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Freshwater lamprey and fishes of Iran; a revised and updated annotated checklist-2022

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Abstract: The current status of the inland waters ichthyofauna of Iran is revised and updated. A total of 292 fish species belong to 3 classes, 24 orders, 36 families and 106 genera inhabit the inland waters of Iran. Among these, 29 species (9.9%) are exotic and 102 species (35%) are endemic. Orders with the largest numbers of species in the ichthyofauna of Iran are the Cypriniformes (182 species) followed by Gobiiformes (30 species), Cyprinodontiformes (15 species), Siluriformes (12 species), Clupeiformes (10 species), Acipenseriformes and Cichliformes (7 species) and Mugiliformes (6 species). At the family level, the Cyprinidae has the greatest number of species (74 species; 25.34% of the total species), followed by the Nemacheilidae (47 species), Leuciscidae (42 species), Gobiidae (30 species), Aphaniidae (11 species), Clupeidae (10 species), Acipenseridae and Cichlidae and Sisoridae (7 species in each) and Cobitidae and Mugilidae (6 species).

Key words: Freshwater ichthyofauna, Iran, endemism, introduced

1. Introduction

Iran possesses a rich freshwater fish fauna in terms of diversity and endemism, and its ichthyofauna is characterized by having elements from Palearctic, Oriental, and Ethiopian ecoregions with exotics from the Nearctic and Neotropical origins (Esmaeili et al., 2010a, b, 2013a, b, 2014a, b, 2017a, 2018). The remarkable Iranian ichthyofauna has attracted the interest of foreign naturalists and scientists for a long time and later awareness regarding Iranian fish taxonomy increased among Iranian researchers at the end of the 20th century. During the last two decades, scientists significantly increased their knowledge of Iranian freshwater fish diversity (Esmaeili et al., 2018).

The first checklist of Iranian freshwater fishes was published by Coad (1995) listing 150 species in 25 families, 14 orders, and 3 classes found in the 19 drainage basins. Later Coad (1998) listed 155 species in 67 genera, 24 families, 15 orders, and 3 classes. Subsequently, Esmaeili et al. (2010a) provided a list of the freshwater fishes of Iran and confirmed the presence of 202 species in 104 genera, 28 families, 17 orders, and 3 classes. They also reported 23 species whose presence in Iranian waters needed confirmation by specimens. Later, Jouladeh-Roudbar et al. (2015a) listed 257 species in 106 genera, 29 families, 18 orders, and 3 classes. According to them, the most diverse order is the Cypriniformes with 162 species or 63.04% of the fauna, followed by Perciformes (32 species, 12.45%), Cyprinodontiformes (17 species, 6.61%) and Clupeiformes (11 species, 4.28%). Keivany et al. (2016) reported a total of 163 species occurring in the freshwater of Iran, excluding the Caspian Sea, mostly based on their own collections. In another publication, Esmaeili et al. (2017a) listed 288 species in 107 genera, 28 families, 22 orders, and 3 classes reported from different Iranian basins. However, according to them, the presence of 23 species in Iranian waters needs confirmation by specimens. Esmaeili et al. (2018) provided a new list of inland/freshwater fishes of Iran reporting 297 species in 109 genera, 30 families, 24 orders, and 3 classes (including 23 unconfirmed species). In the last published checklist, Jouladeh-Roudbar et al. (2020), a list of 274 recognized species in 100 genera, 33 families, 20 orders, and 3 classes was given.

Although there are quite a number of publications on freshwater fish taxonomy, the data set for freshwater fish assemblages are still poor. In this paper, we present an updated checklist of the freshwater fishes of Iran based on previous checklists (Esmaeili et al., 2018), and new species

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records. Nonetheless, the continuing description of new species of Iran 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 to represent the currently known diversity of the freshwater fishes of Iran, including only confirmed species.

2. 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 from recent publications dealing with species present in the inland waters of Iran and/or describing new species of fishes from Iran. The previously published checklists are taken as a baseline (Esmaeili et al., 2018). In addition, information on fish distribution in FishBase was evaluated. Additional fish records published during the last decade were added, and some questionable species appearing in previous checklists were evaluated and either verified or excluded from the present list. We follow the family classification of Nelson et al. (2016), with orders and families arranged systematically, but genera and species alphabetically within each family.

In the present checklist, we include only those fishes which spend some parts of their life or their entire life history in freshwater systems. Some species are excluded from the checklist because (1) they were erroneously identified, (2) taxa were synonymized, and (3) they were probably not occurring in inland waters of Iran and need confirmation by the specimen. Such questionable species are excluded from the list unless their occurrence can be proven.

3. Results

The present checklist includes 292 species inhabiting freshwater systems of Iran, belonging to 3 classes, 24 orders, 36 families, and 106 genera. Among them, 102 species (35%) are considered as endemic and 29 species (9.9%) are exotic (Figure 1). The dominant order in the fish fauna is Cypriniformes (182 species) followed by Gobiiformes (30 species), Cyprinodontiformes (15 species), Siluriformes (12 species), Clupeiformes (10 species), Acipenseriformes and Cichliformes (7 species in each) and Mugiliformes (6 species) (Figure 2). At the family level, the Cyprinidae has the greatest number of species (74 species; 25.34% of the total species), followed by the Nemacheilidae (47 species; 16.1% of the total species), Leuciscidae (42 species; 14.38% of the total species), Gobiidae (30 species; 10.27% of the total species), Aphaniidae (11 species; 3.77% of the total species), Clupeidae (10 species; 3.42% of the total species), Acipenseridae, Cichlidae and Sisoridae (7 species; 2.4% of the total species in each) and Cobitidae and Mugilidae

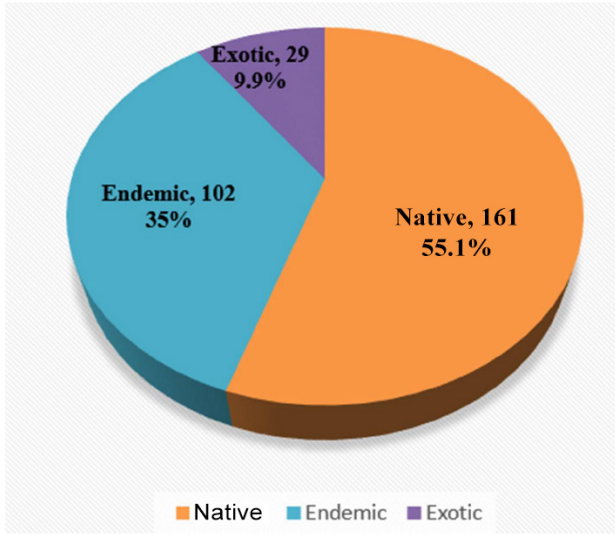

Figure 1. Percentage of the total occurrence of endemic, exotic, and native fishes of Iranian inland waters.

(6 species; 2.05% of the total species in each) (Figure 3). The highest number of endemic (36 species) belong to the Tigris basin and exotic (17 species) to Tigris and Caspian Sea basins, and the Caspian Sea basin has the highest number of native species (83 species) (Tables 1, 2, and Figure 4).

Species name **(Author)** [Occurrence]-[IUCN], English Name/ Distribution (Reference/s).

Kingdom Animalia
Phylum Chordata
Subphylum Craniata
Infraphylum Vertebrata
Superclass Petromyzontomorphi
Class Petromyzontida
Order Petromyzontiformes
Family Petromyzontidae
Genus *Caspiomyzon* Berg, 1906

1. ***Caspiomyzon wagneri*** (Kessler, 1870) [N]-[NT], Caspian lampreys/Caspian Sea Basin (Eagderi et al., 2017d; Namdarian Rad et al., 2017).

Class Chondrichthyes
Order Carcharhiniformes
Family Carcharhinidae
Genus *Carcharhinus* Blainville, 1816

2. ***Carcharhinus leucas*** (Valenciennes 1839) [N]-[NT], Bull shark/Tigris, Persian Gulf Basin (Esmaeili et al., 2018).

Superclass Gnathostomata
Grade Teleostomi
Class Osteichthyes
Subclass Actinopterygıı
Infraclass Chondrostei

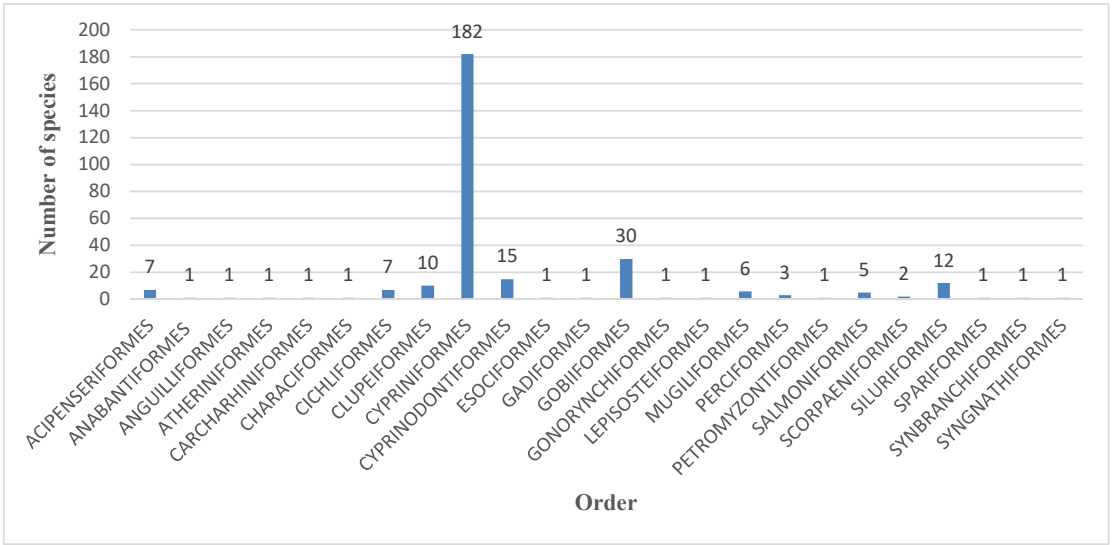

Figure 2. Number of fish species in different orders.

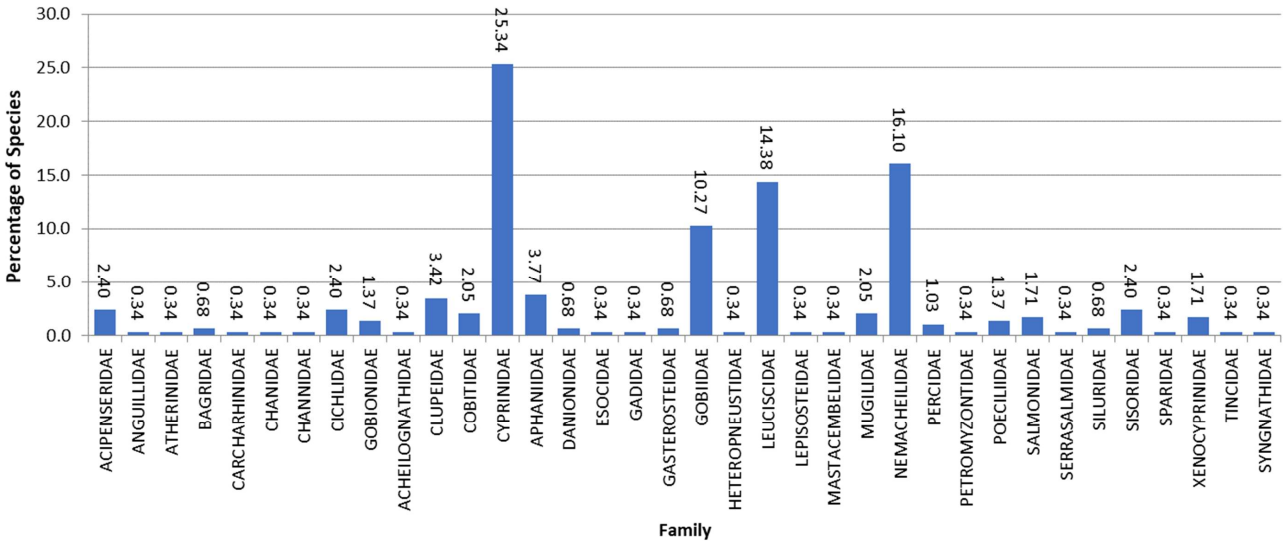

Figure 3. Percentage of fish species in different families.

