

Review and updated checklist of freshwater fishes of Iran: Taxonomy, distribution and conservation status

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Abstract: This checklist aims to reviews and summarize the results of the systematic and zoogeographical research on the Iranian inland ichthyofauna that has been carried out for more than 200 years. Since the work of J.J. Heckel (1846-1849), the number of valid species has increased significantly and the systematic status of many of the species has changed, and reorganization and updating of the published information has become essential. Here we take the opportunity to provide a new and updated checklist of freshwater fishes of Iran based on literature and taxon occurrence data obtained from natural history and new fish collections. This article lists 288 species in 107 genera, 28 families, 22 orders and 3 classes reported from different Iranian basins. However, presence of 23 reported species in Iranian waters needs confirmation by specimens. The most diverse order is Cypriniformes (171 species, 59.40%), followed by Gobiiformes (42 species, 14.60%), Cyprinodontiformes (17 species, 5.90%), and Clupeiformes (11 species, 3.82%). Eighty-eight endemic species (30.56%) in 7 families and 26 exotic species (9.03%) in 9 families are listed here. Among 288 reported species, 163 (56.6%) species are Not Evaluated (NE), 93 (32.3%) Least Concern (LC), 11 (3.8%) Vulnerable (VU), 8 (2.8%) Data Deficient (DD), 7 (2.4%) Critically Endangered (CR), 3 (1%) Near Threatened (NT), 1 (0.3%) is Endangered (EN) and 1 (0.3%) Extinct in the Wild (EW) of the red list of IUCN. The only reason for this high number of not listed and least concern species in the IUCN Red List is lack of information about the species at national and global levels. This shows the necessity of reconsideration of global categories and application of the IUCN Red List criteria at the national level. Considering the number of endemic fishes (88, 30.56%) in Iran, the first step should be preparing an endemic national assessment for inclusion on the IUCN Red List. Over the last ten years, some native and exotic fishes have been translocated or introduced into natural water bodies. Aquaculture, sport fishing, control of malaria, ornamental purposes, research activities, demonstration in national fairs and accidental introduction are the main reasons for these introductions. Here, we report presence of the Alligator gar, *Atractosteus spatula*, as an introduced predatory fish from Marivan Lake which seems to have been released from an aquarium. In this checklist, additional, problematic species are also listed, the English/common name of each species is provided, the etymology of each genus is given, the conservation status of each species is given and the bibliographic list of most of published literature on the systematics of inland fishes is mentioned. The provided information will be necessary for the development of competent and pragmatic management plans and effective conservation policies.

Keywords: Fish diversity, Endemic species, Exotic species, Ichthyogeography, Ecoregion.

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Introduction

The territory of Iran is important from a zoogeographical point of view (Fig. 1), as it straddles several major ecoregions of the world including the Palaearctic, Ethiopian and Oriental Realms (Nalbant & Bianco 1998; Coad 1998) as well as having some exotic elements from the Nearctic and Neotropical Realms (Esmaeili et al. 2010a,b, 2013a,b, 2014a,b). Iran is also part of the Irano-Anatolian hot spot (Fig. 2) with great floristic and faunistic diversity (Esmaeili et al. 2014a-f, 2014a,b, 2016a-e; Freyhof et al. 2014,2015,2016; Ghasemi et al. 2015; Jouladeh-Roudbar et al. 2015a-c, 2016-a-c; Keivany et al. 2016; Eagderi et al. 2017). Moreover, Iran is situated at the conjunction of three climatic zones: the Mediterranean, the arid West Asian, and the temperate humid/semi-humid Caspian zone. Nevertheless, it lies predominantly in an arid environmental zone. The Zagros and Alborz Mountains are the two main mountain chains in western and northern Iran, which comprise nearly a third of the Iranian land area. Geologically, Iran is a part of the Alpine-Himalayan orogenic belt, divided into five major structural zones: a) Zagros Range, b) Sanandaj-Sirjan Range, c) Central Iran, d) East and South-East Iran and e) Alborz and Kopet Dagh Ranges (Fig. 3). However, more detailed divisions exist (Malek-Hosseini & Zamani 2017). The geology of Iran suggests rapid isolation of multiple areas from one another. Extensive indentation of the Arabian plate into the Iranian plate starting 10 million years ago (Dercourt et al. 1986; Hatzfeld et al. 2010) caused uplifting of the Zagros Mountains at the southern edge of the Iranian plate. Continued northeastern movement of the Arabian plate and a northerly movement of India resulted in additional mountain building by 5 million years ago along the northern edge of the Iranian plateau as well as along the sutures of the Iranian, Lut, and Helmand plates (see Angiolini et al. 2007; Hatzfeld et al. 2010) making different drainage basins (Figs. 3, 4). These

events have affected the gene flow of different populations present in this area and have provided preliminary population isolations, promoting speciation and causing high ichthyodiversity in Iran.

The first extensive discussion of freshwater fishes within Iran, with descriptions of new taxa, dates back to the middle of the 19th century with the work of Johann Jakob Heckel (1846-1849b). Subsequent studies have yielded dramatic increases in our knowledge of the biodiversity of Iranian freshwater fishes and accounts have been published by many authors in different countries describing fishes subsequently found in Iran. Early works of particular relevance to Iran include those by Graf Eugen Keyserling (1861, 1863), Filippo de Filippi (1863, 1864, 1865), Aleksandr Mikhailovich Nikol'skii (1897, 1899), and Lev Semenovich Berg (1949).

In more recent years, Coad (1988) listed 155 species in 67 genera, 24 families, 15 orders and 3 classes found in 19 drainage basins of Iran. He reported the greatest diversity in the southern Caspian Sea basin comprising 74 species and 42 genera followed by the Tigris River basin with 54 species and 28 genera. These are large basins with diverse habitat and connection to a brackish or marine environment (Coad 1988) which help to provide such high diversity. Later, Coad (1995) listed 150 species in 25 families, 14 orders and 3 classes found in the 19 drainage basins.

Fifteen years later Esmaeili et al. (2010a) listed 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. Additional records, new descriptions and revalidations have increased the number of species known (see Esmaeili et al. 2011a,b, 2012a,b; 2013a,b, 2014a-f; 2015a,b; Teimori et al. 2010, 2011, 2012, 2014, 2015a,b; Gholami et al. 2014, 2015a,b; Kamangar et al. 2014; Sayyadzaedeh et al.

2015a,b, Freyhof et al. 2014, 2015; Mousavi-Sabet & Eagderi 2014, 2015). In the last checklist, Jouladeh-Roudbar et al. (2015) 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%). The most



Fig. 1. Map of the zoogeographic regions of the world showing Iranian ichthyofaunal elements (Palearctic, African, Oriental) and few exotics from Neotropical and Nearctic realms.

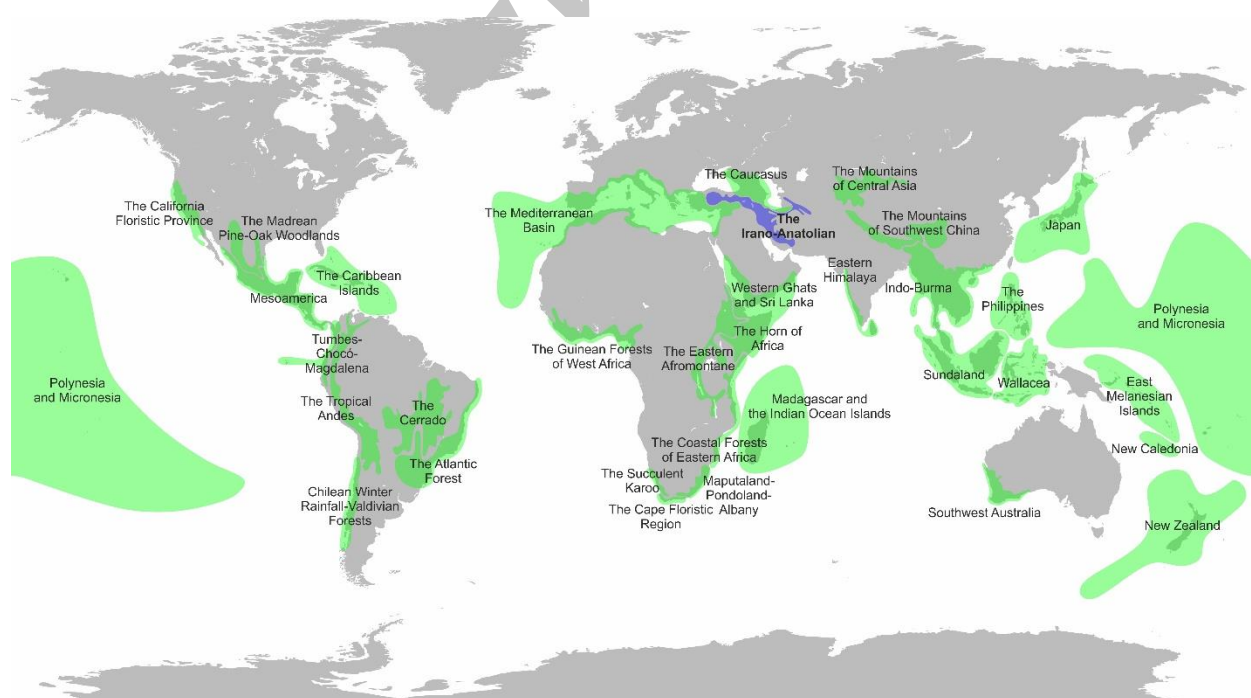


Fig. 2. Hotspots of the world including the Irano-Anatolian.

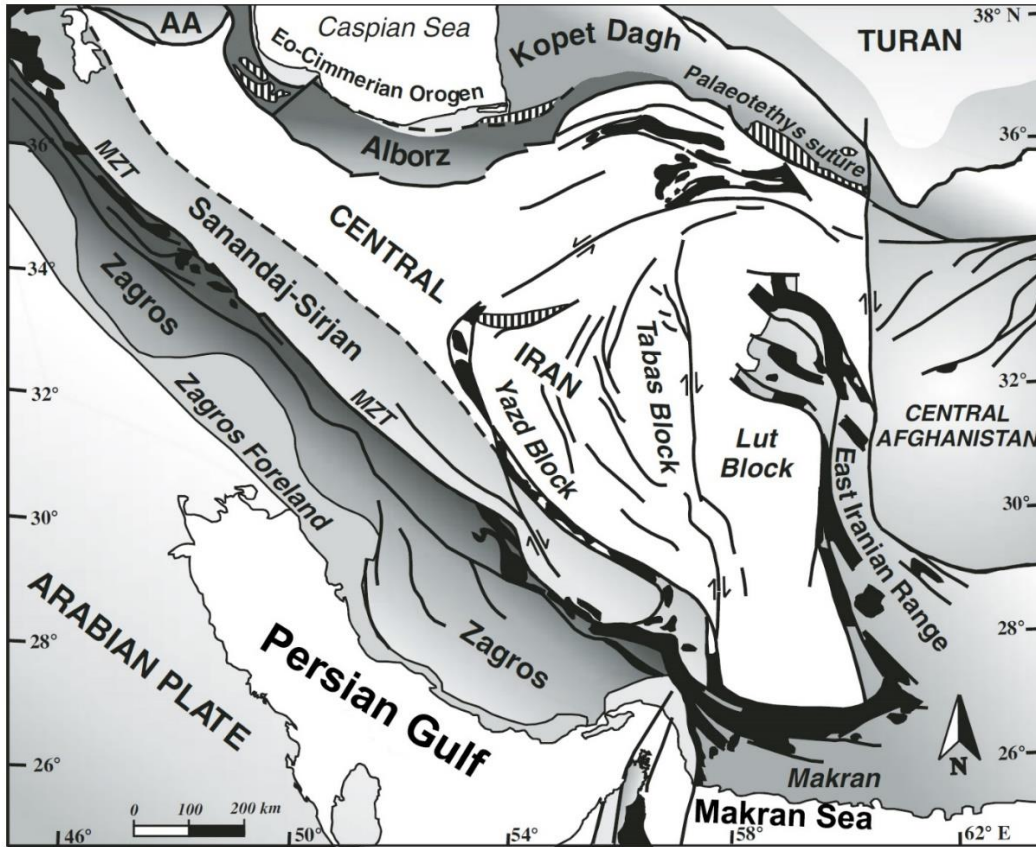


Fig. 3. Geological overview of the Iranian plateau, shaping the major drainage basins (Angiolini et al. 2007).



