473.

Bogutskaya NG (1997) Contribution to the knowledge of leuciscine fishes of Asia Minor. Part 2. An annotated checklist of leuciscine fishes (Leuciscinae, Cyprinidae) of Turkey with descriptions of a new species and two new subspecies. Mitteilungen aus dem Hamburger Zoologischen Museum und Institut 94: 161–186.

Borkenhagen K, Freyhof J (2009) New records of the Levantine endemic cichlid. *Tristramella simonis* from Syria. Cybium 33(4): 335–336.

Bostancı Z (2006) Seyhan, Ceyhan ve Ası nehirlerinde yasayan balıkların sistematik yönden incelenmesi [Taksonomic [sic] investigation of freshwater fish fauna living in the Seyhan, Ceyhan and Ası River in Turkey]. PhD Thesis, Karadeniz Teknik Üniversitesi Fen Bilimleri Enstitüsü, Trabzon.

Dağlı M (2008) Kınacık Deresi ve Afrı Çayı’nın Balık Faunası (Kilis, Türkiye). Journal of Fisheries Sciences 2(4): 632–638.

Erk’a an F, Özdemir F (2011) Revision of the fish fauna of the Seyhan and Ceyhan River Basins in Turkey. Research Journal of Biological Sciences 6: 1–8. https://doi.org/10.3923/rjbsci.2011.1.8

Figure 10. Views from the Seyhan, Ceyhan and Orontes River drainages, representative of habitat. a. Stream Eğlence (Seyhan); b. Stream Üçürge (Seyhan); c. Stream Aksu-III (Ceyhan); d. Spring Çöçelli (Ceyhan); e. Stream Karasu-I (Orontes); f. Lake Balık (Orontes).
Freyhof J, Özuluğ M (2014) *Acanthohrama thibetae*, a new species of bream from southern Anatolia, Turkey (Teleostei: Cyprinidae). Ichthyological Exploration of Freshwaters 25(1): 1–10.

Freyhof J, Özuluğ M, Kaya C, Bayçelebi E, Turan D (2018a) Redescription of *Alburnus kostchi* Steindachner, 1863 with comments on *Alburnus sellal adanensis* Battalgazi, 1944 (Teleostei: Leuciscidae). Zootaxa 4382(3): 573–582. https://doi.org/10.11646/zootaxa.4382.3.8

Freyhof J, Kaya C, Bayçelebi E, Geiger M, Turan D (2018b) Generic assignment of *Leuciscus kuroi* Bogutskaya from the upper Tigris drainage, and a replacement name for *Alburnus kuroi* Mangit & Yerli (Teleostei: Leuciscidae). Zootaxa 4410(1): 113–135. https://doi.org/10.11646/zootaxa.4410.1.6

Freyhof J, Bayçelebi E, Geiger MF (2018c) Review of the genus *Cobitis* in the Middle East, with the description of eight new species (Teleostei: Cobitidae). Zootaxa 4535(1): 1–75. https://doi.org/10.11646/zootaxa.4535.1.1

Freyhof J, Kaya C, Turan D, Geiger MF (2019) Review of the *Oxyneumachilus tigris* group with the description of two new species from the Euphrates drainage (Teleostei: Nemacheilidae). Zootaxa 4612(1): 29–57. https://doi.org/10.11646/zootaxa.4612.1.2

Freyhof J, Turan D (2019) *Alburnus magnificus*, a new species of bleak from the Orontes River drainage (Teleostei: Leuciscidae). Zootaxa 4595(2): 373–383. https://doi.org/10.11646/zootaxa.4595.2.10

Fricke R, Eschmeyer WN, Van der Laan R (2020) Eschmeyer’s Catalog of Fishes: genera, species, references. http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp [January 2020]

Froese R, Pauly D (2020) FishBase. World Wide Web electronic publication. www.fishbase.org [version (02/2020)]

Geiger MF, Herder F, Monaghan MT, Almada V, Barbieri R, Bariche M, Berrebi P, Bohlen J, Casal-Lopez M, Delmastro GB, Denys GPJ, Dettai A, Doadrio I, Kalogianni E, Kärst H, Kottelat M, Kovačić M, Laporte M, Lorenzoni M, Marčić Z, Özuluğ M, Perdices A, Perea S, Persat H, Porcelotti S, Puzzi C, Robalo J, Šanda R, Schneider M, Šlechtová V, Stoumboudi M, Walter S, Freyhof J (2014) Spatial heterogeneity in the Mediterranean Biodiversity Hotspot affects barcoding accuracy of its freshwater fishes. Molecular Ecology Resources 14: 1210–1221. https://doi.org/10.1111/1755-0998.12257

Goren M, Fishelson L, Trewavas E (1973) The cyprinid fishes of the Mediterranean drainage, and a replacement name for *Alburnus kuroi* Mangit & Yerli (Teleostei: Leuciscidae). Zootaxa 4410(1): 113–135. https://doi.org/10.11646/zootaxa.4410.1.6