Order Acipenseriformes

Family Acipenseridae

Genus *Acipenser* Linnaeus, 1758

3. ***Acipenser baerii*** Brandt, 1869 [I]-[EN], Siberian Sturgeon/Caspian Sea Basin (Hasanalipour et al., 2013). This species was imported for aquaculture purposes, but it can be found in some natural habitats e.g., Aras River, which probably escaped from fish farms.

4. ***Acipenser gueldenstaedtii*** Brandt & Ratzeburg, 1833 [N]-[CR], Russian sturgeon/Caspian Sea Basin (Esmaeili et al. 2018).

5. ***Acipenser nudiventris*** Lovetsky, 1828 [N]-[CR], Fringebarbel sturgeon/Caspian Sea Basin (Esmaeili et al., 2018).

6. ***Acipenser persicus*** Borodin, 1897 [N]-[CR], Persian sturgeon/Caspian Sea Basin (Eagderi et al., 2017a; Esmaeili et al., 2018).

7. ***Acipenser ruthenus*** Linnaeus, 1758 [N]-[VU], Sterlet/Caspian Sea Basin. Comment: Reported from the middle and South Caspian Sea by Naseka and Bogutskaya (2009) but not confirmed by specimens for Iran. This species is transported to the Shahid Rajaee Fish Aquaculture Center at Sari, Mazandaran, and some other fish farms in Guilan and Golestan provinces for aquaculture purposes.

8. ***Acipenser stellatus*** Pallas, 1771 [N]-[CR], Stellate sturgeon/Caspian Sea Basin (Esmaeili et al., 2018).

Table 1. Occurrence percentage of endemic, exotic and native fish species separately for each basin.

Basins	Total	Native		Endemic		Exotic	
		#	%	#	%	#	%
1: Caspian Sea	110	83	75.5	10	9.1	17	15.5
2: Dasht-e Kavir	18	4	21.1	6	33.33	8	44.4
3: Dasht-e Lut	9	5	55.6	1	11.1	3	33.3
4: Esfahan	14	2	14.3	6	42.9	6	42.9
5: Mashkid	18	11	61.1	2	11.1	5	27.8
6: Jaz Murian	14	6	42.9	2	14.3	6	42.9
7: Kor River	22	4	18.2	11	50.0	7	31.8
8: Lake Maharlu	14	3	21.4	4	28.6	7	50.0
9: Lake Urmia	26	11	42.3	7	26.9	8	30.8
10: Namak Lake	23	3	12.5	9	39.1	11	47.8
11: Sirjan	5	1	20.0	1	20.0	3	60.0
12: Sistan	21	11	52.4	3	14.3	7	33.3
13: Hari River	23	14	60.9	0	0	9	39.1
14: Kerman-Nain	6	1	16.7	2	33.3	3	50.0
15: Makran	24	16	66.7	3	12.5	5	20.8
16: Hormuz	35	16	45.7	15	42.9	4	11.4
17: Persis	41	19	45.2	14	34.1	8	19.5
18: Tigris River	107	55	50.9	36	33.6	17	15.9
19: Zohreh River	11	5	45.5	3	27.3	3	27.3
TOTAL	**292**	**161**	**55.1**	**102**	**35**	**29**	**9.9**

Genus *Huso* Brandt & Ratzeburg, 1833

9. ***Huso huso*** (Linnaeus, 1758) [N]-[CR], Beluga/Caspian Sea Basin (Asgari et al., 2014; Esmaeili et al., 2018).

Infraclass Holostei

Division Ginglymodi

Order Lepisosteiformes

Family Lepisosteidae

Genus *Atractosteus* Rafinesque, 1820

10. ***Atractosteus spatula*** (Lacepède, 1803) [I]-[NE], Alligator gar/Tigris, Persian Gulf basin (Esmaeili et al. 2017b, 2018).

Remark: It has been reported from the southern reaches of the Arvand River/Shatt al-Arab River at Om-al-Rasas Island, Basrah, Iraq during an ichthyologic survey in September 2016 (Mutlak et al., 2017) and from Marivan (Zarivar) Lake, a Tigris River tributary of Iran (Esmaeili et al., 2017b). The aquarium trade pathway is the suspected factor for the presence of this species in the freshwater area of Iran and Iraq. Monitoring of inland waters is recommended.

Neopterygii

Infraclass Holostei

Division Teleosteomorpha

Subdivision Teleostei

Supercohort Teleocephala

Cohort Elopomorpha

Order Anguilliformes

Family Anguillidae

Genus *Anguilla* Schrank, 1798

11. ***Anguilla anguilla*** (Linnaeus, 1758) [I]-[CR], European eel/Introduced to the Caspian Sea basin (Esmaeili et al., 2018).

Clupeocephala

Cohort Otocephala

Superorder Clupeomorpha

Order Clupeiformes

Family Clupeidae

Kottelat and Freyhof (2007) listed *Alosa volgensis* (Berg, 1913) from Iranian waters but we cannot confirm the presence of this species in Iran. The distribution range of this species is limited to the northern Caspian Sea. *Alosa curensis* (Suvorov, 1907) is poorly known and described from Kyzylagach Bay of Azerbaijan. We could not confirm the presence of this species in Iran.

Table 2. List of species to be excluded and their exclusion criterion (EQ) from the freshwater checklist of Iran (species are listed in alphabetical order).

Species	EQ	Explanation
Alburnoides coadi Mousavi-Sabet, Vatandoust & Doadrio, 2015	2	Junior synonym of *Alburnoides namak* (Jouladeh-Roudbar and Eagderi 2017).
Alburnoides idignensis Bogutskaya & Coad, 2009	2	Junior synonym of *Alburnoides nicolausi* (Jouladeh-Roudbar and Eagderi 2019).
Alburnoides parhami Mousavi-Sabet, Vatandoust & Doadrio, 2015	2	Junior synonym of *Alburnoides holciki* (Jouladeh-Roudbar and Eagderi 2019).
Alburnus zagrosensis (Coad, 2009)	2	Junior synonym of *Alburnus sellal* (Eagderi et al., 2019b).
Alosa curensis (Suvorov, 1907)	3	Need confirmation by specimen.
Alosa volgensis (Berg, 1913)	3	Need confirmation by specimen.
Aphanius arakensis Teimori, Esmaeili, Gholami, Zarei & Reichenbacher, 2012	3	Junior synonym of *Esmaeilius sophiae* (Heckel, 1849) (Freyhof and Yoğurtçuoğlu 2020).
Aphanius farsicus Teimori, Esmaeili & Reichenbacher, 2011	3	Junior synonym of *Esmaeilius persicus (*Jenkins 1910) (Freyhof and Yoğurtçuoğlu 2020).
Aphanius arakensis Teimori, Esmaeili, Gholami, Zarei & Reichenbacher, 2012	3	Junior synonym of *Esmaeilius sophiae* (Heckel, 1849) (Freyhof and Yoğurtçuoğlu 2020).
Aphanius kavirensis Esmaeili, Teimori, Gholami & Reichenbacher, 2014	3	Junior synonym of *Esmaeilius sophiae* (Heckel, 1849) (Freyhof and Yoğurtçuoğlu 2020).
Aphanius pluristriatus (Jenkins, 1910)	3	Junior synonym of *Esmaeilius sophiae* (Heckel, 1849) (Freyhof and Yoğurtçuoğlu 2020).
Babka gymnotrachelus (Kessler, 1857)	3	Need confirmation by specimen.
Babka macrophthalma (Kessler, 1877)	3	Need confirmation by specimen.
Benthophiloides brauneri Beling and Iljin, 1927	3	Need confirmation by specimen.
Benthophiloides turcomanus (Iljin, 1941)	3	Need confirmation by specimen.
Benthophilus casachicus Ragimov, 1978	3	Need confirmation by specimen.
Benthophilus grimmi Kessler, 1877	3	Need confirmation by specimen.
Benthophilus kessleri Berg, 1927	3	Need confirmation by specimen.
Benthophilus leptocephalus Kessler, 1877	3	Need confirmation by specimen.
Benthophilus leptorhynchus Kessler, 1877	3	Need confirmation by specimen.
Benthophilus mahmudbejovi Ragimov, 1976	3	Need confirmation by specimen.
Benthophilus ragimovi Boldyrev & Bogutskaya, 2004	3	Need confirmation by specimen.
Benthophilus spinosus Kessler, 1877	3	Need confirmation by the specimen.
Benthophilus svetovidovi Pinchuk & Ragimov, 1979	3	Need confirmation by the specimen.
Capoeta kaput Levin, Prokofiev & Roubenyan, 2019	3	Need confirmation by the specimen (Kuljanishvili et al., 2020).
Capoeta sevangi De Filippi, 1865	2	Junior synonym of *C. capoeta* (Kuljanishvili et al., 2019).
Garra variabilis	3	Need confirmation by the specimen.
Hyrcanogobius bergi Iljin, 1928	3	Need confirmation by the specimen.
Mesogobius nigronotatus (Kessler, 1877)	3	Need confirmation by the specimen.
Oncorhynchus keta (Walbaum, 1792)	3	Need confirmation by the specimen.
Oxynoemacheilus arygyrogramma (Heckel, 1877)	1	Misidentified.
Oxynoemacheilus freyhofi Jouladeh-Roudbar, Eagderi & Hosseinpour, 2016	2	Junior synonym of *Oxynoemacheilus euphraticus* (Bănărescu & Nalbant 1964) (Freyhof 2016b)
Oxynoemacheilus hanae Freyhof & Abdullah, 2017	3	Need confirmation by specimen.
Oxynoemacheilus lenkoranensis (Abdurakhamanov, 1962)	2	Junior synonym of *O. bergianus* (Freyhof et al., 2022).
Oxynoemacheilus veyselorum Çiçek, Eagderi & Sungur, 2018	3	Need confirmation by specimen.
Paracobitis longicauda (Kessler, 1872)	**3**	Need confirmation by specimen.
Paraschistura pasatigris (Coad & Nalbant, 2005)	2	Junior synonym of *Paraschistura ilamensis* Vatandoust & Eagderi 2015 (Eagderi et al., 2019d).
Paracobitis vignai Nalbant & Bianco, 1998	2	Synonym of *Paracobitis rhadinaea* (Regan, 1906) (Sayyadzadeh et al., 2019a).
Pimephales promelas Rafinesque, 1820	3	Need confirmation by specimen.
Ponticola platyrostris (Pallas, 1814)	3	Need confirmation by specimen.
Rutilus rutilus (Linnaeus, 1758)	3	Need confirmation by specimen (Kuljanishvili et al., 2020).
Salvelinus fontinalis (Mitchill, 1814)	3	Need confirmation by specimen.
Sander volgensis (Gmelin, 1789)	3	Need confirmation by specimen.