Fig. 4. Map of Iran showing different basins, (M= Maharlu).

diverse family is the Cyprinidae with 111 confirmed species (43.19%) followed by Nemacheilidae (44 species, 17.12%), Gobiidae (24 species, 9.34%), Cyprinodontidae (14 species, 5.45%), Clupeidae (10 species, 3.89%), Cobitidae (7 species, 2.72%) and Salmonidae (7 species, 2.72%). Abdoli (2016) listed and illustrated 166 and Keivany et al. (2016) 163 species from inland waters of Iran, excluding the Caspian Sea, mostly based on their own collections.

The checklist of each basin is also provided in recent years. Esmaeili et al. (2014b) reported a total of 119 species belonging to 63 genera, 18 families, 16 orders and two classes from southern Caspian Sea basin (SCSB), including 19 exotic fish species in seven families. The number of species was higher than two published checklists in 1988 (74 species and 42 genera) and in 2010 (116 confirmed species belonging to 61 genera and 18 families). The ichthyofauna of the southern Caspian Sea has been of great importance for modern biological research.

Until 2010, 40 confirmed species belonging to 29 genera and 12 families were reported from the Persis region of Iran (Esmaeili et al. 2010a). The count reached 44 species in 34 genera, 14 families, 11 orders and one class in 2015 (Esmaeili et al., 2015a). As part of the diverse Persian Gulf basin straddling several countries, the ichthyofauna of the Persis region has been of great importance for modern biological research. In the recent checklist on the endorheic Urmia basin, Ghasemi et al. (2015) listed 29 species in 25 genera, 7 families, 5 orders and one class. The most diverse order was the Cypriniformes with 23 species (79.31%) followed by Salmoniformes and Perciformes (each with 2 species, 6.9%), and Siluriformes and Cyprinodontiformes (each with 1 species, 3.45%). The most diverse family was the Cyprinidae with 20 species (69%), followed by Nemacheilidae (3 species, 10.3%), Salmonidae (2 species, 6.9%) and Siluridae, Poeciliidae, Percidae and Gobiidae each with

only one species (3.45 %). A changing fish composition during the last 5 years is shown (see Esmaeili et al. 2014a-e; Ghasemi et al. 2015; Jouladeh-Roudbar 2015a-c).

A wide range of articles are now being published on the biology, biogeography and genetic variation of freshwater fishes of Iran (e.g., Borkenhagen et al. 2011; Borkenhagen & Krupp 2013; Ghanbarifardi et al. 2014a,b, 2016; Alwan et al. 2016; Schwarzer et al. 2016; Borkenhagen 2017; Plgar et al. 2017). Hence, providing an updated checklist and an accurate use of scientific names is essential to communicate research results effectively.

This paper presents a checklist of Iranian freshwater fishes including endemics, exotics and transplanted species, with notes on taxonomy. Taxonomic status and information regarding type locality follow Eschmeyer (2017), unless otherwise indicated. References for these conclusions, and type localities for synonyms, are mentioned in the present list. The synonyms are given for those recently used in Iran and do not include those dating from the early twentieth century and the nineteenth century [see Coad (1995, 2014) and Esmaeili et al. (2010a, 2014b) for a fuller treatment of names]. Families are listed following the sequence in Nelson et al. (2016). Genera are listed in alphabetical sequence within each family and species within genera. Order names follow Betancur et al. (2013) and Nelson et al. (2016) although some of them (e.g. Gobiiformes and Cichliformes) have not been fully accepted by some authors. This precautionary approach, however, has its limits. As stated by Kottelat (2013), the development of molecular techniques has led some to recognise as 'species' populations distinguished only by a few nucleotides; complex statistics have been used to justify the recognition of 'species' otherwise not distinguishable by morphology. Providing basic information about nomenclature of fishes and related terms given in this article is useful and is summarized here.

Basic principles of nomenclature

Nomenclature. Nomenclature is about the correct formation and treatment of names and the objective application of the 'legal' criteria of a code, irrespective of taxonomic concepts or philosophical approaches. Taxonomy is about the scientific study of organisms and includes a level of subjective interpretation of observations that may differ among scientists (Kottelat 2013).

Code. Here, the word Code refers to the International Code of Zoological Nomenclature (ICZN, <http://www.iczn.org/iczn/index.jsp>). The International Code of Zoological Nomenclature is the widely accepted convention in zoology that rules the formal scientific naming of organisms treated as animals. The ICZN acts as adviser and arbiter for the zoological community by generating and disseminating information on the correct use of the scientific names of animals. The ICZN is responsible for producing the International Code of Zoological Nomenclature - a set of rules for the naming of animals and the resolution of nomenclatural problems.

ZooBank. Zoobank is the official registry of Zoological Nomenclature, according to the ICZN.

Nomenclatural acts. A nomenclatural act is any published act that affects the nomenclatural status of a scientific name. This includes the creation of names, emendations, designation of types, rulings of the ICZN, etc. Nomenclatural acts are valid if they satisfy the provisions of the Code; they are invalid and must be rejected if they do not follow the Code. Treating a name as a subjective synonym is a taxonomic act, not a nomenclatural act.

Original descriptions. Original description within the meaning of the Code (arts. 10–20) refers to the first use (creation) of an available name (Kottelat 2013).

Available name. An available name is a name that satisfies the criteria of the Code and may be used for a valid species. The main criteria are that a new name must be accompanied by a description and the designation of a

namebearing type (type specimen(s) for new species, type species for new genera; see below). An available name is not automatically a valid name. Since 2012, the Code allows the publication of new names in electronic-only publications if they fulfill a number of conditions. Among them, the work must have an ISSN or ISBN number, be archived, and be registered in Zoobank (www.zoobank.org).

Valid name. A valid name is the correct name applied to a species. To be valid, a name must first be available. But an available name is not automatically valid (junior synonyms are available names but invalid). A 'valid name' should not be confused with a 'valid species'. A nominal species is any of the available names created for a species, irrespective of its validity. If a valid species has x synonyms, the valid name and the x synonyms are $x+1$ nominal species (Kottelat 2013).

Species-group names, genus-group names, family-group names. The species-group includes all the names of taxa of the rank of species and subspecies. The genus-group includes all the names of taxa of the ranks genus and subgenus. The family group includes all the names of taxa ranked above the genus-group: superfamily, family, subfamily, tribes, etc. (Kottelat 2013).

Spellings. A basic principle of nomenclature is that the original spelling (the ones created by the author in the original description) must be retained except for a few exceptions (see Kottelat 2013).

Date of publication. While in everyday language the publication date is more or less equivalent to the date of printing, in the context of nomenclature, the Code defines that the date of publication is the date at which a work could first be obtained (for sale or by free distribution). The date of publication of a work is important to determine priority between two synonyms, two homonyms or two nomenclatural acts. The Code rules that the earliest one has priority over the youngest one (senior synonym vs. junior synonym; senior homonym vs. junior homonym). Even a

difference of one day is enough to give priority. The Code art. 23.9 allows exceptions (reversal of precedence), but only if very precise conditions are met (Kottelat 2013).

Priority, precedence. There is a subtle difference between priority and precedence. Priority indicates seniority, that a work, a name or a nomenclatural act was published before another one. Precedence indicates that a name must be used instead of another, either by application of the principle of priority, or because precedence is reversed for exceptions prescribed by the Code or by rulings of the ICZN (Kottelat 2013).

Authorship. The names of animals are usually followed by the citation of their 'author'. For example, the name of the carp is *Cyprinus carpio* Linnaeus, 1758, in which Linnaeus is the author of the name *C. carpio* and 1758 the date of the original description. The citation of the author and year is merely a bibliographic reference. The name of an author is written in parentheses when the name is moved to another genus by subsequent authors. For example, *Alburnoides eichwaldii* (De Filippi, 1863) was originally described as *Alburnus eichwaldii* by De Filippi (1863).

Type species. Each genus-group name has a type species. The type species of a genus name is the species whose name determines the validity of a genus. For example, *Cyprinus carpio* Linnaeus, 1758, is the type species of the genus *Cyprinus* Linnaeus, 1758. If several species are placed in genus X, with type species Xx and this genus is later divided into two genera, the genus which include species Xx will continue to be genus X while the other genus will have another name. If two genera have the same type species, they are objective synonyms. Genus-group names proposed after 1930 without the fixation of a type species are not available (Code art. 13.3) [note that art. 13.3 requires that the fixation be "in the original publication [Art. 68]" and that art. 68 includes, as "type species fixed in the original publication", those established by original designation, by monotypy, by absolute

tautonymy and by Linnaean tautonymy] (Kottelat 2013).

Type genus. Each family-group name has a type genus. The type genus is the genus whose name has been used to form the name of the family. For example, *Silurus* is the name of the genus used to form the family group names Siluridae, Siluriformes, Silurinae, etc. For nomenclature purposes these three words are a single name. Whatever the rank within the family-group, these names retain the same author and date (Kottelat 2013).

Type specimens. Each species-group name has a type. The type of a species name is the specimen on which the name is based; the phrase name-bearing type is more appropriate but, in order to simplify texts, is not usually used. The type specimen is the type of a name, not of a species. It is therefore erroneous to understand the type as a 'model' representation of a species or a specimen to which all specimens must be identical to be called the same species. The type concept is a nomenclatural standard and totally independent of any taxonomic judgements or philosophical theory. The type is only used to objectively define to which species the name must be applied. If the type specimen of the name Yus belongs to species 1, then the name of species 1 is Yus. If the type specimens of the names Yus and Xus belong to species 1, then the names Yus and Xus are synonyms (and the senior one has priority) (Kottelat 2013).

Primary types (name bearing types). Primary types belong to the categories *holotype*, *lectotype*, *neotype* and *syntypes*. Other type categories recognized by the Code are *paratypes* and *paralectotypes* but have no nomenclatural status. Other 'type' categories (e.g. *allotypes*, *topotypes*, *paratopotypes*, *paraneotypes*) are not recognized by the Code, and should not be used. Among them, the word *allotype* is sometime used to designate one of the paratypes of a sex different from that of the holotype; the word *topotype* is used as a shortened way to say "specimens collected at the locality where the primary type was

collected" (Kottelat 2013).

Holotype. The *holotype* is the specimen that has been explicitly designated so (or by a similar wording) in the original description, or if there is clear evidence that the author based the nominal species on a single specimen. There is only one holotype per nominal species. In all cases where there is clear evidence that the author based the species name on more than one specimen but did not designate a holotype, then all these specimens are *syntypes*.

Paratypes. If the nominal species is based on a specimen explicitly designated as holotype and a number of additional specimens are also explicitly designated as types, these are *paratypes*; allotypes are thus paratypes.

Type series. The sum of the holotype and paratypes or the sum of the syntypes is called the *type series*.

Lectotype. In cases where there is no holotype but only a series of syntypes, one of the syntypes may be selected as *lectotype*; it then has the same value as the holotype. The remaining syntypes then become *paralectotypes* and lose their status as primary types. Lectotypes are designated when it is demonstrated or suspected that the type series includes more than one species; it allows the name to be definitively fixed to the nominal species to which the lectotype belongs. Incidentally, the designation of a lectotype also restricts the type locality to the locality of the lectotype, no longer the sum of the localities of the syntypes.

Neotype. If none of the specimens of the original type series remains, or if the holotype or lectotype no longer exist (they have not been preserved, are lost, or destroyed) and if the name cannot be unambiguously linked to a valid species, then (and only then) a specimen can be designated as *neotype* that will have the same function as the holotype. All designations of neotypes that do not fully satisfy these conditions are invalid and must be ignored. Incidentally, the designation of a neotype also fixes the type locality to the locality of the neotype.

Synonyms. The word synonym is used with the meaning it has in the Code that is a new name applied to a species that already had a name. Names erroneously used for a species other than the one originally described under that name are misidentifications. Misidentifications are not synonyms and are not included in this catalogue. The Code rules that in case an author thinks that two names actually refer to a single species (i.e., they are synonyms), the name published first (senior synonym) is the valid name; the name published later (junior synonym) is invalid (cannot be used). The junior synonym nevertheless remains available; should a later author find that the type specimens of the two names actually refer to different species, the junior synonym might be used again (if it satisfies conditions set by the Code).