Goren M, Fishelson L, Trewavas E (1973) The cyprinid fishes of the Mediterranean drainage, and a replacement name for *Alburnus kuroi* Mangit & Yerli (Teleostei: Leuciscidae). Zootaxa 4410(1): 113–135. https://doi.org/10.11646/zootaxa.4410.1.6

Kaya C, Turan D, Unlu E (2016) The Latest Status and Distribution of Fishes in Upper Tigris River and Two New Records for Turkish Freshwaters. Turkish Journal of Fisheries and Aquatic Sciences 16: 545–562. https://doi.org/10.4194/1303-2712-v16_3_07

Kaya C (2019) Taxonomic revision of the species belong to genus *Capoeta* distributed in Turkey. PhD Thesis. Recep Tayyip Erdogan University, Institute of Science and Technology, Rize, Turkey, 126 pp.

Kaya C, Turan D, Bayçelebi E, Karacay G, Freyhof J (2020) *Oxyneumachilus ciclicos*, a new nemacheilid loach from the Göksu River in southern Anatolia (Teleostei: Nemacheilidae). Zootaxa 4808(2): 284–300. https://doi.org/10.11646/zootaxa.4808.2.3

Krupp F (1985) Systematik und Zoogeographie der Süßwasserfische des levantinischen Grabenbruch-systems und der Ostküste des Mittelmeers. Dissertation, Johannes Gutenberg Universität, Mainz 215 pp.

Krupp F (1992) Two new species of cyprinid fishes from the Mediterranean coastal drainage basin of Syria (Pisces: Osteichthyes: Cyprinidae). Senckenbergiana Biologica 72(1/3): 19–25.

Küçük F, Turan D, Güçlü SS, Mutlu AG, Çiftci Y (2017) Two new species of *Chondrostoma Agassiz, 1832* (Teleostei: Cyprinidae) from Ceyhan, Seyhan and Göksu Rivers in the East Mediterranean region of Turkey. Turkish Journal of Fisheries and Aquatic Sciences 17: 795–803. https://doi.org/10.4194/1303-2712-v17_4_15

Levin BA, Freyhof J, Lajžner Z, Perea S, Abdoli A, Gaffaroğlu M, Özuluğ M, Rubenyan HR, Salnikov VB, Doadrio I (2012) Phylogenetic relationships of the algae scraping cyprinid genus *Capoeta* (Teleostei: Cyprinidae). Molecular Phylogenetics and Evolution 62: 542–549. https://doi.org/10.1016/j.ympev.2011.09.004

Özdemir F (2013) Türkiye’deki *Capoeta* (Teleostei: Cyprinidae) Cin sine Ait Tür ve Alttürlerinin Klasik ve Moleküler Sistematik Yöntemler Kullanılarak Revizyonu. Doktora Tezi. Hacettepe Üniversitesi Fen Bilimleri Enstitüsü Ankara Türkiye, 157 pp.

Özuluğ M, Freyhof J (2008) *Capoeta turani*, a new species of barbel from River Seyhan, Turkey (Teleostei: Cyprinidae). Ichthyological Exploration of Freshwaters 19: 289–296.

Saç G, Özuluğ M, Elp M, Gaffaroğlu M, Ünal S, Ayata MK, Kaya C, Freyhof J (2019) New records of *Pseudophoxinus frati* from Turkey (Teleostei: Leuciscidae). Journal of Applied Ichthyology 35(3): 769–774. https://doi.org/10.1111/jai.13869

Turan D, Kottelat M, Engin S (2012) The troutts of the Mediterranean drainages of southern Anatolia, Turkey, with description of three new species (Teleostei: Salmonidae). Ichthyological Exploration of Freshwaters 23(3): 219–236. https://doi.org/10.11646/zootaxa.4808.2.3

Turan D, Kottelat M, Bayçelebi E (2017) *Squalius semae*, a new species of chub from the Euphrates River, Eastern Anatolia (Teleostei: Cyprinidae). Zoology in the Middle East 63(1): 33–42. https://doi.org/10.1080/09379140.2017.1290761

Sungar S (2020) *Oxyneumachilus kossowski* a junior synonym of *O. seyhanensis* (Teleostei: Nemacheilidae). Iranian Journal of Science and Technology Transactions A: Science 44: 563–573. https://doi.org/10.1007/s40995-020-00857-9 [First published online]

Ilınlı D (2020) Fish Diversity and Abundance in the Seyhan River Estuary, Mediterranean Sea Basin, Turkey. Acta Zoologica Bulgarica 173–180.

Kara C, Alp A, Şimşekli M (2010) Distribution of Fish Fauna on the Upper and Middle Basin of Ceyhan River, Turkey. Turkish Journal of Fisheries and Aquatic Sciences 10: 111–122. https://doi.org/10.4194/trfjas.2010.0116