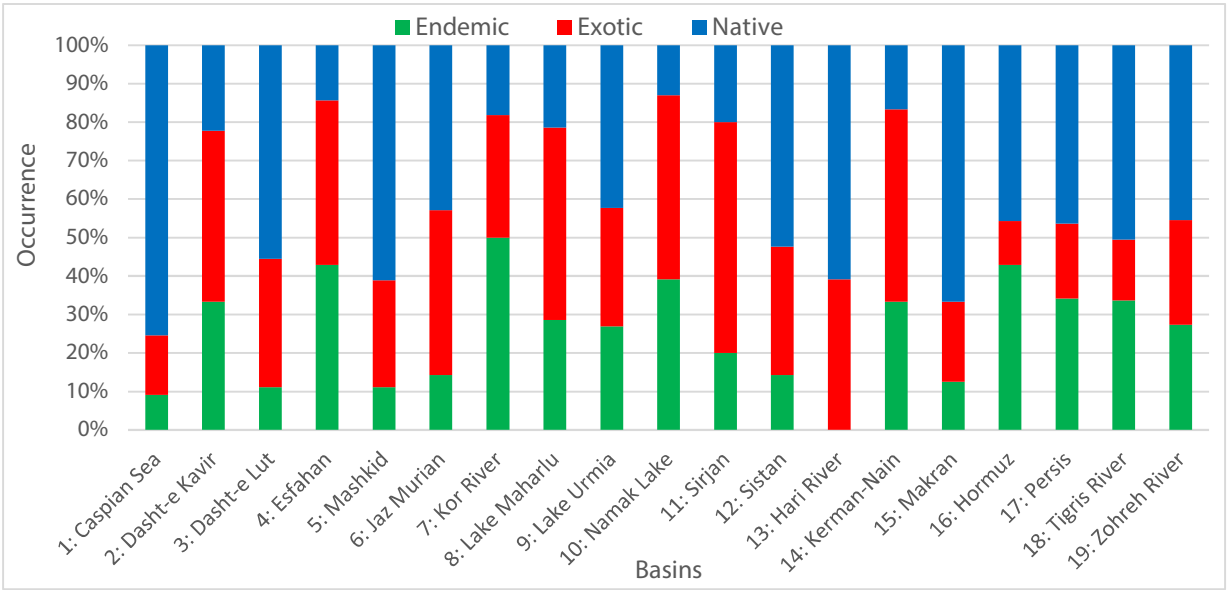

Figure 4. Occurrence percentage of endemic, exotic, and native fish species separately for each basin.

Genus *Alosa* Linck, 1790

12. ***Alosa braschnikowi*** (Borodin, 1904) [N]-[NE], Caspian marine shad-Brazhnikov's shad/ Caspian Sea Basin (Esmaeili et al., 2018; Saffari et al., 2021).

13. ***Alosa caspia*** (Eichwald, 1838) [N]-[LC], Caspian shad/Caspian Sea Basin (Esmaeili et al., 2018).

14. ***Alosa kessleri*** (Grimm, 1887) [N]-[LC], Caspian anadromous shad-blackback-black-spined herring/ Caspian Sea Basin (Esmaeili et al., 2018).

15. ***Alosa saposchnikowii*** (Grimm, 1885) [N]-[NE], Saposhnikovi shad/Caspian Sea Basin (Esmaeili et al., 2018).

16. ***Alosa sphaerocephala*** (Berg, 1913) [N]-[LC], Agrakhan shad/Caspian Sea Basin (Esmaeili et al., 2018).

Genus *Clupeonella* Kessler, 1877

17. ***Clupeonella caspia*** Svetovidov, 1941 [N]-[LC], Caspian tyulka/Caspian Sea Basin (Esmaeili et al., 2018; Amiri et al., 2018).

Remark: *Clupeonella cultriventris* is widespread along the coasts of the Black and Caspian Seas, entering the lower reaches of rivers. Based on unpublished data (see Kuljanishvili et al., 2020) including molecular and morphological studies they failed to distinguish the Caspian population (*C. caspia*) from the Black Sea population (*C. cultriventris*). Hoestlandt (1991) followed by Kottelat and Freyhof (2007) separate these two tyulkas largely based on the length of paired fins, a character that is found to be very much overlapping in the materials examined by Kuljanishvili et al. (2020). Therefore, they treated *C. caspia* as a synonym of *C. cultriventris*. More data using different populations from the southern Caspian and the Black seas is needed to accept this synonymy.

18. ***Clupeonella cultriventris*** (Nordman, 1840) [N]-[LC], Caspian tyulka/Caspian Sea Basin (Amiri et al., 2017a,b; Esmaeili et al., 2018).

19. ***Clupeonella engrauliformis*** (Borodin, 1904) [N]-[NE], Caspian tyulka/Caspian Sea Basin (Esmaeili et al., 2018).

20. ***Clupeonella grimmi*** Kessler, 1877 [N]-[NE], Southern Caspian sprat, Bigeye kilka/Caspian Sea Basin (Esmaeili et al., 2018).

Genus *Tenualosa* Fowler, 1934

21. ***Tenualosa ilisha*** (Hamilton, 1822) [N]-[LC], Hilsa/Tigris and Persis; possibly Hormuz (Esmaeili et al., 2018).

Order Gonorynchiformes

Family Chanidae

Genus *Chanos* Lacepède, 1803

22. ***Chanos chanos*** (Forsskål, 1775) [N]-[LC], Milkfish/Tigris, Persis, Hormuz and Makran (Esmaeili et al. 2018).

Superorder Ostariophysi

Series Otophysi

Subseries Cypriniphysi

Order Cypriniformes

SUBORDER Cyprinoidei

Family Acheilognathidae

Genus *Rhodeus* Agassiz, 1832

23. ***Rhodeus caspius*** Esmaeili, Sayyadzadeh, Japoshvili, Eagderi, Abbasi & Mousavi-Sabet, 2020 [E]-[NE], Caspian bitterling/The Caspian Sea basin, introduced to the Urmia Lake and Tigris basins (Esmaeili et al., 2020a).

Family Cyprinidae

Genus *Arabibarbus* Borkenhagen, 2014

24. ***Arabibarbus grypus*** (Heckel, 1843) [N]-[VU], Shabout/Tigris, Persis and Hormuz (Esmaeili et al., 2018; Soleimanian et al., 2021).

Genus *Bangana* Hamilton, 1822

25. ***Bangana dero*** (Hamilton, 1822) [N]-[LC], Kalabans/Mashkid River basin (Esmaeili et al., 2013a).

Genus *Barbus* Cuvier, 1816

26. ***Barbus cyri*** De Filippi, 1865 [N]-[NE], Kura barbel/Caspian Sea basin (Jalili et al., 2017; Khaefi et al., 2017).

27. ***Barbus karunensis*** Khaefi, Esmaeili, Geiger & Eagderi, 2017 [E]-[NE], Karun barbel/Karun River drainage (Khaefi et al., 2017; Eagderi et al., 2017).

28. ***Barbus lacerta*** Heckel, 1843 [N]-[LC], Tigris barbel/Tigris (Persian Gulf basin) (Khaefi et al., 2017; Esmaeili et al., 2018).

29. ***Barbus miliaris*** De Filippi, 1863 [N]-[NE], Namak barbel/Namak Lake and Kavir basins (Khaefi et al. 2017; Esmaeili et al. 2018).

30. ***Barbus urmianus*** Eagderi, Nikmehr, Çiçek, Esmaeili, Vatandoust & Mousavi-Sabet, 2019 [E]-[NE], Urmia barbel/Urmia Lake basin (Eagderi et al., 2019a).

Genus *Capoeta* Valenciennes, 1842

31. ***Capoeta aculeata*** (Valenciennes, 1844) [N]-[NE], Common large-were scale scraper/Namak Lake and Kavir basins (Zareian et al., 2018).

32. ***Capoeta alborzensis*** Jouladeh-Roudbar, Eagderi, Ghanavi & Doadrio, 2016 [E]-[NE], Alborz large scale scraper /Namak and Kavir basins (Jouladeh-Roudbar et al., 2017a).

33. ***Capoeta birunii*** Zareian & Esmaeili, 2017 [E]-[NE], Esfahan small-scale scraper/Zayandehrud basin (Zareian and Esmaeili, 2017).

34. ***Capoeta buhsei*** Kessler, 1877 [E]-[LC], Namak scraper/Namak Lake basin (Zareian and Esmaeili, 2017; Ahmdzadeh et al., 2019).

35. ***Capoeta capoeta*** (Güldenstädt, 1773) [N]-[LC], Caucasian scraper/Caspian Sea basin (Esmaeili et al., 2017a; Zareian et al., 2018).

36. ***Capoeta coadi*** Alwan, Zareian & Esmaeili, 2016 [E]-[NE], Karun scraper, Coad's scraper/Karun River drainage (Tigris, Persian Gulf basin) (Alwan et al., 2016).

37. ***Capoeta damascina*** (Valenciennes, 1842) [N]-[LC], Mesopotamian barb/Tigris (Persian Gulf basin) (Razavi Pour et al., 2014).

38. ***Capoeta ferdowsii*** Jouladeh-Roudbar, Eagderi, Murillo-Ramos, Ghanavi & Doadrio, 2017 [E]-[NE], Zohreh scraper, Ferdowsi scraper/Zohreh River drainage (Persian Gulf basin) (Jouladeh-Roudbar et al., 2017a).

39. ***Capoeta fusca*** Nikol'skii, 1897 [N]-[NE], Desert scraper/Hari River, Kavir, Bedjestan, Tedzhen River, Sistan and Lut basins (Zareian et al., 2018).

40. ***Capoeta gracilis*** (Keyserling, 1861) [E]-[NE], Esfahan large scale scraper/Zayandehrud (Esfahan) basin (Zareian et al., 2018).

41. ***Capoeta heratensis*** (Keyserling, 1861) [N]-[NE], Hari scraper/Hari-rud River basin (Esmaeili et al., 2018; Zareian et al., 2018).

42. ***Capoeta macrolepis*** (Heckel, 1847) [E]-[NE], Kor scraper/Kor and Tigris (Esmaeili et al., 2018; Zareian et al., 2018).

43. ***Capoeta pyragyi*** Jouladeh-Roudbar, Eagderi, Murillo-Ramos, Ghanavi & Doadrio, 2017 [E]-[NE], Sezar scraper/Tigris River drainage (Persian Gulf basin) (Jouladeh-Roudbar et al., 2017a).

44. ***Capoeta raghazensis*** Eagderi & Mousavi-Sabet, 2021 [E]-[NE], Raghaz scaper/Raghaz Canyon (Hormuz basin) (Eagderi and Mousavi-Sabet, 2021).

45. ***Capoeta razii*** Jouladeh-Roudbar, Eagderi, Ghanavi & Doadrio, 2017 [E]-[NE], Caspian scraper/Caspian Sea and Kavir basins (Jouladeh-Roudbar et al., 2017b).

46. ***Capoeta saadii*** (Heckel, 1847) [E]-[NE], Saadi scraper/Kor, Persis, Hormuz, Kerman and Maharlu Lake (Zareian and Esmaeili, 2017).

47. ***Capoeta shajariani*** Jouladeh-Roudbar, Eagderi, Murillo-Ramos, Ghanavi & Doadrio, 2017 [E]-[NE], Shajarian scraper/Tigris River (Persian Gulf basin) (Jouladeh-Roudbar et al., 2017a).