Type species fixed in the original publication (Article 68).

68.1. Order of precedence in ways of fixation.

If one (or more) species qualifies for fixation as the type species in more than one of the ways provided for in Articles 68.2-68.5, the valid fixation is that determined by reference to the following order of precedence: firstly, original designation [Art. 68.2], then monotypy [Art. 68.3], then absolute tautonymy [Art. 68.4], and lastly Linnaean tautonymy [Art. 68.5].

Recommendation 68A. Citation of type fixation. If a species is qualified for fixation as the type species in more than one of the ways provided for in this Article, only the valid fixation need be cited.

68.2. Type species by original designation. If one nominal species is explicitly designated [Art. 67.5] as the type species when a nominal genus-group taxon is established, that nominal species is the type species (type by original designation) unless the provisions of Article 70.3 apply.

68.2.1. The expressions "gen. n., sp. n.", "new genus and species", or an equivalent, applied before 1931 to only one of two or more new nominal species originally included in a new nominal genus or subgenus, are deemed to be

an original designation if no other type species was explicitly designated.

68.2.2. If, when a nominal genus-group taxon is established without explicit designation of a type species, one originally included new nominal species [Art. 67.2] is given the species-group name *typicus*, *-a*, *-um* or *typus*, that nominal species is deemed to be the type species by original designation.

68.3. **Type species by monotypy.** When an author establishes a new nominal genus-group taxon for a single taxonomic species and denotes that species by an available name, the nominal species so named is the type species. Fixation by this means is deemed to be fixation by monotypy, regardless of any cited synonyms, subspecies, or unavailable names, and regardless of whether the author considered the nominal genus-group taxon to contain other species which he or she did not cite by name, and regardless of nominal species-group taxa doubtfully included or identified.

68.3.1. If a new genus is divided into subgenera at the time its name is established, and if the nominotypical subgenus contains only a single species, that nominal species is deemed to be the type by monotypy of the new nominal genus.

68.4. **Type species by absolute tautonymy.** If a valid species-group name, or its cited synonym, originally included [Art. 67.2] in a nominal genus-group taxon is identical with the name of that taxon, the nominal species denoted by that specific name (if available) is the type species (type species by absolute tautonymy).

Example. The new nominal genus *Aus* Smith contains among its nominal species *Aus xus* (Brown); among the cited synonyms of the latter is the available name *Bus xus aus* Robinson. The type species of *Aus* is *Bus aus* Robinson, not *Bus xus* Brown.

68.5. **Type species by "Linnaean tautonymy".** If, in the synonymy of only one of the originally included nominal species [Art. 67.2] in a nominal genus-group taxon established before 1931, there is cited a pre-1758 name of one word identical with the new

genus-group name, that nominal species is the type species (type species by "Linnaean tautonymy").

Nominal species. Any of the available names created for a species, irrespective of its validity. If a valid species has *x* synonyms, the valid name and the *x* synonyms are *x*+1 nominal species.

Replacement names. If a species name becomes invalid because it is a junior secondary homonym, it must be replaced. The name used for replacement is called substitute name. The substitute name is the next oldest synonym. If there is no available synonym, then a new replacement name is established. The new replacement name takes the same type as the replaced name. For example, Dekkers (1975) treated *Crayracion ocellatus* as a valid species of *Tetraodon* and made it a junior homonym of *Tetraodon ocellatus*. He created the new replacement name *T. steindachneri* to replace the junior homonym. Gaudant (2011) showed that *Brachylebias* Priem, 1908 is a junior synonym of *Aphanius* Nardo, 1827 and that therefore the new name for the Late Miocene species *Brachylebias persicus* Priem, 1908 is *Aphanius persicus* (Priem, 1908). In addition, he stated that a new name has to be assigned to the extant *A. persicus* (Jenkins, 1910) from the Lake Maharlu. Hence, Teimori et al. (2011) introduced *A. farsicus* Teimori, Esmaeili & Reichenbacher, 2011 as replacement name for *A. persicus* (Jenkins, 1910).

Ending and spelling of species names. If the name is based on a modern name, the genitive ending is *-i* for men (e.g. *amirhosseini*, of Amirhossein, *coadi*, of Coad, *holciki*, of Holcik, *nicolausi*, of Nicholas (Latinized), *kiabii* of Kiabi, *smithi*, of Smith, *petrubanarescui*, of Petru Bănărescu, *vladykovi*, of Vladykov); *-ae* for woman (e.g. *parvinae*, of Mrs. Parvin (Parvin Etesami), *ninae*, of Nina, *ekmekciae*, of Ekmekçi), *-arum* for several women together (e.g. *mariarum*, of Mary Inger and Mary Chin), *-orum* for several men together (e.g. *grummorum*, of the brothers Grigorii and Vladimir Grumm-Grzhimaylo) or

for men and women together (e.g., *potaninorum*, of Grigorii Potanin and Aleksandra Potanina, *baluchiorum*, of the inhabitants of Baluchistan). Exception: names of men ending in *-a* may be considered Latinized and become *-ae* (e.g. *vinciguerrae*, of Vinciguerra, *avicennae*, of Avicenna). If the name ends with *-i*, the ending is *-ii* (e.g. *kiabii*, of Kiabi; *saadii*, of Saadi, *molavii*, of Molavi). Names of women ending in *-a* may be considered Latinized and become *-ae* (e.g. *silviae*, of Sylvie, Latinized form of name).

Names based on geographical names. If the name is in the genitive case, it is indeclinable. Example: *cyri* (of Cyrus, the Latin name of Kura River).

If the name is an adjective, it is declined to agree in gender with the genus name. The most common cases are:

Names based on classical and modern Latin adjectives. Examples: *hircanicus*, *-a*, *-um* (Hyrkania, for the southern Caspian Sea region where the species occurs), *persa* (Persis, Iran), *iranica*, *-us*, *-um* (Iran), *mondica*, (Mond River), *sumatranus*, *-a*, *-um* (Sumatran); names based on modern place names with the addition of the ending *-ensis*, *-ensis*, *-ense*). Example: *arakensis*, *basharensis*, *darabensis*, *hormuzensis*, *karunensis*, *kavirensis*, *kermanshahensis*, *idignensis*, *zagrosensis*, *isfahanensis*.

Latin adjectives. Names that are Latin adjectives or participles, or end with Latin adjectives or participles, are declined to agree in gender with the name of the genus.

The most common declinable endings are: *-is*, *is*, *-e*. Examples: *lateralis*, *lateralis*, *laterale* (lateral); *meridionalis*, *meridionalis*, *meridionale* (southern);

-ger, *-gra*, *grum*. Example: *niger*, *nigra*, *nigrum* (black);

-ger, *-gera*, *-gerum*. Example: *filiger*, *filigera*, *filigerum* (that carries a filament)

-fer, *-fera*, *-ferum*. Example: *aurifer*, *aurifera*, *auriferum* (that carries or contains gold).

When declined, some adjectives are identical in the three genders in the nominative case. They

are labelled here as indeclinable. Examples: *elegans* (nice), *splendens* (brilliant, shining), *pallens* (pale).

Compound names (noun-phrases). A compound name made of two nouns is a noun and indeclinable (examples: *ophiolepis*, from ophius, snake, and lepis, scale, with snake scales; *bellibarus*, from the incorrectly Latinized English nouns belly and bar, for the six bars on the belly); names made of an adjective and a noun are also nouns and indeclinable (example: *alticorpus*, from altus, high, and corpus, body, with high body; *flavicauda*, from flavus, yellow, and cauda, tail, with yellow tail, *longicauda*, from longus, long, and cauda, tail, long tail).

Latinized Greek word are adjectives. Among the most common ones in ichthyology are *-ophthalmus*, *-a*, *-um* (-eyed; example: *microphthalmus*, small-eyed), *-rhynchus*, *-a*, *-um* (-snouted; example: *macrorhynchus*, big-snouted), *-cheilus*, *-a*, *-um* (-lipped; example: *pachycheilus*, thick-lipped); *-cephalus*, *-a*, *-um* (-headed; example: *pachycephalus*, broad-headed), *-stomus*, *-a*, *-um* (-mouthed; example: *macrostomus*, large mouthed), *-urus*, *-a*, *-um* (-tailed; example: *stenurus*; slender-tailed), *-gnathus*, *-a*, *-um* (-jawed; example: *prognathus*, prognathous). However, not all Latinized Greek words in compound names are adjectives. Some are nouns; examples: *-pomus* (from *poma*, cover, lid, opercle; the adjective is *-pomatus*, *-a*, *-um*), *soma* (body; the adjective is *-somatus*, *-a*, *-um*). Some nouns may be both; example: the Latinized adjective *-pterus*, *-a*, *-um*, winged, and the Latin noun *ptera*.

Materials and Methods

Study Area. This checklist has been compiled from the works listed in the references (see selected bibliography) and also by examination of ichthyological collections in Iran, e.g., ZM-CBSU, Zoological Museum of Shiraz University, Collection of Biology Department, Shiraz; CMNFI, Canadian Museum of Nature, Ottawa; BMNH, Natural History Museum, London; NMW, the Naturhistorisches Museum

Wien; MZUT, the Istituto e Museo di Zoologia della R. Università di Torino; GUIC, Collection of the Ichthyology Museum, Department of Fisheries Sciences, Faculty of Natural Resources, University of Guilan; IUT-IM, Isfahan University of Technology Ichthyology Museum and extensive field expeditions up to 2017 from different river systems of Iran (Fig. 4).

The drainage basins of Iran. The drainage basins of Iran are shown in the Fig. 4. The delimitation of these basins is somewhat arbitrary. Iran is a mountainous country and much of it is desert. There are thousands of small springs and streams with no present or recent connection to other water bodies. Practical considerations require a large scale. For a long time the Iranian drainage basins have been divided into 19 major basins based on field work, maps, fish distributions, history of research, works on hydrography and areas deemed important for an understanding of zoogeography (see Esmaeili et al. 2010a, 2014a, 2015b; Coad 2017). However, we divide the Persian Gulf basin into 4 main sub-basins including the Tigris, Zohreh, Persis (previously known as Gulf basin) and Hormuz (Hormuzgan) basins which all drain to the Persian Gulf (see Fig. 4).

There are two main types of basin, exorheic where the rivers and lakes drain to the sea and endorheic, where rivers drain to an internal basin such as a lake, or are lost in the desert, and have no connection with the sea. The exorheic basins all fringe the southern part of Iran. The bulk of the basins, in number (15) and area (about 78.1% of Iran), are endorheic. These plateau basins lie at an average altitude of 800 m, alternating with mountains ridges at an average of 2000 m. The salt lakes and flats of these basins are fed primarily by groundwater rather than rain (Issar 1967) and water is lost by evaporation. Wolfart (1987) makes the valuable point that Quaternary environments in the closed or endorheic basins of arid Southwest Asia often have marine and brackish fossils. These are not evidence of marine invasions but

of the increasing salinity derived from the mineral content of rainwater. As the water evaporates it leaves behind the minerals and over ten thousand years or less a saline environment develops.

Endorheic basins. Bejestan, Caspian Sea, Dasht-e Kavir, Dasht-e Lut, Esfahan, Hamun-e Mashkid, Hamun-e Jaz Murian, Kor River, Lake Maharlu, Lake Urmia, Namak Lake, Sirjan, Sistan, Hari (Tedzhen) River, Kerman-Na'in

1) Caspian Sea basin. The Caspian Sea (Darya-ye Khazar, Darya-ye Mazandaran) basin is here taken to include both the rivers draining to that Caspian Sea and the Sea itself within Iranian territorial waters (Fig. 1). Zakeri (1997) records 864 small and large rivers, including the Safid River with a catchment of 67,000 km². Some major river systems of the southern Caspian basin of Iran (see Coad 2017) from west to east are:

I) Aras River: Aras (= Araxes or Araks is a tributary of the Kura River of Azerbaijan) in the west. The main tributaries of the Aras in Iran are the Qareh Su (= black water, draining easily eroded, volcanic soil) draining from the Sabalan mountain at 4810 m (38°15'N, 47°49'E) near Ardabil (38°15'N, 48°18'E), and the Qotur River draining past Zaki mountain at 3079 m on the Turkish border through Khvoy (38°33'N, 44°58'E) to the Azerbaijan border near Jolfa (38°57'N, 45°38'E).