48. ***Capoeta umbla*** (Heckel, 1843) [N]-[LC], Tigris scraper/Tigris (Persian Gulf basin) (Esmaeili et al., 2016b).

Genus *Carasobarbus* Karaman, 1971

49. ***Carasobarbus kosswigi*** (Ladiges, 1960) [N]-[VU], Kiss-lip himri/Tigris (Persian Gulf basin) (Esmaeili et al., 2017a, 2018).

50. ***Carasobarbus luteus*** (Heckel, 1843) [N]-[LC], Mesopotamian himri/Tigris, Persis, Hormuz, Kor and Maharlu lake (Esmaeili et al., 2017a, 2018).

51. ***Carasobarbus sublimus*** (Coad & Najafpour, 1997) [N]-[NE], Persian himri/Tigris and Zohreh (Persian Gulf basin) (Esmaeili et al., 2017a, 2018).

Genus *Carassius* Jarocki, 1822

52. ***Carassius auratus*** (Linnaeus, 1758) [I]-[LC], Gold fish/widespread in many parts of Iran (Esmaeili et al., 2017a, 2018).

53. ***Carassius gibelio*** (Bloch, 1782) [I]-[NE], Gibel carp/widespread in many parts of Iran (Esmaeili et al., 2017a, 2018; Eagderi et al., 2020a).

54. ***Carassius langsdorfii*** Temminck & Schlegel, 1846 [I]-[NE], Ginbuna/Lar National Park (Caspian Sea Basin) (Khosravi et al., 2022).

Genus *Cyprinion* Heckel, 1843

55. ***Cyprinion kais*** Heckel, 1843 [N]-[LC], Smallmouth lotak/Tigris (Persian Gulf basin) (Esmaeili et al., 2017a, 2018).

56. ***Cyprinion macrostomum*** Heckel, 1843 [N]-[LC], Largemouth lotak/Tigris and probably Persis (Persian Gulf basin) (Nasri et al., 2013; Esmaeili et al., 2017a, 2018).

57. ***Cyprinion microphthalmum*** **(**Day, 1880) [N]-[LC], Smalleye lotak/different rivers and Qanats in southeastern Iran (Nasri et al., 2018).

58. ***Cyprinion milesi*** (Day, 1880) [N]-[NE], Eastern lotak/Makran basin (Sarbaz River) (Nasri et al., 2016).

59. ***Cyprinion tenuiradius*** Heckel, 1847 [E]-[NE], Qarah Aqaj lotak/Persis (Persian Gulf basin) (Esmaeili et al., 2017a, 2018).

60. ***Cyprinion watsoni*** (Day, 1872) [N]-[LC], Indus lotak/might be limited to Pakistan waters. Need further study. (Nasri et al., 2018).

Genus *Cyprinus* Linnaeus, 1758

61. ***Cyprinus carpio*** Linnaeus, 1758 [N]-[VU], Common carp/native populations in the Caspian Sea basin; also introduced there and elsewhere in Iran (Esmaeili et al., 2017a, 2018).

Genus *Garra* Hamilton, 1822

62. ***Garra amirhosseini*** Esmaeili, Sayyadzadeh, Coad & Eagderi, 2016 [E]-[NE], Hot spring garra, Amirhossein's garra/Tigris (Esmaeili et al., 2016c).

63. ***Garra elegans*** (Günther, 1868) [N]-[LC], Elegant garra/-/the lower Little Zab River, the Sirvan River, and the lower Tigris (Freyhof, 2016a).

64. ***Garra gymnothorax*** Berg, 1949 [E]-[NE], Chest scaleless garra/Tigris (Persian Gulf basin) (Esmaeili et al., 2016c).

65. ***Garra hormuzensis*** Zamani-Faradonbe, Zhang & Keivany, 2021 [E]-[NE], Hormuz garra/Kol River drainage (Zamani-Faradonbe et al., 2021a).

66. ***Garra lorestanensis*** Mousavi-Sabet & Eagderi, 2016 [E]-[NE], Blind cave garra/ subterranean waters in the Tigris drainage (Persian Gulf basin) (Mousavi-Sabet and Eagderi, 2016a).

67. ***Garra meymehensis*** Zamani-Faradonbe, Keivany, Dorafshan & Zhang, 2021 [E]-[NE], Meymeh garra/Meymeh River (Tigris basin) (Zamani-Faradonbe et al., 2021b).

68. ***Garra mondica*** Sayyadzadeh, Esmaeili & Freyhof, 2015 [E]-[NE], Mond garra/Mond River drainage, Persis (Persian Gulf basin) (Sayyadzadeh et al., 2015a).

69. ***Garra nudiventris*** (Berg, 1905) [E]-[NE], Lut garra/Kalat-e-Baba Qanat, Lut basin (Esmaeili et al., 2016c).

70. ***Garra persica*** Berg, 1914 [E]-[NE], Persian garra/Hormuz, Makran and Hamun-e Jaz Murian basins (Esmaeili et al., 2016d).

71. ***Garra roseae*** Mousavi-Sabet, Saemi-Komsari, Doadrio & Eagderi, 2019 [E]-[NE], Rose's garra/Tang-e-Sarhe stream, Makran basin (Mousavi-Sabet et al., 2019a).

72. ***Garra rossica*** (Nikol'skii, 1900) [N]-[NE], Hari garra/Hari, Bedjestan, Sistan, Lut, Hamun-e Jaz Murian, Mashkid and Makran basin (Esmaeili et al., 2016d).

73. ***Garra rufa*** (Heckel, 1843) [N]-[LC], Red garra/ Tigris and Persis (Persian Gulf basin) and Maharlu Lake basin (Esmaeili et al., 2016c).

74. ***Garra tashanensis*** Mousavi-Sabet, Vatandoust, Fatemi & Eagderi, 2016 [E]-[NE], Tashan blind cave garra/ subterranean waters in the Tigris drainage (Persian Gulf basin) (Mousavi-Sabet et al., 2016a).

75. ***Garra tiam*** Zamani-Faradonbe, Keivany, Dorafshan & Zhang, 2021 [E]-[NE], Tiam garra/Karun River drainage (Tigris basin) (Zamani-Faradonbe et al., 2021b).

76. ***Garra typhlops*** (Bruun & Kaiser, 1944) [E]-[VU], Discless blind cave garra/subterranean waters in the Tigris drainage (Persian Gulf basin) (Esmaeili et al., 2016c).

Genus *Labeo* Cuvier, 1816

77. ***Labeo rohita*** (Hamilton, 1822) [I]-[LC], Roho labeo/Tigris drainage (Persian Gulf basin) (Eagderi et al., 2019c).

Genus *Luciobarbus* Heckel, 1843

78. ***Luciobarbus barbulus*** (Heckel, 1847) [N]-[NE], Qarah Aqaj barbel/Helleh, Mond, Zohreh and Tigris (Persian Gulf basin) (Khaefi et al., 2017b).

79. ***Luciobarbus brachycephalus*** (Kessler, 1872) [N]-[VU], Aral barbel/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

80. ***Luciobarbus capito*** (Güldenstädt, 1773) [N]-[VU], Bulatamai barbel/Caspian Sea basin (Eagderi et al., 2013; Esmaeili et al., 2018).

81. ***Luciobarbus conocephalus*** (Kessler, 1872) [N]-[NE], Hari barbel /Hari basin (Eagderi et al., 2021).

82. ***Luciobarbus esocinus*** Heckel, 1843 [N]-[VU], Pike barbel/Tigris (Persian Gulf basin) (Esmaeili et al., 2017a, 2018).

83. ***Luciobarbus kersin*** (Heckel, 1843) [N]-[DD], Kersin barbel/Tigris (Persian Gulf basin) (Khaefi et al., 2018).

84. ***Luciobarbus mursa*** (Güldenstädt, 1773) [N]-[LC], Mursa/Caspian Sea and Urmia Lake basins (Esmaeili et al., 2017a, 2018).

85. ***Luciobarbus subquincunciatus*** (Günther, 1868) [N]-[CR], Leopard barbel/Tigris (Persian Gulf basin) (Esmaeili et al., 2017a, 2018).

86. ***Luciobarbus xanthopterus*** Heckel, 1843 [N]-[VU], Gattan/Tigris (Persian Gulf basin) (Esmaeili et al., 2017a, 2018).

Genus *Mesopotamichthys* Karaman, 1971

87. ***Mesopotamichthys sharpeyi*** (Günther, 1874) [N]-[VU], Binni/Tigris and Persis (Persian Gulf basin) (Esmaeili et al., 2017a, 2018).

Genus *Paracapoeta* Turan, Kaya, Aksu & Bektaş, 2022

88. *Paracapoeta trutta* (Heckel, 1843) [N]-[LC], Longspine scraper /Tigris and Zohreh (Persian Gulf basin) (Esmaeili et al., 2018).

89. *Paracapoeta anamisensis* (Zareian, Esmaeili & Freyhof, 2016) [E]-[NE], Minab scraper/Makran (Zareian et al., 2016).

90. *Paracapoeta mandica* (Bianco & Bănărescu, 1982) [E]-[NE], Mond scraper/Persis basin (Zareian et al., 2016).

Genus *Schizocypris* Regan, 1914

91. *Schizocypris altidorsalis* Bianco & Bănărescu, 1982 [N]-[LC], Gorgak/Sistan basin (Esmaeili et al., 2017a, 2018).

Genus *Schizopygopsis* Steindachner, 1866

92. *Schizopygopsis stolickai* Steindachner, 1866 [N]-[NE], False Osman/Sistan basin (Esmaeili et al., 2017a, 2018).

Genus *Schizothorax* Heckel, 1838

93. *Schizothorax intermedius* McClelland & Griffith, 1842 [N]-[NE], Common marinka/Sistan basin (Esmaeili et al., 2017a, 2018).

94. *Schizothorax pelzami* Kessler, 1870 [N]-[LC], Transcaspian Marinka/Hari River and Kavir basins (Esmaeili et al., 2018; Mouludi-Saleh et al., 2020a).

95. *Schizothorax zarudnyi* (Nikol'skii, 1897) [N]-[NE], Sistan Marinka/Sistan basin (Esmaeili et al., 2017a, 2018).

Genus *Tariqilabeo* Mirza & Saboohi, 1990

96. *Tariqilabeo adiscus* (Annandale, 1919) [N]-[NE], Sistan Latia/Sistan basin (Sayyadzadeh et al., 2015b).

97. *Tariqilabeo diplochilus* (Heckel, 1838) [N]-[NE], Kashmir Latia/Mashkid and Makran basins (Sayyadzadeh et al., 2015b).

Family Danionidae

Genus *Barilius* Hamilton, 1822

98. *Barilius mesopotamicus* Berg, 1932 [N]-[LC], Mesopotamian minnow/Tigris and Persis (Persian Gulf basin) (Esmaeili et al., 2017a, 2018).

Genus *Cabdio* Hamilton, 1822

99. *Cabdio morar* (Hamilton, 1822) [N]-[LC], Morar/Makran and Mashkid basin (Esmaeili et al., 2015; Radkhah et al., 2022a).

Family Gobionidae

Genus *Gobio* Cuvier, 1816

100. *Gobio nigrescens* (Keyserling, 1861) [N]-[NE], Hari gudgeon/Hari basin (Mousavi-Sabet et al., 2016b).