II) Safidrud: Safidrud or Safid River (= Sefid or White from its sediment load, up to 60 g/l), is the only one to completely pierce the Alborz Mountains and has a considerable basin (54,100km²) on the plateau. The Safidrud has the greatest mean discharge of Iranian Caspian Rivers. The Safidrud is formed from the Qezel Owzan from the west and the Shah River (or Shahrud) from the east, which meet on the plateau and flow through a narrow gorge. The headwaters of the Qezel Owzan lie in Kordestan, near the Iraqi border, and so drain part of the northern Zagros Mountains as well as areas near Lake Urmia such as the Sahand mountain (37°44'N, 46°27'E), mountains near

Hamadan (34°48'N, 48°30'E) and the southern slopes of the Alborz Mountains. The Shah River is much shorter (ca. 175 km) than the Qezel Owzan and drains the southern Alborz as far east as Takht-e Soleyman at 4819m (36°22'N, 50°58'E).

III) Chalus River: Draining a mountainous region in the central Alborz Mountains. The main branches of the Chalus River are Kandeivan, Elia and Angoran.

IV) Haraz River: The Haraz (or Heraz) River drains the Alborz mountains east of Tehran and has a number of longitudinal tributaries in the mountains. Lar and Nor are two main tributaries which join to become the Haraz, receiving a few small tributaries near Amol. It is about 185km long with a catchment area of about 5100km².

V) Talar River: This river is located in the southeast Caspian Sea area, flowing through Ghaemshahr City of Mazandaran Province. The Tuji, Tajon, Kesselian, Bezla and Cherat rivers are tributaries. The Talar is about 140km long with a catchment area of about 4700km².

VI) Tajan or Tadjan River (= Garmabrud): The Tajan River is among the major rivers of the Caspian Sea basin. It is about 147km long with a catchment area of about 2800km². This river originates from Hezarjarib and Poshtkuh mountains and is comprised of three main streams, the Tajan, Zaromrud and Sefidrud.

VII) Gorgan and Atrak or Atrak (ancient Sarnois) river drainages are in the south-eastern corner of the Caspian. Their courses are roughly east-west and parallel each other with the Atrak forming part of the border with Turkmenistan. The Qareh Su (= Gharesoo) and Madarsoo are two tributaries of Gorgan River. The Gorgan River is about 253km long with a catchment area of about 13,200km². The Atrak River is fast-flowing, arises in the mountains of Northeastern Iran and flows 563km westward to drain into the southeastern corner of the Caspian Sea. The Atrak headwaters are close to those of the Hari River basin. Its catchment area in Iran is about 22,300km². The Sumbar, Aqband, Garmab, Samlaqan, Tebarak,

Babaaman, Shirindareh and Khartot rivers are some of its tributaries.

2) Dasht-e Kavir Basin (Kavir basin). This basin occupies an immense area of north-central Iran, over 200,000km² in the rain shadow of the Alborz Mountains. Mahdavi & Anderson (1983) detailed the qanat water supply of the margins of this basin. Intermittent streams drain to several kavirs which are grouped together under this basin for convenience. The principal kavirs are the Damghan Kavir in the north, the Sabzevar Kavir in the north-east and the Kavir-e Bozorg (or Great Kavir) occupying much of the basin, being about 450km in east-west extent and 250 km in north-south extent. The Kavir-e Bozorg receives waters exiting from other kavirs. The principal streams entering this basin drain the Alborz Mountains and their eastern extensions in Khorasan. The Alborz peaks exceed 4000m and even to the east the Kuh-e Binalud (36°30'N, 58°55'E) attains 3416m near Neyshabur (36°12'N, 58°50'E) while the lowest points are at an altitude of 650m. The Damghan Kavir receives two major streams from the Alborz, the Damghan River and the Hasanabad River, and other streams dry up in early summer. The Sabzevar Kavir has numerous small and temporary streams which feed it as well as two major streams, the Mureh River, 320km long, and its tributary, the Kalshur River, 240km long. The Kalshur drains the Kuh-e Binalud and flows west to meet the south flowing Mureh. These rivers drain areas rich in salt domes and samples taken show water to be saline and some streams are fishless. Qanats support fishes in this area although the fish only emerge at night in some cases. Ruttner-Kolisko (1964, 1966) and Ruttner & Ruttner-Kolisko (1972, 1973) studied the chemistry and limnology of natural springs and qanats in a mountain area separating this basin from the Bejestan basin. Several factors were found to affect the limnology. Climatic factors were temperature, precipitation and evaporation, edaphic factors were geology, salt content of soil and intensity of waterflow, and pollution by

man and animals was a factor. There was a range in salinity from low (<15mval/l) to high (>120mval/l). Qanat discharges in this area were 20-50l/s. Springs were small and many were dammed to form small pools for livestock. The Hableh River (Hablehrud), Namrud, Shur-e Sabzevar, Shur-e Jajarm and Shur-e Gonabad are the main tributaries found in this basin.

3) Dasht-e Lut (Lut basin). The Dasht-e Lut basin of south-central Iran is ringed by mountains yet has the lowest point on the plateau at 205 m in the Namakzar-e Shahdad. The central portions of this basin are some of the most barren and inhospitable in Iran or indeed the world. Conrad & Conrad (1970) and Gabriel (1938) give descriptions of this desert basin. Intermittent streams drain the mountain ranges around Kerman east to the namakzar or namaksar (= salt waste), north from mountains near Bam (29°06'N, 58°21'E) such as the Kuh-e Jebal Barez (28°30'N, 58°20'E) and Kuh-e Bazman (28°04'N, 60°01'E) which delimit the northern edge of the Hamun-e Jaz Murian basin, west from the slopes of the active volcano Kuh-e Taftan (28°36'N, 61°06'E) and south from the mountain ranges near Birjand (32°53'N, 58°13'E). High points include the Kuh-e Hazaran west of Bam and south of Kerman at 4402 m. Such heights retain snow and have more abundant precipitation which feed streams at least in the mountains. However many minor and some apparently major streams marked on maps are completely dry. Much of the water is absorbed into the ground and tapped by qanats. The Shah River at Birjand is dry through most of the year (Fisher 1968). Tabas (33°36'N, 56°54'E) at the northern end of this basin has numerous qanats (Krinley 1970). The Shahdad River is presumably in this basin based on maps and supplies water to Kerman and some nearby villages. One sample station was polluted by wastes from a rainbow trout farm (Rezaei Tavabi et al. 2009). The Tahrud is an important stream which drains the Hazaran to a small sump in the south of the Dasht-e Lut basin and has a continuous flow which becomes subsurface well east of Bam (compare maps).

Its maximum map extent approaches 250 km. In the mountains, the Tahrud is 1-8m wide and up to 50cm deep. Water temperature was a warm, 15°C on a cool December day. The Dasht-e Lut includes the largest sand dune field in Iran (ca. 10,000km²) which has developed through aeolian erosion. Sand dunes block roads and may well fill in or divert streams. Qanats in this basin can have water temperatures much higher than the few surface streams. One qanat near Bam had a temperature of 25°C in a snowstorm, yet stream temperatures below 10°C are not uncommon.

4) Esfahan. The principal feature of this basin is the Zayandeh River which rises in the Zagros Mountains east of Zardkuh at 4548m (32°22'N, 50°04'E) and flows east for about 300km to its terminal basin, the Batlaq-e Gavkhuni at 32°20'N, 52°47'E, a salt marsh with a salinity of 315‰ (Löfller 1961) and an average depth of about 1m (www.netiran.com/php/artp.php?id=1615, downloaded 19 July 2004). The salt marsh can dry up in summer. Wetlands associated with the terminal basin are a Ramsar Site of 43,000 ha (or 37,000 ha; sources vary as does the size of the marsh seasonally and annually). Associated marshes at the river delta and along its banks are fresh to brackish. These marshes are fed by flooding and by irrigation canals but dry up in late spring or early summer. Flooded areas often freeze over in winter. There is little natural marsh vegetation and flooding occurs over degraded steppe and cultivated land. Water is diverted for irrigation and for domestic and industrial uses. It receives pollution from Esfahan and other urban sources. Esfahan is a major oasis city on the Zayandeh at 32°40'N, 51°38'E with a population over 1.7 million, famous for its bridges (pol in Farsi) among other sites. The Zayandeh basin encompasses about 30,480km² and is connected to the upper Karun River basin (which drains to the Persian Gulf) by the Kuhrang Tunnel constructed in 1953 although first proposed in the early sixteenth century (Fitt 1953; Afifi 1966).

5) Hamun-e Mashkid (Mashkid basin). The

Hamun-e Mashkid (= Mashkel) lies within Pakistan with its western edge on the border with Iran. In this instance hamun means a salt waste. The mountain ranges in this area of Iran are parallel with the Iran-Pakistan border and run in a northwest-southeast direction. The Mashkid River rises to the east of the mountains ringing the Hamun-e Jaz Murian basin and flows east into Pakistan where it receives a right bank tributary, the Rakhshan River, before turning north to flow into the Hamun-e Mashkid. Its total length is ca. 430 km. Two tributaries of the Mashkid within Iran are the Rutak River and the Simish (= Sunish River) which drain the lowlands between Kuh-e Birag (27°35'N, 61°20'E) and the Badamo Range (27°38'N, 62°08'E) from the northwest to enter the Mashkid River southeast of Saravan (27°22'N, 62°20'E). The upper Mashkid River is a small mountain stream, probably with a perennial flow. The lower reaches of this river, and of the Simish, comprise a series of muddy pools of varying size. Some of these pools were isolated and fishless in early December 1977, while larger ones, perhaps 1km long, contained some emaciated specimens. In this area fish are found more abundantly in perennially flowing qanat streams. The Tahlab River and its tributaries drain the eastern slopes of the mountains south of Zahedan. The Tahlab flows in a southeasterly direction into the Hamun over a ca. 160km course. It was dry between Zahedan and Mirjaveh (29°01'N, 61°28'E) in early December 1977. The Ladiz River is a short (ca. 80km) right bank tributary of the Tahlab flowing from Kuh-e Taftan. In its lower reach it was a small stream flowing in the bottom of a deep and wide canyon. The stream banks were white with salt deposits.

6) Hamun-e Jaz Murian (Jaz Murian basin).

The Hamun (= marshy lake, in this instance) is dry for most of the year, but fills with fresh water in winter (Harrison 1941). Its extent is presumably variable, depending on rainfall. It lies at an altitude of about 300m, with a still-subsiding depression within the Jaz Murian plain, and is ringed by mountains. The two

major rivers flowing into the Hamun are the Halil (or Haliri) River, known as the Kharan or Zar Dasht River in its upper reaches, which flows from the neighbourhood of Kuh-e Laleh Zar at 4374m lying to the northwest, and the Bampur River which flows towards the Hamun from the east but follows a southerly course in its upper reaches (Tipper 1921). The source of the Bampur River lies between 1000 and 1500m. The Halil is a longer river (ca. 390km) than the Bampur (ca. 315km) with a stronger and more continuous flow. However, this river was nearly dry downstream of the Jiroft Dam and there was only minimum flow upstream in 2008 during a drought. There is a 130m high dam on the Halil, the Jiroft Dam, 40km upriver of Jiroft. A flood water storage dam at Bazman is 37 m high with a capacity of 3.3 million m³ (www.irna.com, downloaded 26 January 2003). Discharge is only 1-3m³/s in summer. Floods occur (including an historical one which destroyed Jiroft in 1000 A.D., and one in 1993) and river discharge can reach 800 m³/second in 15 hours with an 18m rise in reservoir level in 40 hours and massive sediment transport with turbidity reaching 280 g/l (www.stucky.ch/publication/JIRFLOOD.htm, downloaded 19 July 1999). The Bampur River in late November and early December was flowing in its upper reaches near Karevandar and around Iranshahr and Bampur but was dry between these two areas. Judging from its width and depth below Bampur it probably did not reach the Hamun by surface flow. Most rain at Iranshahr falls in January and February (15 and 52 mm respectively) with none in the remaining months except for rare summer monsoonal rains (Ganji 1960). Irrigation and canal schemes in the Bampur basin suffer from erosion and siltation problems as elsewhere in Iran (Borowicka 1958).

7) Kor River. This basin occupies 26,440km² north and east of Shiraz at a lowest altitude of ca. 1525 m. Its lowest part is occupied by a chloride lake, the third largest lake in Iran, composed of two parts, a northern basin known as Narges or Tashk and a southern basin known

as Neyriz (Niriz) or Bakhtegan. The two basins are not always connected and the southern basin is saltier because major freshwater input is from the north. Löffler (1956, 1957, 1959, 1968, 1981) gives details of this lake. The lake area varies between 1210 and 2400km², with a maximum depth of 1.1-1.7m and a mean depth of 0.5 m. Salinity is 13.7-101.6 g/l and temperatures range from 15°C to 45°C in the shallows. The lake is reported to have dried out completely in 1871, 1933 and 1966 (Cornwallis 1968a) and in 2000 (www.irna.com/newshtm/eng/05142727.htm, IRNA, 26 July 2000). Löffler (1993) considers that this lake may dry out permanently in the near future if abstraction of water from the Kor River for irrigation continues to grow. The drought in 2003 reduced Lake Bakhtegan to a series of puddles. Fluctuations in lake levels affect the freshwater faunas of springs, including fishes, which drain into the lake: high levels swamp the springs with water too saline for fishes to survive. Low levels, however, allow streams to connect and exchange faunas on the lake bed so they are not as isolated as they might appear. Bobek (1963) suggests that there may have been an outflow from this basin to the Persian Gulf at the south-east corner of the lake which was cut off at the end of the Pleistocene by alluvial fans. However Krinsley (1970) maintains that any outlet was closed by the late Pliocene. Major rivers are the Kor (= the classical Araxes) and its tributary the Pulvar (or Sivand) (= the classical Medus) which rise in the Zagros Mountains to the north and north-west and drain to the north-west corner of Lake Tashk. These mountains are high enough (Kuh-e Dinar at 4432m and 30°50'N, 51°35'E) to have a snow cover and thus there is a continuous flow throughout the year. However, in summer water does not reach the lake because of the demands of irrigation. Drainage and irrigation canals run through the basin on the plains at the north end of the lake. Several springs feed marshes, notably the Lapu'i marshes, a wetland of 150km² to the north-west of the Kor-Pulvar junction, the Zarqan marshes of 4km², an

extension of the Lapu'i marsh (both now severely damaged by construction of a drainage canal as part of the Dorudzan or Sadd-e Daryush-e Kabir (dam) at 30°15'N, 52°20'E, a project on the Kor River), the Gumoon or Sangare marshes of 2km² at the north-west corner of Lake Tashk and the Sahlabad marshes of 5km² on the south-east coast of Lake Bakhtegan (Cornwallis 1968a, 1968b). The Band-e Amir or Kamjan Marshes at 29°40'N, 53°05'E are formed at the delta of the Kor River and encompassed about 100km² but the Daryush-e Kabir Dam severely restricts the water flow to these marshes. A dam on the Bolaghi Gorge is proposed which would affect the flow of the Pulvar but is being opposed on archaeological grounds (www.netiran.com, downloaded 4 October 2004). The Neyriz Lakes and Kamjan Marshes are a Ramsar Site (World Conservation Monitoring Centre, 1990). The Ghadamghah spring-stream system at 30°15'N, 52°25'E and 1660m altitude has been described by Esmaili et al. (2007) and is a regional hotspot for biodiversity. Kaftar Lake at 30°34'N, 52°47'E is at ca. 2300m in the Zagros Mountains northeast of Shiraz. The Kor River basin also contains qanats. Some of these flank the Pulvar River, for example, and serve to bring water to fields above the incised river bed.

8) Lake Maharlu. The Maharlu basin is the valley of Shiraz (29°36'N, 52°32'E) and encompasses about 4100km². Lake Maharlu is at an altitude of about 1460 m, has an estimated average area of 220km², a maximum depth variously cited as 0.5 and 3m, a salinity of 124‰ or 304.95g/l and is fishless. The lake dried out completely in 1967 (Cornwallis 1968a). The lake is fed by minor streams and springs around its margin. The Khoshk River flowing through Shiraz is dry for much of the year or composed mostly of polluted wastes from businesses, domestic sources, industry and agriculture (Kafilzadeh et al. 2007). The basin also has a number of qanats. Stream temperatures vary between 8°C in January to 32°C in June while qanats can be warm, e.g. at Sarvestan (29°16'N, 53°13'E) in December a

qanat was 25°C. Surber (1969) gives some spot data on pH, total alkalinity, calcium-magnesium hardness, chlorides and free CO₂ in this area. The basin is separated by only a small rise from the Mond River of the Persis sub-basin, but is treated separately here because fish collections have been focused on this valley as Shiraz is the major city of southern Iran. Major fresh to brackish springs and their associated marshes (Ab-e Paravan (2.5km²), Barm-e Shur (1.5km²) and Soltanabad (7km²)) are concentrated at the northern end of the lake (Cornwallis 1968a). Larger springs have pools which are about 2m deep and reed beds of *Phragmites* and *Typha*, some of which are cut. Livestock grazing occurs. Amphibious tanks were tested in Barm-e Shur, stirring up anoxic bottom mud and leading to a fish kill.

9) Lake Urmia. Lake Urmia (= Reza'iyeh, Urmi, Urumiyeh, Orumiyeh) lies in north-west Iran and is the only Iranian lake large enough to appear on general maps of the world. This lake is a Ramsar Site and includes Urmia National Park. Brackish marshes in the northeast, northwest and southern shores probably support some fishes but the lake itself is too salty. Urmia lies at about 1275-1300m (accounts vary), is about 128-149km long and 40-60km wide. This thalassohaline lake has a surface area of 4750-6100km², a volume of 29.4km³, a mean depth of 4.9-6.0m, a maximum depth of 16m, and a temperature range of -1.3-27.5°C. Lake level can rise as much as 2 m in one season, as it did in the winter of 1968-1969. It is a sodium chloride-sulphate system with a salinity up to 340.0g/l (but mostly 217-235g/l) and consequently is fishless. Initially the lake was probably fresh (Admiralty Naval Staff 1918). A causeway has divided the lake into two parts since 1989; a gap allows a limited exchange between the two parts. Its drainage basin approaches 57,000km² (or 51,786km², authors differ) and the lake is the terminal basin for a number of streams and rivers. Annual inflow is 6.9 Billions m³ (Ghaheri et al. 1999). During spring runoff a freshwater plume covers large areas over the saline lake near river

mouths. Prominent perennial streams include the Zarrineh River (230km long) entering from the south and draining part of the northern Zagros with a range in discharge of 10-510m³ per second with the Tata'u or Simineh River (145km) as a major tributary, the saline Aji Chay or Talkheh (= bitter) River from the east draining the flanks of Kuhha-ye Sabalan at 4810m (38°15'N, 47°49'E) and Kuh-e Sahand at 3710m (37°44'N, 46°27'E), and the smaller streams from the west such as the Zowla (= Zola) Chay (84 km), Nazlu Chay (85km), Shahr (= Shaher) Chay (70km), Baranduz Chay (70 km) and Gadar (= Qader) Chay (100 km) (Günther, 1899). Both the Zarrineh and the Talkheh exceed 200km in length. The Talkheh River has a hardness of 820mg/l according to Surber (1969), who also gives values of total alkalinity and calcium-magnesium hardness for a number of streams and lakes around Tabriz. The Talkheh floods extensively in the spring and forms large marshes. Most streams were relatively hard like the Talkheh although some were soft such as the Basmenj Chay draining Kuh-e Sahand at 70mg/l. Qanats are found in this basin where surface water is saline.

10) Namak Lake. This basin is flanked by the Alborz Mountains to the north and the Zagros Mountains to the west. On the east is the vast expanse of the Dasht-e Kavir basin and on the south such ranges as the Kuh-e Karkas at 3899 m (33°27'N, 51°48'E). The basin encloses about 87,600km². The principal river in the west draining the Alborz south towards the Namak Lake is the Karaj River. The Abhar River and its tributaries drain the land west of Tehran and south of Qazvin (36°16'N, 50°00'E). Its headwaters approach those of the Zanjan River, a Caspian Sea tributary. The course of the Abhar is about 350km from its headwaters to the terminal sump. The lower part of this river is known as the Shur and is salty. Other rivers draining the Alborz are much shorter. The Jajrud (Jaj, Jaji or Jaje River) to the east of Tehran is dammed at Latian. The Khan River flows from the Khasrang Mountain (as does the Jajrud which it receives) and its branches on the

Varamin Plain are used for irrigation. The Namak Lake receives the Qareh Su (Gharechay), which flows north of Qom, and the Qom River from the Zagros Mountains.

11) Sirjan. The Sirjan basin extends south-east of the Esfahan basin and parallels the Kerman-Na'in basin. It is named for the town of Sirjan at 29°28'N, 55°42'E which lies at the edge of the largest salt flat in the basin. It is somewhat higher than the Esfahan basin (1300m), being 1448-1710 m. It is distinguished from the Esfahan basin by its lack of a significant river. There are four major sumps in this basin, strung out along its length at regular intervals, and the northern two are connected as are the southern two. The sumps are fed by intermittent streams. Qanats and minor springs are found in this basin which has not been extensively explored. The sump in the north near Abarqu (31°08'N, 53°17'E) receives streams from the west (Kuh-e Bul at 3661m and 30°48'N, 52°45'E) and from the east (Khar Kuh at 3512m and 31°39'N, 53°46'E, and Shir Kuh at 4074m and 31°37'N, 54°04'E). The southern basins near Sirjan receive their streams from lower elevations.

12) Sistan. The Sistan (= Seistan) basin straddles the Iran-Afghanistan border and is a north-west to south-east oval in shape. It comprises a number of minor streams and qanats flowing from the west and the Birjand highlands, but these are rapidly absorbed or run for only a few days each year. Its most obvious feature is the vast *hamun* or swamp comprising open freshwater lakes, reed beds or *neizar*, and the rivers that feed the lakes. The principal river is the Helmand (or Hirmand) which flows from the Paghman Mountains just west of Kabul to end in Sistan after a journey of 1400 km. Along with the Hari or Tedzhen, this is the only major river entering Iran. Snow and rain in the Hindu Kush mountains ultimately reaches Sistan at 427m from heights of 5300. The Helmand is the most important river between the Tigris and the Indus and drains an area of 386,000km² of which 78,000km² or 20.2% lies in Iran (Gleick 1993).

13) Hari (Tedzhen) River. The Tedzhen River

is the international name. In Iran this major river is known as the Harirud or Hari River. The Hari rises in the Selseleh-ye Kuh-e Baba of Afghanistan and flows west for about 490km before turning north as the Iran-Afghanistan border for 160 km. Along with the Hirmand and Aras, this is the only major river entering Iran. At Sarakhs (36°32'N, 61°11'E) it enters Turkmenistan and is known there as the Tedzhen, and is eventually lost in the Karakum desert. The river is usually dry even at Sarakhs (Barthold 1984). Most of the water in the Hari remains in Afghanistan where it is used for irrigation of the Herat valley. Spring floods (March-April) can increase flow ten-fold for short periods of time. The Jam River is a southern tributary from Iran, draining the mountains around Torbat-e Jam (35°14'N, 60°36'E) and the Kashaf River is a northern Iranian tributary draining past Mashhad from the northern slopes of the Kuh-e Binalud (3416m at 36°30'N, 58°55'E) and the southern slopes of the Kuh-e Hazar Masjed (3146m at 36°52'N, 59°26'E). The Kashaf is about 310km long. Its discharge is comparable to, if not as great as, central Zagros streams and is larger than the plethora of minor streams draining the Alborz (Oberlander 1968b). The upper reaches of the Kashaf approach those of the Atrak River, a Caspian Sea tributary, and are separated by only a small upfold. This area is very unstable with frequent earthquakes. The catchment area for the Hari basin approaches 45,000km² (Pirnia 1951). Bazangan Lake between Mashhad and Serakhs (36°17'N, 60°29'E) is the largest natural lake in northeast Iran with an area of 690,000m² and a maximum depth of 6-11 m. It is hyposaline oligotrophic with low phyto- and zooplankton communities, and with a corresponding low diversity of fishes (Ghassemzadeh 2004).