Genus *Pseudorasbora* Bleeker, 1859

101. *Pseudorasbora parva* (Temminck & Schlegel, 1846) [I]-[LC], Topmouth gudgeon/Introduced to the Caspian Sea, Namak Lake, Hari River, Sistan, Maharlu, Urmia, Persis and Tigris River drainage and probably elsewhere (Ganjali et al., 2021).

Genus *Romanogobio* Bănărescu, 1961

102. *Romanogobio macropterus* (Kamensky, 1901) [N]-[LC], South Caucasian gudgeon/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

103. *Romanogobio persus* (Günther, 1899) [E]-[NE], Persian gudgeon/Urmia Lake basin (Esmaeili et al., 2017a, 2018).

Family Leuciscidae

Genus *Abramis* Cuvier, 1816

104. *Abramis brama* (Linnaeus, 1758) [N]-[LC], Common bream/the Caspian Sea basin and introduced to the Urmia Lake basin (Sahraeian et al., 2016).

Genus *Acanthobrama* Heckel, 1843

105. *Acanthobrama marmid* Heckel, 1843 [N]-[LC], Mesopotamian bream/Tigris (Persian Gulf basin) (Esmaeili et al., 2018; Abbasi Ranjbar et al., 2018).

106. *Acanthobrama microlepis* (De Filippi, 1863) [N]-[LC], Blackbrow bleak/Caspian Sea basin (Esmaeili et al., 2018; Abbasi Ranjbar et al., 2018).

107. *Acanthobrama persidis* (Coad, 1981) [E]-[NE], Persian bleak, Kor bleak/Kor, Persis, Maharlu Lake, and Hormuz basins (Teimori et al., 2015).

108. *Acanthobrama urmianus* (Günther, 1899) [E]-[DD], Urmia bream/Urmia Lake basin (Esmaeili et al., 2018; Abbasi Ranjbar et al., 2018).

Genus *Alburnoides* Jeitteles, 1861

109. *Alburnoides damghani* Jouladeh-Roudbar, Eagderi, Esmaeili, Coad & Bogutskaya, 2016 [E]-[NE], Damghan spirlin, Damghan riffle minnow/Kavir basin (Jouladeh-Roudbar et al., 2016).

110. *Alburnoides eichwaldii* (De Filippi, 1863) [N]-[LC], South western Caspian spirlin, Eichward's riffle minnow/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

111. *Alburnoides holciki* Coad & Bogutskaya, 2012 [N]-[NE], Hari spirlin, Holcik's riffle minnow/Hari and the Caspian Sea/Atrak River basins (Jouladeh-Roudbar et al., 2020).

112. *Alburnoides namaki* Bogutskaya & Coad, 2009 [E]-[NE], Namak spirlin, Namak riffle minnow/Namak Lake basin (Esmaeili et al., 2017a, 2018).

113. *Alburnoides nicolausi* Bogutskaya & Coad, 2009 [E]-[NE], Seimareh spirlin, Karkheh spirlin, Nicholas' riffle minnow/Tigris (Persian Gulf basin) (Esmaeili et al., 2017a, 2018).

114. *Alburnoides petrubanarescui* Bogutskaya & Coad, 2009 [E]-[NE], Urmia spirlin, Banarescu's riffle minnow/Urmia Lake basin (Esmaeili et al., 2017a, 2018).

115. *Alburnoides qanati* Coad & Bogutskaya, 2009 [E]-[NE], Kor spirlin, Qanat spirlin/Kor and Sirjan basins (Esmaeili et al., 2017a, 2018).

116. *Alburnoides samiii* Mousavi-Sabet, Vatandoust & Doadrio, 2015 [E]-[NE], Sefidrud spirlin, Samii riffle minnow/Caspian Sea basin (Mousavi-Sabet et al., 2015a).

117. ***Alburnoides tabarestanensis*** Mousavi-Sabet, Anvarifar & Azizi, 2015 [E]-[NE], Tajan spirlin/Caspian Sea basin (Mousavi-Sabet et al., 2015b).

Genus *Alburnus* Rafinesque, 1820

118. ***Alburnus atropatenae*** Berg, 1925 [E]-[NE], Urmia bleak, Urmia shemaya/Urmia Lake basin (Esmaeili et al., 2017a, 2018; Mouludi-Saleh et al., 2022a).

119. ***Alburnus caeruleus*** Heckel, 1843 [N]-[LC], Black spotted bleak/Tigris (Persian Gulf basin) (Esmaeili et al., 2017a, 2018).

120. ***Alburnus chalcoides*** (Güldenstadt, 1772) [N]-[LC], Caspian shemaya/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

121. ***Alburnus doriae*** De Filippi, 1865 [E]-[NE], Doria bleak/Esfahan, Namak, Tigris (Persian Gulf) basins (Mohammadian-Kalat et al., 2017).

122. ***Alburnus filippii*** Kessler, 1877 [N]-[LC], Kura bleak/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

123. ***Alburnus hohenackeri*** Kessler, 1877 [N]-[LC], Transcaucasian bleak/native in the Caspian Sea basin and translocated to other basins in Iran (Zareian et al., 2013).

124. ***Alburnus sellal*** Heckel, 1843 [N]-[LC], Mesopotamian bleak/Tigris, Zohreh, Persis and Hormuz basins (Mohammadian-Kalat et al., 2017; Eagderi et al., 2019b).

125. ***Alburnus taeniatus*** Kessler, 1874 [N]-[NE], Striped bystranka/Hari basin (Jouladeh-Roudbar et al., 2016).

Genus *Ballerus* Heckel, 1843

126. ***Ballerus sapa*** (Pallas, 1814) [N]-[LC], White-eye bream/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

Genus *Blicca* Heckel, 1843

127. ***Blicca bjoerkna*** (Linnaeus, 1758) [N]-[LC], Silver bream/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

Genus *Chondrostoma* Agassiz, 1832

128. ***Chondrostoma cyri*** Kessler, 1877 [N]-[LC], Southern Caspian nase/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

129. ***Chondrostoma esmaeilii*** Eagderi, Jouladeh-Roudbar, Birecikligil, Çiçek & Coad, 2017 [E]-[NE], Tigris nase/Tigris (Persian Gulf basin) (Eagderi et al., 2017b).

130. ***Chondrostoma orientale*** Bianco & Bănărescu, 1982 [E]-[NE], Kor nase/Kor basin (Esmaeili et al., 2017a, 2018).

131. ***Chondrostoma regium*** (Heckel, 1843) [N]-[LC], Mesopotamian nase/Tigris, Zohreh (Persian Gulf), and Esfahan basins (Dastanpoor et al., 2021).

Genus *Leucaspius* Heckel & Kner, 1858

132. ***Leucaspius delineatus*** (Heckel, 1843) [N]-[LC], Moderlieschen/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

Genus Leuciscus Cuvier, 1816

133. ***Leuciscus aspius*** (Linnaeus, 1758) [N]-[LC], Asp, European asp/Caspian Sea basin (Esmaeili et al., 2017, 2018; Abbasi et al., 2021a).

134. ***Leuciscus vorax*** (Heckel, 1843) [N]-[LC], Mesopotamian asp/Tigris (Persian Gulf basin) (Esmaeili et al., 2017, 2018).

135. ***Leuciscus latus*** (Keyserling, 1861) [N]-[DD], Transcaspian dace/Transcaspian chub/ Hari basin (Eagderi et al., 2021b)

Genus *Pelecus* Agassiz, 1835

136. ***Pelecus cultratus*** (Linnaeus, 1758) [N]-[LC], Ziege/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

Genus *Petroleuciscus* Bogutskaya, 2002

137. ***Petroleuciscus ulanus*** (Günther, 1899) [E]-[NE], Urmia chub/Urmia Lake basin (Esmaeili et al., 2017a, 2018; Abbasi et al., 2021; Mouludi-Saleh et al., 2022).

Genus *Rutilus* Rafinesque, 1820

138. ***Rutilus frisii*** (Nordmann, 1840) – [N]-[NE], Kutum/Caspian Sea basin (Kuljanishvili et al., 2020).

139. ***Rutilus lacustris*** (Pallas, 1814) [N]-[NE], Roach, Vobla/Caspian Sea basin (Levin et al., 2016; Kuljanishvili et al., 2020).

Genus *Scardinius* Bonaparte, 1837

140. ***Scardinius erythrophthalmus*** (Linnaeus, 1758) [N]-[LC], Rudd, redeye, redfin, pearl roach/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

Genus *Squalius* Bonaparte, 1837

141. ***Squalius berak*** Heckel, 1843 [N]-[LC], Mesopotamian chub/Tigris (Esmaeili et al., 2016a; Khaefi et al., 2016).

142. ***Squalius lepidus*** Heckel, 1843 [N]-[LC], Mesopotamian pike chub/Tigris (Esmaeili et al. 2017a, 2018).

143. ***Squalius namak*** Khaefi, Esmaeili, Sayyadzadeh, Geiger & Freyhof, 2016 [E]-[NE], Namak Lake chub/ Namak Lake basin (Khaefi et al., 2016).

144. ***Squalius turcicus*** De Filippi, 1865 [N]-[LC], Transcaucasian chub/Urmia Lake and southern Caspian Sea basins (Mouludi-Saleh et al., 2020b).

Genus *Vimba* Fitzinger, 1873

145. ***Vimba persa*** (Pallas, 1814) [N]-[LC], Persian vimba, Caspian vimba/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

Family Tincidae

Genus *Tinca* Cuvier, 1816

146. ***Tinca tinca*** (Linnaeus, 1758) [N]-[LC], Tench/ Caspian Sea basin (Esmaeili et al., 2017a, 2018).

Family Xenocyprinidae

Genus *Ctenopharyngodon* Steindachner, 1866

147. ***Ctenopharyngodon idella*** (Valenciennes, 1844) [I]-[NE], Grass carp/Introduced to the Caspian Sea, Tigris River, Kor River, Maharlu Lake, and Sistan basins;

elsewhere in reservoirs throughout Iran (Esmaeili et al., 2017a, 2018).

Genus *Hemiculter* Bleeker, 1859

148. *Hemiculter leucisculus* (Basilewsky, 1855) [I]-[LC], Sharpbelly/introduced to the Caspian Sea basin; probably elsewhere in Iran including Urmia Lake and Tigris River basins (Radkhah & Eagderi, 2021).

Genus *Hypophthalmichthys* Bleeker, 1859

149. *Hypophthalmichthys molitrix* (Valenciennes, 1844) [I]-[NT], Silver carp/introduced to Caspian reservoirs and throughout Iran (Esmaeili et al., 2017a, 2018).

150. *Hypophthalmichthys nobilis* (Richardson, 1845) [I]-[DD], Bighead carp/introduced to Caspian reservoirs and throughout Iran (Esmaeili et al., 2017a, 2018).

Genus *Mylopharyngodon* Peters, 1881

151. *Mylopharyngodon piceus* (Richardson, 1846) [I]-[DD], Black carp/introduced to the Caspian Sea basin (Esmaeili et al., 2017a, 2018).

Superfamily Cobitoidea

Family Cobitidae

Genus *Cobitis* Linnaeus, 1758

152. *Cobitis avicennae* Mousavi-Sabet, Vatandoust, Esmaeili, Geiger & Freyhof, 2015 [E]-[NE], Avicenna spined loach/Tigris (Persian Gulf basin) (Mousavi-Sabet et al., 2015c). Its occurrence has been confirmed in the Sirvan River by Mouludi-Saleh et al. (2022b).

153. *Cobitis faridpaki* Mousavi-Sabet, Vasil'eva, Vatandoust & Vasil'ev, 2011 [E]-[NE], Faridpak's spine loach or Siahrud spined loach/Caspian Sea basin (Mousavi-Sabet et al., 2011).

154. *Cobitis linea* (Heckel, 1847) [E]-[NE], Persepolis or Kor spined loach/Kor basin (Esmaeili et al., 2017a, 2018).

155. *Cobitis saniae* Eagderi**,** Jouladeh-Roudbar, Jalili, Sayyadzadeh & Esmaeili, 2017 [N]-[NE], Sania's spined loach/Caspian Sea basin (Eagderi et al., 2017c).

Genus *Sabanejewia* Vladykov, 1929

156. *Sabanejewia aurata* (De Filippi, 1863) [N]-[LC], Golden spined loach/Caspian Sea basin (Sayyadzadeh et al., 2018a; Çiçek et al., 2022).

157. *Sabanejewia caspia* (Eichwald, 1838) [N]-[NE], Caspian spined loach/Caspian Sea basin (Sayyadzadeh et al., 2018a).

Family Nemacheilidae

Genus *Eidinemacheilus* Hashemzadeh Segherloo, Ghaedrahmati & Freyhof, 2016

158. *Eidinemacheilus smithi* (Greenwood, 1976) [E]-[VU], Zagros blind crested loach/subterranean waters in the Tigris drainage (Persian Gulf basin) (Esmaeili et al., 2017a, 2018).

Genus *Oxynoemacheilus* Bănăraescu & Nalbant, 1967

159. *Oxynoemacheilus bergi* (Gratzianov, 1907) [N]-[LC], Berg Loach/Caspian Sea basin (Mohammadi et al., 2018).

160. *Oxynoemacheilus bergianus* (Derjavin, 1934) [N]-[LC], Safid River stone loach/Caspian Sea, Urmia and Namak lake basins (Mouludi-Saleh and Eagderi, 2021a).

161. *Oxynoemacheilus brandtii* (Kessler, 1877) [N]-[LC], Kura loach/Caspian Sea and Urmia lake basins (Sayyadzadeh et al., 2017).

162. *Oxynoemacheilus chomanicus* Kamangar, Prokofiev, Ghaderi & Nalbant, 2014 [N]-[NE], Choman stone loach/Tigris (Persian Gulf basin) (Kamangar et al., 2014).

163. *Oxynoemacheilus elsae* Eagderi, Jalili & Çiçek, 2018 [N]-[NE], Elsa stone loach/ Urmia Lake basin (Eagderi et al., 2018a).

164. *Oxynoemacheilus euphraticus* (Banarescu & Nalbant, 1964) [N]-[NE], Euphrates stone loach/Tigris (Persian Gulf basin) (Esmaeili et al., 2017a, 2018). Its occurrence has been confirmed in the Sirvan River by Mouludi-Saleh et al. (2022b).

165. *Oxynoemacheilus frenatus* (Heckel, 1843) [N]-[LC], Banded Tigris loach/Tigris (Persian Gulf basin) (Esmaeili et al., 2017a, 2018).

166. *Oxynoemacheilus karunensis* Freyhof, 2016 [E]-[NE], Karun stone loach/Tigris (Persian Gulf basin) (Freyhof, 2016b; Sayyadzadeh & Esmaeili, 2020).

167. *Oxynoemacheilus kiabii* Golzarianpour, Abdoli & Freyhof, 2011 [E]-[NE], Kiabi stone loach/Tigris (Persian Gulf basin) (Golzarianpour et al., 2011).

168. *Oxynoemacheilus kurdistanicus* Kamangar, Prokofiev, Ghaderi & Nalbant, 2014 [N]-[NE], Kurdistan stone loach/Tigris (Persian Gulf basin) (Kamangar et al., 2014).

169. *Oxynoemacheilus longipinnis* (Coad & Nalbant, 2005) [E]-[NE], Ilam stone loach/Tigris (Persian Gulf basin) (Sayyadzadeh et al., 2017).

170. *Oxynoemacheilus marunensis* Sayyadzadeh & Esmaeili, 2020 [E]-[NE], Marun stone loach/Tigris (Persian Gulf basin) (Sayyadzadeh & Esmaeili, 2020).

171. *Oxynoemacheilus parvinae* Sayyadzadeh, Eagderi & Esmaeili, 2016 [E]-[NE], Parvin stone loach/ Tigris (Persian Gulf basin) (Sayyadzadeh et al., 2016).

172. *Oxynoemacheilus persa* (Heckel, 1847) [E]-[NE], Persian stone loach/Kor River, Mond River and Maharlu Lake basins (Sayyadzadeh et al., 2018b).

173. *Oxynoemacheilus tongiorgii* (Nalbant & Bianco, 1998) [E]-[DD], Tongiorgi stone loach//Kor basin (Esmaeili et al., 2017a, 2018).

174. *Oxynoemacheilus zagrosensis* Kamangar, Prokofiev, Ghaderi & Nalbant, 2014 [N]-[NE], Zagros

stone loach/Tigris (Persian Gulf basin) (Kamangar et al., 2014).

175. ***Oxynoemacheilus zarzianus*** Freyhof & Geiger, 2017 [N]-[NE], Zarzian stone loach/Sirvan River (Tigris) (Eagderi et al., 2022).

Genus *Paracobitis* Bleeker, 1863

176. ***Paracobitis abrishamchianorum*** Mousavi-Sabet, Vatandoust, Geiger & Freyhof, 2019 [E]-[NE], Abrishamchi crested loach/Caspian Sea basin (Mousavi-Sabet et al., 2019).

177. ***Paracobitis atrakensis*** Esmaeili, Mousavi-Sabet, Sayyadzadeh, Vatandoust & Freyhof, 2014 [E]-[NE], Atrak crested loach/Caspian Sea and Kavir basins (Esmaeili et al., 2014d).

178. ***Paracobitis basharensis*** Freyhof, Esmaeili, Sayyadzadeh & Geiger, 2014 [E]-[NE], Bashar crested loach/Tigris (Persian Gulf basin) (Freyhof et al., 2014).

179. ***Paracobitis hircanica*** Mousavi-Sabet, Sayyadzadeh, Esmaeili, Eagderi, Patimar & Freyhof, 2015 [E]-[NE], Eastern crested loach/Caspian Sea basin (Mousavi-Sabet et al., 2015d).

180. ***Paracobitis malapterura*** (Valenciennes, 1846) [E]-[NE], Namak Lake crested loach/Namak Lake and Kavir basins (Freyhof et al., 2014).

181. ***Paracobitis molavii*** Freyhof, Esmaeili, Sayyadzadeh & Geiger, 2014 [N]-[NE], Molavi's creasted loach/Tigris (Persian Gulf basin) (Freyhof et al., 2014).

182. ***Paracobitis persa*** Freyhof, Esmaeili, Sayyadzadeh & Geiger, 2014 [E]-[NE], Persian creasted loach/Kor basin (Freyhof et al., 2014).

183. ***Paracobitis rhadinaea*** (Regan, 1906) [N]-[NE], Sistan crested loach/Sistan basin (Sayyadzadeh et al., 2019a).

Genus *Paraschistura* Prokofiev, 2009

184. ***Paraschistura abdolii*** Freyhof, Sayyadzadeh, Esmaeili & Geiger, 2015 [E]-[NE], Abdoli's loach/Kol, Hamun-e Jaz Murian and Sirjan drainage basins (Freyhof et al., 2015).

185. ***Paraschistura alta*** (Nalbant & Bianco, 1998) [N]-[NE], Helmand loach/Sistan basin (Jouladeh-Roudbar et al., 2015b).

186. ***Paraschistura aredvii*** Freyhof, Sayyadzadeh, Esmaeili & Geiger, 2015 [E]-[NE], Anahita loach/Zohreh River drainage (Persian Gulf basin) (Freyhof et al., 2015).

187. ***Paraschistura bampurensis*** (Nikol'skii, 1900) [N]-[NE], Bampur loach/Mashkid, Makran and Hamun-e Jaz Murian basins (Freyhof et al., 2015).

188. ***Paraschistura cristata*** (Berg, 1898) [N]-[NE], Turkmenian crested loach/Hari basin (Freyhof et al., 2015).

189. ***Paraschistura delvarii*** Mousavi-Sabet & Eagderi, 2015 [E]-[NE], Delvari's loach/Mond River (Persis) (Persian Gulf basin) (Mousavi-Sabet and Eagderi, 2015).

190. ***Paraschistura hormuzensis*** Freyhof, Sayyadzadeh, Esmaeili & Geiger, 2015 [E]-[NE], Hormuz loach/Makran basin (Freyhof et al., 2015).

191. ***Paraschistura ilamensis*** Vatandoust & Eagderi, 2015 [E]-[NE], Ilam loach/Tigris (Persian Gulf basin) (Vatandoust and Eagderi, 2015).

192. ***Paraschistura kermanensis*** Sayyadzadeh, Teimori & Esmaeili, 2019 [E]-[NE], Kerman loach/Kerman-Naein basin (Sayyadzadeh et al., 2019b).

193. ***Paraschistura kessleri*** (Günther, 1889) [N]-[NE], Kessler loach/Sistan and Mashkid basins (Freyhof et al., 2015).

194. ***Paraschistura makranensis*** Eagderi, Mousavi-Sabet & Freyhof, 2019 [E]-[NE], Makran loach/Makran basin (Eagderi et al. 2019d).

195. ***Paraschistura naumanni*** Freyhof, Sayyadzadeh, Esmaeili & Geiger, 2015 [E]-[NE], Naumann loach/Maharlu Lake, Persis and Hormuz basins (Freyhof et al., 2015).

196. ***Paraschistura nielseni*** (Nalbant & Bianco, 1998) [E]-[NE], Nielsen's loach/Helleh and Mond River drainages (Persis) (Freyhof et al., 2015).

197. ***Paraschistura susiani*** Freyhof, Sayyadzadeh, Esmaeili & Geiger, 2015 [E]-[NE], Susian loach, Susa loach/Tigris (Persian Gulf basin) (Freyhof et al., 2015).

198. ***Paraschistura turcmenica*** (Berg, 1932) [N]-[NE], Turkmen Loach/Bedjestan, Hari River and Kavir basins (Freyhof et al., 2015).

199. ***Paraschistura turcomana*** (Nikolskii, 1947) [N]-[NE], Turkmen Loach/Hari basin (Mousavi Sabet et al., 2015e).

Genus *Sasanidus* Freyhof, Geiger, Golzarianpour & Patimar, 2016

200. ***Sasanidus kermanshahensis*** (Bănărescu & Nalbant, 1966) [E]-[NE], Kermanshah stone loach/Tigris (Persian Gulf basin) (Freyhof et al., 2016).

Genus *Turcinoemacheilus* Bănărescu & Nalbant, 1964

201. ***Turcinoemacheilus bahaii*** Esmaeili, Sayyadzadeh, Özuluğ, Geiger & Freyhof, 2014 [E]-[NE], Bahaii dwarf loach/Zayandeh River (Esfahan) basin (Esmaeili et al., 2014b).

202. ***Turcinoemacheilus hafezi*** Golzarianpour, Abdoli, Patimar & Freyhof, 2013 [E]-[NE], Hafez dwarf loach/Tigris (Persian Gulf basin) (Esmaeili et al., 2014b).

203. ***Turcinoemacheilus kosswigi*** Banarescu & Nalbant, 1964 [N]-[LC], Zagros dwarf loach/Tigris (Persian Gulf basin) (Nikmehr et al., 2019, 2020).