14) Kerman-Na'in. The Kerman-Na'in basin extends from Ardestan (33°22'N, 52°23'E) in the north-west to Kerman (30°17'N, 57°05'E) in the south-east. It is an elongate series of small basins combined here for convenience and named for two major towns at the ends of the

basin. Its length exceeds 600km and its maximum width is 175 km. An almost continuous range of mountains, paralleling the Zagros, flanks this basin on the west, while the eastern edge is lower and abuts the Dasht-e Kavir and Dasht-e Lut basins, particularly in the north-east. The Kerman-Na'in basin lies at a similar altitude to the other interior basins, ca. 1000 m. In the south-east, streams drain the mountains ringing Kerman, such as the Kuh-e Hazaran at 4420m (29°30'N, 57°18'E), the Kuhpayeh at 3142m (30°35'N, 57°15'E), and the Kuh-e Masahim at 3600m (30°21'N, 55°20'E), to a sump just west of Bafq (31°35'N, 55°24'E). These streams bear names such as Namak and Shur and may well be inhospitable to fishes. Several streams between Kerman and Yazd marked prominently on maps were dry in January. Irrigation requirements may have reduced their flow and most of the fishes from this area are to be found in qanats.

Exorheic basins. The exorheic basins of Iran are divided into two large basins, the Makran and Persian Gulf.

15) Makran basin. The Makran is the coastal region of southeastern Iran between the Straits of Hormuz and the Pakistan border that drains to Oman Sea. In the west of this region the relief runs in a north-south direction parallel to the coast but from Jask eastwards the relief runs west-east, again paralleling the coast, to the Pakistan border. The rivers and streams of the Makran all drain to the sea at the Straits of Hormuz and the Sea of Oman. The inland Hamun-e Jaz Murian basin is isolated by mountain ranges reaching peaks in excess of 2000m. The coastal drainages are often incised and the larger watercourses pass through tangs over 1000m deep (Harrison 1968). Descriptions of the watercourses between Jask and the upper Geh (= Nikshahr, Kaeyr or Kalar) River drainage (mouth is at 25°37'N, 60°08'E) by Harrison (1941) indicate they are similar to other areas of Makran. It seems probable that only the Minab and Sarbaz Rivers have, or nearly have, a perennial and continuous flow

along most of their course. Even these rivers are quite shallow and the Sarbaz in particular is easily fordable on foot along its entire length (ca. 280km). The Minab River flows over a shorter course (ca. 220 km) than the Sarbaz, but has a greater flow regime. At Minab (27°09'N, 57°05'E) and at Rudan (27°26'N, 57°12'E) the Minab River was up to 100m wide with an estimated maximum depth in pools of 2-3m. The lower Sarbaz River was a series of shallow, muddy pools in the bottom of a canyon with some water flowing over sills connecting the pools (in early December 1977). The lower Sarbaz has been designated a Wetland of International Importance. In its middle and upper course the Sarbaz varied from a very shallow and narrow stream connecting pools (some of which were fishless) to what must be termed a river in the semi-desert environment of Baluchestan, with a width of 10m, a depth of about 1m and fast current. The rockfill embankment Pishin Dam built over the rivers Pishin and Sarbaz is 63m high, has a crest length of 400m and can store 175 million m³ of flood waters (<http://netiran.com/news/IRNA/html/930418IRGG10.html>). The other streams of the Makran have little running water, often become isolated pools a kilometre or more apart, and regularly dry up along much of their length. Several rivers between the Mazavi (= Geru) River (mouth is at 26°56'N, 56°56'E) and the port of Jask are named and marked prominently on maps, but these were all dry in their lower reaches in late November 1976 for example. Some flow in their upper reaches is to be expected, but its extent will depend on topography and climatic conditions.

16) Persian Gulf basin. This basin is subdivided to four sub-basins:

A) Hormuz (Hormuzgan) sub-basin. The Hormuz (or Hormozgan) sub-basin comprises a number of intermittent streams and rivers which drain to the Straits of Hormuz. The sub-basin has a catchment of 55,800km². Rainfall is low and sporadic at this southern end of the Zagros Mountains and streams are not always perennial. Qanats are an important feature and

there is a hot spring (41°C) at Genu (27°26'N, 56°20'E) just north of Bandar-e Abbas. This area of Iran is rich in salt domes rising to over 1200m above the surrounding land surface and consequently surface water is often contaminated and stream banks are rimed with salt. Some of the islands off this coast are salt plugs, e.g. Hormuz Island. Temperatures in winter are high in the lower streams, 15-33°C, and must be much higher in summer. These warm and saline streams are home to the endemic cichlid, *Iranocichla hormuzensis*, and so are distinguished from the freshwaters to the north, east and west. This species has been collected in the Minab River where collections in the 1970s did not find it. The Minab River was included in the Makran basin but may well form the easternmost part of this basin. The principal river is the Kul with its tributary the Shur (= salt) River. The upper reaches of the Shur lie west of Darab (28°45'N, 54°34'E) and mountains here exceed 3000 m. The headwaters of the Shur approach those of the eastern tributaries of the Mond River basin. The lower valleys parallel the coast and drain eastwards. The Rasul River is a tributary of the Kul, while the Mehran River drains directly into the sea. Several islands in the Persian Gulf are included as part of this basin. The largest island is Qeshm but it lacks rivers although there are some small dams to collect rainwater runoff. Species observed are *Aphanius dispar*, a mudskipper and the introduced *Gambusia holbrooki*. Water temperatures reach 32°C.

B) Persis sub-basin. Persis is an ancient name for the region. This sub-basin comprises rivers which drain the southern Zagros Mountains to the head of the Persian Gulf, but which are not now tributaries of the Tigris River nor are they the salt streams of Hormuz. The major rivers are the Helleh, which debouches into the Persian Gulf north of Bushehr (28°59'N, 50°50'E) and the Mand or Qarah Aqaj (= the classical Sitakos), which, with its tributaries, drains much of Fars Province to the Persian Gulf south of Bushehr. Near Shiraz it is known as the Qarah Aqaj or Kavar River. The Band-e

Bahman, a weir or small dam on this river near Kavar, is probably pre-Islamic.

C) Tigris sub-basin. The Tigris-Euphrates basin is the largest and most important river system between the Nile and the Indus. Details of its biology can be found in Rzóška (1980) but comparatively little was based historically on the Iranian part of this basin although Nümann (1966) gave some limited data on chemical and physical parameters. Por & Dimentman (1989) regard the Tigris-Euphrates or Mesopotamian basin as a cradle for inland aquatic faunas. A proto-Euphrates collected water from the Levant and had contacts with the Black and Caspian Sea drainages before the Pliocene orogeny. Berg (1940) points out that the upper reaches of the Tigris-Euphrates basin today lie on a plateau close to the upper reaches of the Caspian Sea basin. The basin acted as an area where African and Asian species could meet or transit such as the cichlid *Iranocichla*. These connections were interrupted in the early Pliocene by orogeny, rifting and desert formation. Banarescu (1977) and Por & Dimentman (1989) regard the area to be a zoogeographic crossroads with elements from the Palaeartic such as the cyprinid genera *Leuciscus* (= *Squalius*) and *Chondrostoma*, Mediterranean genera such as the cyprinid *Acanthobrama* (although Krupp (1987) refers to this genus as Palaeartic, of Mesopotamian origin), and Oriental genera such as the cyprinid *Garra* and the spiny eel *Mastacembelus*. Al-Rudainy (2008) and Coad (2010) are recent accounts of the fishes in Iraq. The Zagros Mountains form the western flank of Iran and store water as snow. The higher peaks are snow-capped even in summer. Zard Kuh, for example, reaches 4548m (32°22'N, 50°04'E). Rivers drain south and west to become tributaries of the Tigris River in Iraq or its confluence with the Euphrates River, the Arvand (= swift) Rud in Iran (known as the Shatt al Arab in Iraq). The Arvand River has a course of 190km to the head of the Persian Gulf and is navigable by ocean-going ships. It forms part of the Iran-Iraq border. The origin of the

Tigris River is the Hazar Gölü of Elazig (38°41'N, 39°14'E) between the Murat Nehri and the Euphrates. It flows south-east, forming a short section of the border of Syria with Turkey, before entering Iraq to parallel, roughly, the course of the Euphrates River. It is a larger and swifter river than the Euphrates because of its left bank tributaries from Iran. The Tigris is over 1900km long (1851km and 2032km are extremes cited in the literature). It is the 81st river in size in the world. The Tigris-Euphrates basin encompasses 784,500km² of which 19% or 146,000km² lies in Iran. Gleick (1993) gives 238,500km² and 27% for Iran and 884,000km² for the whole basin; the Iraqi Government in the same publication gives 378,834km² for the Tigris basin alone with Iran's share 28.8%). Iran contributes 7% of the water supply of this immense basin. The Tigris catchment is 166,155km². The principal Iranian tributaries of the Tigris River are the Little Zab River (= Zab-e Kuchek) which drains a small stretch of mountains south of Lake Urmia, and the Diyala River (= Sirvan River) which drains the western mountains of Kordestan. The Diyala River is 442km long. A principal tributary of the Diyala in Iran is the Qeshlaq River which flows through Sanandaj (35°19'N, 47°00'E). A number of minor streams also cross the Iran-Iraq border, but the principal rivers drain through anticlines in spectacular gorges or tangs, funnelling the waters of the Zagros onto the Khuzestan plains through a narrow gap near Dezful (32°23'N, 48°24'E). The main river is the Karun, with a catchment of 67,340km² (Naff and Matson, 1984) and a length of 820 km. It now drains to the Shatt al Arab but once drained directly into the Persian Gulf. The Karun is also connected to the Persian Gulf via the Bahmanshir River, paralleling the Arvand River, and enclosing Abadan Island. The Bahmanshir is the only river along the Persian Gulf coast to have a significant fishery. The Karun headwaters are extensive and lie near both the Esfahan and Kor River basins. The Dez River is a Karun tributary and is 400km long. The Karkheh River (with the Cherdavel,

Kashkan, Qareh Su, Gav Masiab and Simareh in its upper reaches) is 320km long, but is lost in the Hawr-al-Azim marshes of the Tigris after draining 43,000km². Sutcliffe & Carpenter (1967) described runoff from the Karkheh basin. The Karkheh and Dez flows were depleted by 70% in 2001 during a drought and it was thought that these rivers might dry completely (Foltz 2002). The marshes along the Karkheh and Dez rivers, with oxbow lakes and riverine forest, are a habitat now rare in southern Iran and Iraq outside protected areas. The Jarrahi River is a southern Karun tributary from the east. The Marun River is a major Jarrahi tributary. The Marun and Jarrahi feed the Shadegan Marshes, the largest Iranian wetland according to Kurdistani & Bajestan (2004).

D) Zohreh sub-basin. At its northern edge, the Zohreh River flows across the Khuzestan plains and is close to Tigris River tributaries. Shesh Peer, Fahlian and Kheir Abad are the main tributaries of the Zohreh sub-basin.

Results

The total confirmed and recently not confirmed species of freshwater fishes of Iran comprise 288 species in 107 genera, 28 families, 22 orders and 3 classes reported from different Iranian basins (Figs. 5, 6). However, presence of 23 reported species in Iranian waters needs confirmation by specimens. The most diverse order is the Cypriniformes with 171 species (59.40%), followed by Gobiiformes with 42 species (14.60%), Cyprinodontiformes (17 species, 5.90%), Clupeiformes (11 species, 3.82%), Salmoniformes (7 species, 2.43%), Acipenseriformes, Siluriformes, Mugiliformes and Cichliformes each with 6 species (2.08%), Perciformes (3 species, 1.04%), Scorpaeniformes (2 species, 0.69%) and 11 other orders each with one species (0.35%). Also, for the first time we report a single specimen of the Alligator gar, *Atractosteus spatula* (Lepisosteiformes, Lepisosteidae), as an introduced predatory fish from a natural water body (Marivan Lake, Tigris River tributary) of

Iran which seems to have been released by local people from an aquarium. This exotic fish was not included in total analysis and its further presence should be confirmed. Moreover, two new described species, *Oxynoemacheilus gyndes* and *O. hanae*, from upper reaches of the Sirvan River, Iraq, might be present in the Iranian part of this river.