204. ***Turcinoemacheilus saadii*** Esmaeili, Sayyadzadeh, Özuluğ, Geiger & Freyhof, 2014 [E]-[NE], Saadi dwarf loach/Tigris (Persian Gulf basin) (Esmaeili et al., 2014b).

Subseries Characiphysi
Order Characiformes
Suborder Characoidei
Superfamily Erythrinoidea
Family Serrasalmidae
Genus *Piaractus* Eigenmann, 1903

205. *Piaractus brachypomus* (Cuvier, 1818) [I]-[NE], Pirapitinga/Tigris (Persian Gulf basin) (Esmaeili et al., 2017b).

Subseries Siluriphysi
Order Siluriformes
Family Bagridae
Genus *Mystus* Scopoli, 1777

206. *Mystus pelusius* (Solander, 1794) [N]-[LC], Zugzug Catfish, Tigris mystus/Tigris (Persian Gulf) and Kol River (Hormuz) basins (Esmaeili et al., 2017a, 2018).

207. *Mystus cyrusi* Esmaeili, Sayyadzadeh, Zarei, Eagderi & Mousavi-Sabet, 2022 [E]-[NE], Cyrusi catfish/ Helleh drainage (Persis) (Esmaeili et al. 2022)

Family Siluridae
Genus *Silurus* Linnaeus, 1758

208. *Silurus glanis* Linnaeus, 1758 [N]-[LC], Wels catfish/Caspian Sea and Urmia Lake basins (Esmaeili et al., 2017a, 2018).

209. *Silurus triostegus* Heckel, 1843 [N]-[LC], Mesopotamian catfish/Tigris (Persian Gulf basin) (Esmaeili et al., 2017a, 2018).

Family Sisoridae
Genus *Glyptothorax* Blyth, 1860

210. *Glyptothorax galaxias* Mosavi-Sabet, Eagderi, Vatandoust & Freyhof, 2021 [E]-[NE], Glaxias catfish/ Karun River drainage (Tigris) (Mosavi-Sabet et al., 2021).

211. *Glyptothorax kurdistanicus* (Berg, 1931) [N]-[DD], Kordestan catfish/Tigris (Persian Gulf basin) (Esmaeili et al., 2017a, 2018).

212. *Glyptothorax silviae* Coad, 1981 [E]-[NE], Southern catfish/Tigris and Persis (Persian Gulf basin) (Esmaeili et al., 2017a, 2018).

213. *Glyptothorax alidaeii* Mosavi-Sabet, Eagderi, Vatandoust & Freyhof, 2021 [E]-[NE], Alidaeii's catfish/ Karkheh drainage (Tigris) (Mosavi-Sabet et al., 2021).

214. *Glyptothorax hosseinpanahii* Mosavi-Sabet, Eagderi, Vatandoust & Freyhof, 2021 [E]-[NE], Hosseinpanahii catfish/Zohreh River drainage (Persian Gulf basin) (Mosavi-Sabet et al., 2021).

215. *Glyptothorax pallens* Mosavi-Sabet, Eagderi, Vatandoust & Freyhof, 2021 [E]-[NE], Pallens sucking catfish/Sirvan River drainage (Tigris) (Mosavi-Sabet et al., 2021).

216. *Glyptothorax shapuri* Mosavi-Sabet, Eagderi, Vatandoust & Freyhof, 2021 [E]-[NE], Shapuri catfish/ Helleh drainage (Persis) (Mosavi-Sabet et al., 2021).

Family Heteropneustidae
Genus Heteropneustes Bloch, 1794

217. *Heteropneustes fossilis* (Bloch, 1794) [I]-[LC], Stinging catfish/introduced to the Tigris River drainages (Persian Gulf basin) (Esmaeili et al., 2018).

Superorder Protacanthopterygii
Order Salmoniformes
Family Salmonidae
Genus *Coregonus* Linnaeus, 1758

218. *Coregonus lavaretus* (Linnaeus, 1758) [I]-[VU], European whitefish/Namak Lake basin (Esmaeili et al., 2017, 2018).

Genus *Oncorhynchus* Suckley, 1861

219. *Oncorhynchus mykiss* (Walbaum, 1792) [I]-[NE], Rainbow trout/introduced to the Tigris, Caspian Sea, Urmia Lake, Namak Lake, Kavir, Esfahan and Kor River basins, and widely farmed (Esmaeili et al., 2017a, 2018).

Genus *Salmo* Linnaeus, 1758

220. *Salmo caspius* Kessler, 1877 [N]-[NE], Caspian trout/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

221. *Salmo trutta* Linnaeus, 1758 [I]-[LC], Brown trout/Caspian Sea, Urmia lake and Namak basins (Esmaeili et al., 2017a, 2018).

Genus *Stenodus* Richardson, 1836

222. *Stenodus leucichthys* (Güldenstädt, 1772) [N]-[EW], Inconnu, Sheefish/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

Order Esociformes
Family Esocidae
Genus *Esox* Linnaeus, 1758

223. *Esox lucius* Linnaeus, 1758 [N]-[LC], Northern pike/Caspian Sea basin; introduced in some lakes and reservoirs of Iran (Esmaeili et al., 2017a, 2018).

Order Gadiformes
Family Gadidae
Genus *Lota* Oken, 1817

224. *Lota lota* (Linnaeus, 1758) [N]-[LC], Burbot/ Caspian Sea basin (Esmaeili et al., 2017a, 2018).

Series Percomorpha
Subseries Gobiida
Order Gobiiformes
Family Gobiidae
Genus *Anatirostrum* Iljin, 1930

225. *Anatirostrum profundorum* (Berg, 1927) [N]-[NE], Duckbill goby, Duckbill pugolovka/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

Genus *Benthophilus* Eichwald, 1831

226. *Benthophilus abdurahmanovi* Ragimov, 1978 [N]-[NE], Abdurakhmanov's tadpole goby/Caspian Sea basin (Abbasi, 2017).

227. *Benthophilus baeri* Kessler, 1877 [N]-[NE], Baer pugolovka/Caspian Sea basin (Abbasi, 2017).

228. *Benthophilus ctenolepidus* Kessler, 1877 [N]-[NE], Transparent tadpole goby/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

229. *Benthophilus granulosus* Kessler, 1877 [N]-[LC], Granular tadpole gobt, Granular pugolovka/Caspian Sea basin (Abbasi, 2017).

230. *Benthophilus leobergius* Berg, 1949 [N]-[LC], Caspian stellate tadpole gob /Caspian Sea basin (Abbasi, 2017; Zarei et al., 2021a).

231. *Benthophilus macrocephalus* (Pallas, 1787) [N]-[LC], Caspian tadpole goby, bighead tadpole goby/Caspian Sea basin (Abbasi, 2017).

232. *Benthophilus pinchuki* Ragimov, 1982 [N]-[NE], Pinchuk tadpole goby/Caspian Sea basin (Abbasi, 2017).

Genus *Boleophthalmus* Valenciennes, 1837

233. *Boleophthalmus dussumieri* Valenciennes, 1837 [N]-[NE], Dussumier's mudskipper/Tigris, Persis, Hormuz and Makran basins (Esmaeili et al., 2017a, 2018).

Genus *Glossogobius* Gill, 1859

234. *Glossogobius giuris* (Hamilton, 1822) [N]-[LC], Tang Goby/Hormuz and Makran basins (Esmaeili et al., 2017a, 2018).

Genus *Knipowitschia* Iljin, 1927

235. *Knipowitschia caucasica* (Berg, 1916) [N]-[LC], Caucasian dwarf goby/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

236. *Knipowitschia iljini* Berg, 1931 [N]-[NE], Iljin's dwarf goby/Caspian Sea basin (Esmaeili et al. 2017, 2018).

237. *Knipowitschia longecaudata* (Kessler, 1877) [N]-[LC], Longtail dwarf goby/Caspian Sea basin (Abbasi, 2017).

Genus *Mesogobius* Bleeker, 1874

238. *Mesogobius nonultimus* (Iljin, 1936) [N]-[NE], Caspian toad goby/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

Genus *Neogobius* Iljin, 1927

239. *Neogobius bathybius* (Kessler, 1877) [N]-[NE], Deepwater goby/Caspian Sea basin (Zarei et al., 2021).

240. *Neogobius caspius* (Eichwald, 1831) [N]-[NE], Caspian goby/Caspian Sea basin (Esmaeili et al., 2017a, 2018; Nikmehr et al., 2021).

241. *Neogobius melanostomus* (Pallas, 1814) [N]-[LC], Round goby, black spotted goby/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

242. *Neogobius pallasi* (Berg, 1916) [N]-[LC], Caspian sand goby/Caspian Sea basin (Esmaeili et al., 2017a, 2018; Nikmehr et al., 2021).

Genus *Periophthalmus* Bloch & Schneider, 1801

243. *Periophthalmus waltoni* Koumans, 1941 [N]-[LC], Walton's mudskipper/Tigris, Persis, Hormuz, and Makran basins (Esmaeili et al., 2017a, 2018).

Genus *Ponticola* Iljin, 1927

244. *Ponticola cyrius* (Kessler, 1874) [N]-[LC], Kura River goby/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

245. *Ponticola goebelii* (Kessler, 1874) [N]-[NE], Caspian ratan or rotan goby/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

246. *Ponticola gorlap* (Iljin, 1949) [N]-[LC], Caspian bighead goby/Caspian Sea basin (Esmaeili et al., 2017, 2018).

247. *Ponticola hircaniaensis* Zarei, Esmaeili, Kovačić, Schliewen & Abbasi, 2022 [E]-[NE], Hircaniaen bighead goby/Caspian Sea basin (Zarei et al., 2022).

248. *Ponticola iranicus* Vasil'eva, Mousavi-Sabet & Vasil'ev, 2015 [E]-[NE], Persian goby/Caspian Sea basin (Vasil'eva et al., 2015).

249. *Ponticola patimari* Eagderi, Nikmehr & Poorbagher, 2020 [E]-[NE], Patimar goby/Caspian Sea basin (Eagderi et al., 2020c).

250. *Ponticola ratan* (Nordmann, 1840) [N]-[NE], Ratan goby/Caspian Sea basin (Abbasi, 2017).

251. *Ponticola syrman* (Nordmann, 1840) [N]-[LC], Syrman goby/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

Genus *Proterorhinus* Smitt, 1900

252. *Proterorhinus nasalis* (De Filippi, 1863) [N]-[LC], Eastern tubenose goby/Caspian Sea basin (Zare et al., 2021a).

Genus *Rhinogobius* Gill, 1859

253. *Rhinogobius lindbergi* Berg 1933 [I]-[NE], Amur goby/Caspian Sea, Urmia Lake, Hari, Persian Gulf basins (Eagderi and Moradi, 2017; Eagderi et al., 2018b).

Genus *Scartelaos* Swainson, 1839

254. *Scartelaos tenuis* (Day, 1876) [N]-[LC], Indian Ocean slender mudskipper/Tigris, Persis, Hormuz, and Makran basins (Esmaeili et al., 2017a, 2018).

Subseries Ovalentaria

Order Mugiliformes

Family Mugilidae

Genus *Chelon* Artedi, 1793

255. *Chelon auratus* (Risso, 1810) [I]-[LC], Golden grey mullet/Caspian Sea basin (Durand and Borsa, 2015).

256. *Chelon saliens* (Risso, 1810) [I]-[LC], Leaping mullet/Caspian Sea basin (Durand and Borsa, 2015).