Number of fish species in different families is given in Fig. 6. The most diverse family is Cyprinidae with 119 reported species (41.31%) followed by Nemacheilidae with 45 species (15.62%), Gobiidae (42 reported species, 14.6%), Cyprinodontidae (14, reported species, 4.87%), Clupeidae (11 reported species, 3.82%), Cobitidae and Salmonidae (each with 7 reported species, 2.43%), Acipenseridae, Cichlidae and Mugilidae (each with 6 reported species, 2.08%), Percidae and Poeciliidae (each with 3 reported species, 1.04%) and

Gasterosteidae, Siluridae and Sisoridae (each with 2 reported species, 0.69%). Thirteen families have 1 reported species (0.35% each). Iran comprises 88 endemic species (30.56% of total reported species) in 7 families (Fig. 7): Cyprinidae (41, 46.6%), Nemacheilidae (27, 30.7%), Cyprinodontidae (11, 12.5%), Cichlidae (3, 3.41%), Cobitidae (4, 4.55%), Gobiidae (1, 1.14%) and Sisoridae 1 (1, 1.14%). However, it is expected that the number of endemic fishes to be increased as new species are being described. Out of 288 reported species, 23 species require confirmation of their occurrence in Iran. Gobiidae with 18 unconfirmed species (78.26%) is ranked first followed by Clupeidae with two species (8.69%) and Acipenseridae, Cyprinidae and Nemacheilidae, each with only one species (each with 4.35%).

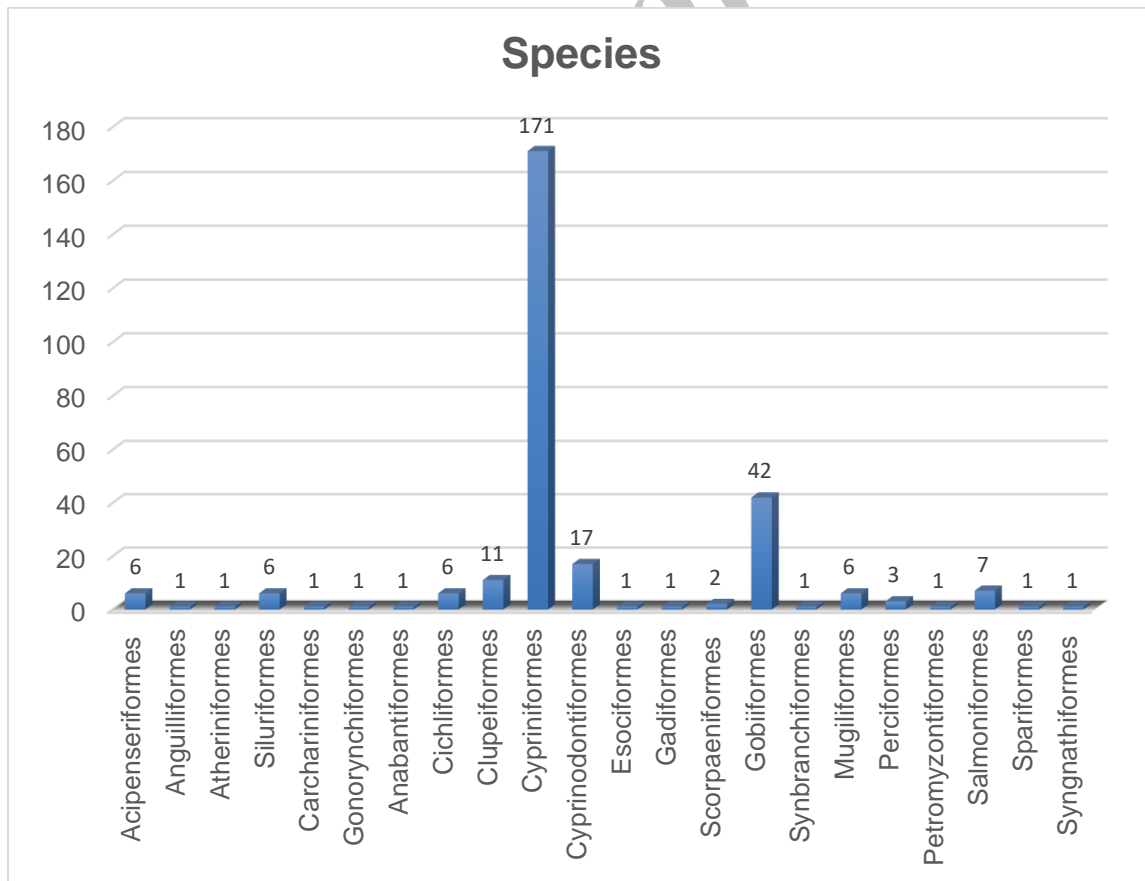


Fig. 5. Number of fish species in different fish orders.

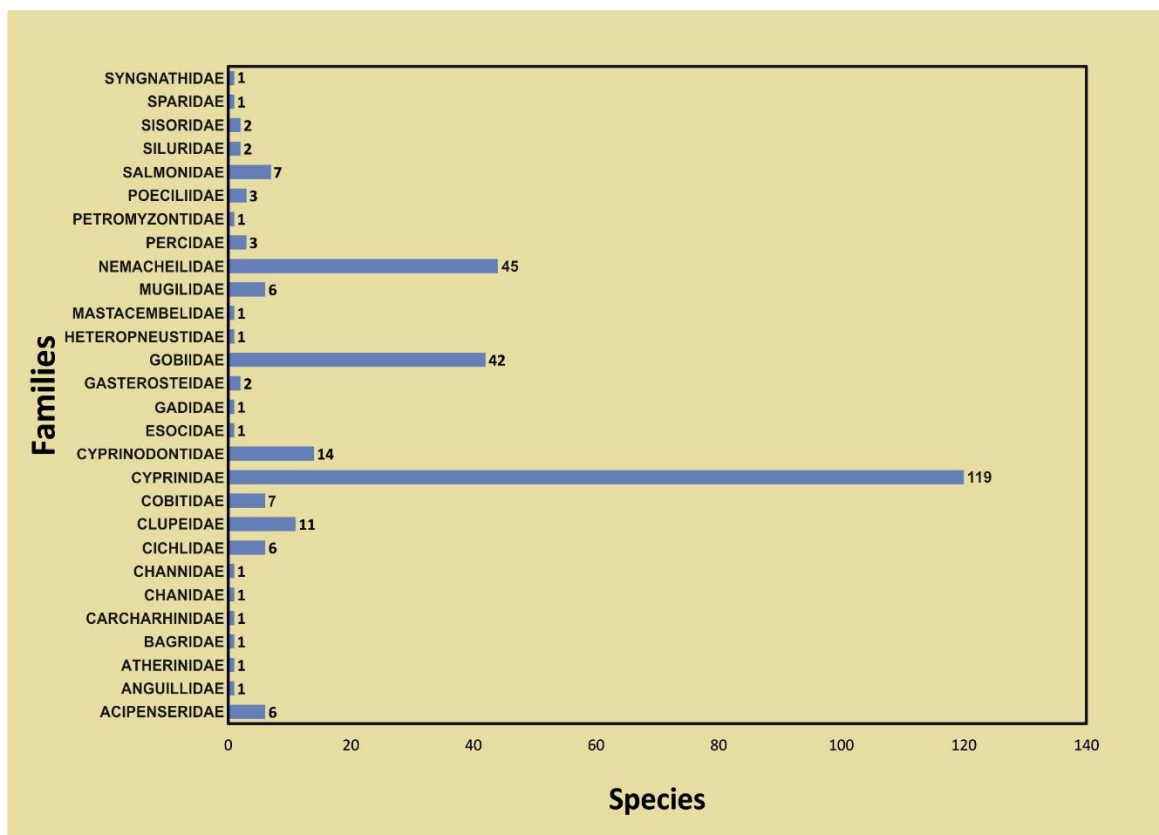


Fig. 6. Number of fish species in different families.

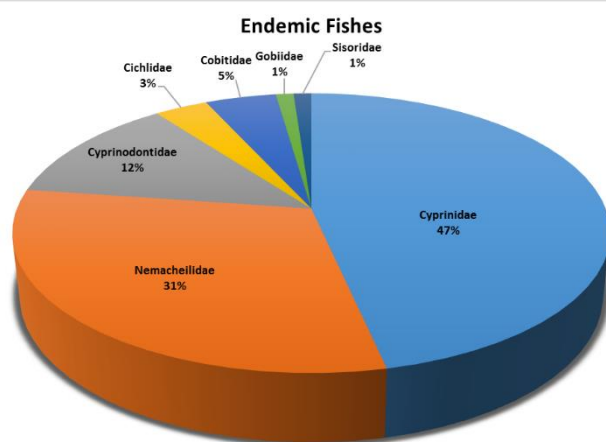


Fig. 7. Number of endemic fishes of Iran in different families.

Twenty-six exotic species in nine families are listed from Iranian basins (Fig. 8). Cyprinidae with 10 species (38.46% of the total exotic species) is ranked first followed by the Salmonidae with 4 species (15.38%), Cichlidae and Poeciliidae (each with 3 species, 12%),

Mugilidae (2 species, 7.7%), and four families (Anguillidae, Gasterosteidae, Gobiidae, Heteropneustidae) each with only one species or 3.8%. However, there are reports of some other exotic and transplanted species (Coad 1995), which have not been recently collected and cannot be confirmed to be present in Iran. Some species have been established, such as *Carassius auratus*, *C. gibelio*, *Hemiculter leucisculus*, *Pseudorasbora parva*, *Chelon auratus*, *Chelon saliens*, *Gambusia holbrooki* and *Gasterosteus aculeatus*. Some species are questionably established but numerous in the basin due to stocking, such as *Hypophthalmichthys nobilis*, *Hypophthalmichthys molitrix*, *Ctenopharyngodon idella*. Schematic drawings and live photos and of some native and exotic fishes and their habitats in the Iranian basins are given in Figs. 9-41.

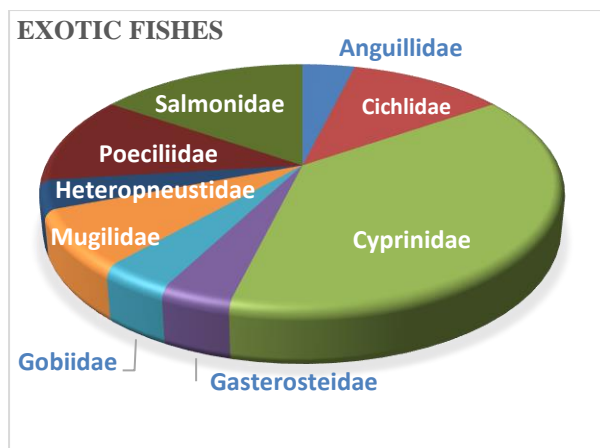


Fig. 8. Number of exotic fishes of Iran in different families.

We expect more species to be described as new, resurrected from synonymy, recorded for the first time from Iran, or recorded as established introductions. Hence, the fish fauna could exceed those recorded in this checklist. The listing includes selected taxonomic comments including synonyms where these have been used in recent literature. Older synonyms can be found in Coad (1995).

CHECKLIST

*= endemic to Iran, **= exotic. Unconfirmed species are those mentioned in the literature but without confirmatory specimens in a museum. They are included in the totals in the checklist.

CLASS PETROMYZONTIDA

Order Petromyzontiformes (1 family, 1 genus and 1 species)

Family Petromyzontidae (1 genus and 1 species)

Genus *Caspiomyzon* Berg, 1906

Caspiomyzon Berg [L.S.] 1906:173. Masc. *Petromyzon wagneri* Kessler, 1870. Type by monotypy.

Etymology: *Caspiomyzon*: Composed from Caspian Sea+Greek, myzo= to suckle.

1. *Caspiomyzon wagneri* (Kessler, 1870)

Petromyzon wagneri Kessler [K.F.] 1870:207, Pl. 3 (figs. 4-5) [Trudy St.-Peterburgskogo Obscestva Estestvoispytatelej= Travaux de la Société des

Naturalistes de St. Pétersbourg. v. 1].

EN: Caspian lamprey (Fig. 10).

Type locality: Volga River between Tver [Tvertsa] and Astrakhan, 46°21'N, 48°03'E, Russia.

Distribution: Caspian Sea basin.

IUCN: Near Threatened.