Genus *Ellochelon* Whitley, 1930

257. *Ellochelon vaigiensis* (Quoy & Gaimard, 1825) [N]-[LC], Squaretail mullet/Tigris; possibly other coastal rivers in the Persian Gulf (Esmaeili et al., 2017a, 2018).

Genus *Mugil* Linnaeus, 1758

258. *Mugil cephalus* Linnaeus, 1758 [N]-[LC], Flathead mullet/The Caspian Sea (Exotic), Tigris and Makran basins; possibly other coastal rivers in the Persian Gulf (Esmaeili et al., 2017, 2018).

Genus *Planiliza* Whitley, 1945

259. *Planiliza abu* (Heckel, 1843) [N]-[LC], Abu mullet/Tigris, Persis, and Hormuz; possibly introduced in the Lake Maharlu basin (Durand and Borsa, 2015; Mouludi-Saleh et al., 2021).

260. *Planiliza subviridis* (Valenciennes, 1836) [N]-[NE], Greenback mullet/Tigris and Persis (Persian Gulf basin) (Durand and Borsa, 2015).

Order Cichliformes

Family Cichlidae

Genus *Amatitlania* Schmitter–Soto, 2007

261. *Amatitlania nigrofasciata* (Günther, 1867) [I]-[NE], Convict cichlid/Namak and Hormuz basins (Esmaeili et al., 2013; Mousavi-Sabet and Eagderi, 2016b).

Genus *Coptodon* Gervais, 1848

262. *Coptodon zillii* (Gervais, 1848) [I]-[NE], Redbelly tilapia/Tigris and Persis (Persian Gulf basin) (Teimori et al., 2017; Radkhah and Eagderi, 2022).

Genus *Iranocichla* Coad, 1982

263. *Iranocichla hormuzensis* Coad, 1982 [E]-[NE], Hormuz cichlid/Mehran River (Hormuz) (Esmaeili et al., 2016d; Schwarzer et al., 2016).

264. *Iranocichla persa* Esmaeili, Sayyadzadeh & Seehausen, 2016 [E]-[NE], Persis cichlid/Shur, Hasanlangi and Minab River drainages flowing into the Persian Gulf at the Strait of Hormuz (Esmaeili et al., 2016d).

265. *Iranocichla* sp. [E]-[NE], Hormuz (Kol River drainages, see Schwarzer et al., 2016).

Genus *Oreochromis* Günther, 1889

266. *Oreochromis aureus* (Steindachner, 1864) [I]-[LC], Blue tilapia/Tigris (Persian Gulf basin) (Radkhah and Eagderi, 2022).

267. *Oreochromis niloticus* (Linnaeus, 1758) [I]-[NE], Nile tilapia/Persis basin (Rafiee et al., 2017).

Infraseries Atherinomorpha

Order Atheriniformes

Suborder Atherinoidei

Family Atherinidae

Subfamily Atherininae

Genus *Atherina* Linnaeus, 1758

268. *Atherina caspia* Eichwald, 1831 [N]-[NE], Caspian silverside/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

Order Cyprinodontiformes

Superfamily Cyprinodontoidea

Family Aphaniidae

Genus *Aphaniops* Hoedeman, 1951

269. *Aphaniops furcatus* (Teimori, Esmaeili, Erpenbeck & Reichenbacher, 2014) [E]-[NE], Scaleless tooth-carp/Hormuz and Makran basins (Esmaeili et al., 2020b).

270. *Aphaniops ginaonis* (Holly, 1929) [E]-[NE], Geno (Genow) tooth-carp/Hormuz basin (Esmaeili et al., 2020b).

271. *Aphaniops hormuzensis* (Teimori, Esmaeili, Hamidan & Reichenbacher, 2018) [E]-[NE], Hormuz tooth-carp/Mehran River drainage (Esmaeili et al., 2020b; Mouludi-Saleh et al., 2020c; Teimori et al., 2020).

272. *Aphaniops stoliczkanus* (Day, 1872) [N]-[NE], Eastern tooth-carp, Indian tooth-carp/Tigris, Persis, Makran and Mashkid (Esmaeili et al., 2020b).

Genus *Esmaeilius* Freyhof & Yoğurtçuoğlu 2020

273. *Esmaeilius darabensis* (Esmaeili, Teimori, Gholami & Reichenbacher, 2014) [E]-[NE], Darab tooth-carp/Hormuz basin (Esmaeili et al., 2014e).

274. *Esmaeilius persicus* (Jenkins, 1910) [E]-[NE], Persian tooth-carp/ Maharlu Lake basin (Teimori et al., 2011).

275. *Esmaeilius isfahanensis* (Hrbek, Keivany & Coad, 2007) [E]-[NE], Esfahan tooth-carp/Zayandeh Rud (Esfahan) basin (Hrbek et al., 2007).

276. *Esmaeilius shirini* (Gholami, Esmaeili, Erpenbeck & Reichenbacher, 2014) [E]-[NE], Shirin tooth-carp/ endemic to the Kor River basin but has been translocated to the Helleh River drainage (Persis) (Gholami et al., 204; Freyhof & Yoğurtçuoğlu, 2020).

277. *Esmaeilius sophiae* (Heckel, 1849) [E]-[NE], Kor tooth-carp/endemic to the Kor River basin but has been translocated to the Persis and Tigris (Esmaeili et al., 2020b; Freyhof & Yoğurtçuoğlu, 2020).

278. *Esmaeilius vladykovi* (Coad, 1988) [E]-[NE], Zagros tooth-carp/Tigris (Esmaeili et al., 2020b; Freyhof & Yoğurtçuoğlu, 2020).

Genus *Paraphanius* Esmaeili, Teimori, Zarei & Sayyadzadeh, 2020

279. *Paraphanius mento* (Heckel, 1843) [N]-[LC], Iridescent tooth-carp/Tigris (Persian Gulf basin) (Esmaeili et al., 2020b). There is only one record of this species. No recent record.

Superfamily Poecilioidea

Family Poeciliidae

Genus *Gambusia* Poey, 1854

280. *Gambusia holbrooki* Girard, 1859 [I]-[LC], Eastern mosquitofish/introduced and widespread into Iran to provide biological control for mosquitoes (Radkhah et al., 2022b).

Genus *Poecilia* Bloch & Schneider, 1801

281. *Poecilia latipinna* (Lesueur, 1821) [I]-[LC], Sailfin molly/Esfahan and Tigris (Persian Gulf basin) (Moshayedi et al., 2015).

282. *Poecilia reticulata* Peters, 1859 [I]-[NE], Guppy/ Namak basin (Mousavi-Sabet et al., 2014).

Genus *Xiphophorus* Heckel, 1848

283. *Xiphophorus hellerii* Heckel, 1848 [I]-[LC], Green swordtail/Namak Lake and Persis (Esmaeili et al., 2010b; Eagderi et al., 2015).

Order Synbranchiformes

Suborder Mastacembeloidei

Family Mastacembelidae

Genus *Mastacembelus* Scopoli, 1777

284. *Mastacembelus mastacembelus* (Banks & Solander, 1794) [N]-[LC], Mesopotamian spiny eel/Tigris,

Kor and Persis basins. Its presence from the Kor River should be confirmed by specimen (Gholamhosseini et al., 2022).

Order Anabantiformes

Family Channidae

Genus *Channa* Scopoli, 1777

285. *Channa gachua* (Hamilton, 1822) [N]-[LC], Dwarf snakehead/Hamun-e Jaz Murian, Makran and Mashkid basins (Mouludi-Saleh et al., 2019).

Order Syngnathiformes

Suborder Syngnathoidei

Superfamily Syngnathoidea

Family Syngnathidae

Genus *Syngnathus* Linnaeus, 1758

286. *Syngnathus caspius* Eichwald, 1831 [N]-[LC], Caspian pipefish/Caspian Sea basin (Zarei et al., 2021b).

Order Perciformes

Suborder Percoidei

Superfamily Percoidea

Family Percidae

Genus *Perca* Linnaeus, 1758

287. *Perca fluviatilis* Linnaeus, 1758 [N]-[LC], European perch/Caspian Sea basin (Abbasi et al., 2021b).

Genus *Sander* Oken, 1817

288. *Sander lucioperca* (Linnaeus, 1758) [N]-[LC], Pike perch/Caspian Sea basin; introduced to lakes and reservoirs throughout Iran (Esmaeili et al., 2017a, 2018).

289. *Sander marinus* (Cuvier, 1828) [N]-[DD], Estuarine perch/Caspian Sea basin (Esmaeili et al., 2017, 2018).

Order Scorpaeniformes

Suborder Gasterosteoidei

Family Gasterosteidae

Genus *Gasterosteus* Linnaeus, 1758

290. *Gasterosteus aculeatus* Linnaeus, 1758 [I]-[LC], Three-spined stickleback/Caspian Sea, Kavir and Hari basins (Mouludi-Saleh and Eagderi, 2021).

Genus *Pungitius* Coste, 1848

291. *Pungitius platygaster* (Kessler, 1859) [N]-[LC], Ukrainian stickleback/Caspian Sea basin (Esmaeili et al., 2017a, 2018).

Order Spariformes

Family Sparidae

Genus *Acanthopagrus* Peters, 1855

292. *Acanthopagrus arabicus* Iwatsuki, 2013 [N]-[LC], Arabian yellowfin seabream/ /Tigris (Persian Gulf), Hormuz and Persis basins (Esmaeili et al., 2017a, 2018).

4. Discussion

Based on the present checklist, we document the presence of 292 fish species in 19 inland water basins of Iran. The confirmed freshwater lampreys and freshwater fishes of Iran comprise 106 genera, 36 families, 24 orders, and 3 classes. In addition, 43 species are excluded from the checklist. This reveals species richness and a high degree of endemism in the Iranian ichthyofauna. The endemic fish species comprise 35% (102 species) in Iran.

4.1. Alien species

A total of 29 i.e. *Acipenser baerii*, *Amatitlania nigrofasciata*, *Anguilla anguilla*, *Atractosteus spatula*, *Carassius auratus*, *C. gibelio, C. langsdorfii*, *Chelon saliens*, Chelon auratus, *Coptodon zillii*, *Coregonus lavaretus*, *Ctenopharyngodon idella*, *Gambusia holbrooki*, *Gasterosteus aculeatus*, *Hemiculter leucisculus*, *Heteropneustes fossilis*, *Hypophthalmichthys molitrix*, *H. nobilis*, *Labeo rohita*, *Mylopharyngodon piceus*, *Oncorhynchus mykiss*, *Oreochromis aureus*, *O. niloticus*, *Poecilia latipinna*, *P. reticulate*, *Pseudorasbora parva*, *Piaractus brachypomus*, *Rhinogobius lindbergi* and *Xiphophorus hellerii* have been introduced deliberately or accidentally into Iranian inland waters.

4.2. Excluded species

According to three exclusion criteria, 43 recorded fish species in Iranian inland waters are misidentified or erroneously recorded (Table 2). Based on available literature, we present 14 synonyms, 1 erroneously listed species that whose occurrence is geographically impossible and 28 species that need confirmation by the specimen (Table 2). However, we keep this list open for later addenda to insert based on further documentation, which may confirm their occurrence by specimens. The citation of doubtful records without verification had caused a great number of errors (Kottelat and Freyhof 2007); therefore, we rechecked and verified the previous lists based on our expedition during the past 20 years and examination of available materials to us. Furthermore, the first records in scientific journals were carefully read and verified. Therefore, further research and taxonomic revisions are crucial to solve these taxonomic errors that we listed in Table 2.

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