Comments: Berg (1931) suggested that this species consists of two races; a normal form (forma typica) and a smaller praecox form (Renaud 2011).

CLASS CHONDRICHTHYES

Order Carcharhiniformes (1 family, 1 genus and 1 species)

Family Carcharhinidae (1 genus and 1 species)

Genus *Carcharhinus* Blainville, 1816 (1 species)

Carcharhinus (subgenus of *Squalus*) Blainville [H. de] 1816:121. Masc. *Carcharias melanopterus* Quoy & Gaimard, 1824. Genus placed on Official List (Opinion 723).

Etymology: *Carcharhinus*: Greek, karcharos = sharpen + Greek, rhinos = nose.

2. *Carcharhinus leucas* (Müller & Henle, 1839): 42 [Systematische Beschreibung der Plagiostomen].

EN: Bull shark (Fig. 11).

Type locality: Antilles, western Atlantic.

Distribution: Tigris.

IUCN: Near Threatened.

CLASS ACTINOPTERYGII

Order Acipenseriformes (1 family, 2 genera and 6 species, 1 unconfirmed)

Family Acipenseridae (2 genera and 6 species, 1 unconfirmed).

Genus *Acipenser* Linnaeus, 1758.

Acipenser Linnaeus [C.] 1758:237. Masc. *Acipenser sturio* Linnaeus, 1758. Type by Linnaean tautonymy. Spelled *Accipenser* by authors.

Etymology: *Acipenser*: Latin, acipenser= sturgeon.

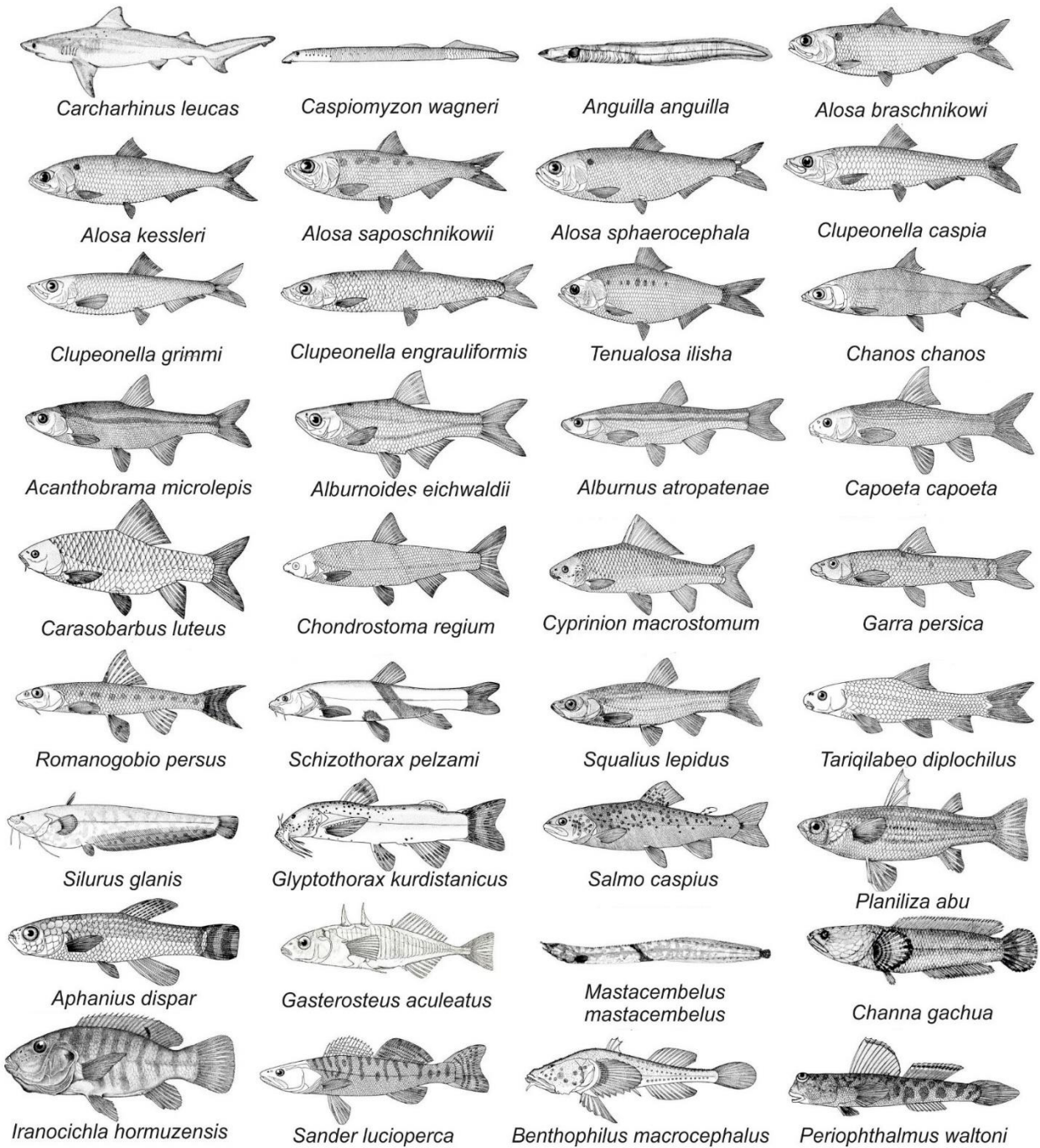


Fig. 9. Schematic pictures of some freshwater fishes of Iran.



Fig. 10. *Caspiomyzon wagneri*, Caspian Sea basin (K. Abbasi).



Fig. 11. *Carcharhinus leucas*, courtesy of J.E. Randall.

Comment: *Acipenser baerii* Brandt, 1869 has been recently used in some fish farms and research centers.

3. *Acipenser gueldenstaedtii* Brandt & Ratzeburg, 1833

Acipenser gueldenstaedtii Brandt [J. F.] & Ratzeburg [J.T.C.] 1833:13, Pl. 3 (figs. 2, 2A-E) [Medizinische Zoologie v. 2].

EN: Russian sturgeon.

Type locality: Caspian Sea and tributaries; Black Sea. No types known.

Distribution: Caspian Sea basin.

IUCN: Critically Endangered.

4. *Acipenser nudiiventris* Lovetzky, 1828

Acipenser nudiiventris Lovetsky [A.] 1828:78, Pl. 6 (fig. 2) [Novyi Magazin, Estestvennoi Istorii, Fiziki, Khimii i Svedenii i Svedenii Ekologicheskikh, Izdannyi 1. Dviubskim Part 2].

EN: Ship.

5. *Acipenser persicus* Borodin, 1897

Acipenser persicus Borodin [N. A.] 1897:18, figs. [Vestnik Rybopromyshlennosti St. Petersburg v. 12].

EN: Persian sturgeon.

Type locality: Ural River to Ural'sk, Kazakhstan; Kura River, Azerbaijan; southern shore of Caspian Sea, Iran.

Distribution: Caspian Sea basin.

IUCN: Critically Endangered.

6. *Acipenser ruthenus* Linnaeus, 1758

Acipenser ruthenus Linnaeus [C.] 1758:237 [Systema Naturae, Ed. X v. 1].

EN: Sterlet.

Type locality: Danube River. Holotype: NRM 96.

Distribution: Caspian Sea basin.

IUCN: Vulnerable.

Comment: Reported from the middle and South Caspian Sea by Naseka & Bogutskaya (2009) but not confirmed by specimens for Iran.

7. *Acipenser stellatus* Pallas, 1771

Acipenser stellatus Pallas [P. S.] 1771:460 [Reise durch verschiedene Provinzen des russischen Reiches].

EN: Stellate sturgeon (Fig. 12).

Type locality: Volga River at Simbirsk, Caspian Sea, Ural River to Gwje. No types known.

Distribution: Caspian Sea basin.

IUCN: Critically Endangered.

Genus *Huso* Brandt & Ratzeburg, 1833 (1 species)

Huso Brandt [J.F.] & Ratzeburg [J.T.C.] 1833:3, 349. Masc. *Acipenser huso* Linnaeus, 1758. Type by absolute tautonymy.

Etymology: *Huso*: Latin, huso = swine.

8. *Huso huso* (Linnaeus, 1758)

Acipenser huso Linnaeus [C.] 1758:238 [Systema Naturae, Ed. X v. 1].



Fig. 12. *Acipenser stellatus*, Caspian Sea basin (K. Abbasi).

EN: Beluga /bə'lu:gə/ or European sturgeon (Figs. 13, 14).

Type locality: Danube and the rivers of Russia. No types known.

Distribution: Caspian Sea basin.

IUCN: Critically Endangered.

Comment: *Huso huso caspicus* Babushkin [N. Ya.] 1942:131 [Izvestiia Azerbaidzhankoi nauchno-issledovatel'skpi rybokhoziaistvennoi stantsii. Baku, Russia. No. 7] from Caspian Sea has been considered as a subspecies. No types known.



Fig. 13. *Huso huso*, Caspian Sea basin (K. Abbasi).



Fig. 14. A female *Huso huso* (about 600kg) captured on April 2, 2017 from the Caspian Sea.

Order Anguilliformes (1 family, 1 genus and 1 species)

Family Anguillidae (1 genus and 1 species)

Genus *Anguilla* Schrank, 1798 (1 species)

Anguilla Schrank [F. von P.] 1798:304, 307. Fem. *Muraena anguilla* Linnaeus, 1758. Type by monotypy. Kottelat 2013:37 dates to *Anguilla* Garsault 1764, Pl. 661 with no species;

Etymology: *Anguilla*: Latin, anguilla, -ae = eel.

9. *Anguilla anguilla* (Linnaeus, 1758)**

Muraena anguilla Linnaeus [C.] 1758:245 [Systema Naturae, Ed. X v. 1].

EN: European eel.

Type locality: Europe, Mediterranean Sea, Baltic Sea, northeastern Atlantic [original: "in Europa; maxima in lacu Cornachio Ferrariensi"]. No types known.

Distribution: Introduced to the Caspian Sea basin.

IUCN: Critically Endangered.

Order Clupeiformes (1 family, 3 genera and 11 species, 2 unconfirmed)

Family Clupeidae (3 genera and 11 species, 2 unconfirmed)

Genus *Alosa* Linck, 1790

Etymology: *Alosa*: Latin, alausa = a fish cited by Ausonius and Latin, halec = pickle, dealing with the Greek word hals = salt; it is also the old Saxon name for shad = "alli".

Alosa Linck [H. F.] 1790:35. Fem. *Clupea alosa* Linnaeus, 1758. Type apparently by

subsequent absolute tautonymy. Type apparently by subsequent absolute tautonymy; no species initially mentioned, species added by Cuvier 1829:319.

Comment: The Caspian species of *Alosa* were formerly placed in the genus *Caspialosa* Berg, 1915. Svetovidov (1952) synonymised the genus *Caspialosa* Berg, 1915 with *Alosa*. Many subspecies have been described for some species in the Caspian Sea but their status has not been assessed recently.

10. *Alosa braschnikowi* (Borodin, 1904)

Clupea caspiopontica braschnikowi var. Borodin [N. A.] 1904:180 [13], fig. 4 [Vestnik Rybopromyshlennosti St. Petersburg v. 19 (no. 3)].

EN: Caspian marine shad or Brazhnikov's shad (Fig. 15).

Type locality: Near Fort Aleksandrovsk, middle Caspian Sea, Kazakhstan.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

11. *Alosa caspia* (Eichwald, 1838)

Clupea caspia Eichwald [C.E. von] 1838:134 [Bulletin de la Société Impériale des Naturalistes de Moscou v. 11].

EN: Caspian shad (Fig. 16).

Type locality: Caspian Sea.

Distribution: Caspian Sea basin.

IUCN: Least Concern.



Fig. 15. *Alosa braschnikowi*, Caspian Sea (K. Abbasi).



Fig. 16. *Alosa caspia*, Caspian Sea (K. Abbasi).

12. *Alosa curensis* (Suvorov, 1907)

Clupea (Alosa) kurensis Suvorov [E. K.] 1907:162 [24], fig. 4 [Trudy Kasp. Exped. 1904 v. 1].

EN: Kura shad.

Type locality: Southern Caspian Sea, near mouth of Kura River, Azerbaijan.

Caspian Sea basin.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

Comment: Reported from the middle and southern Caspian Sea by Naseka & Bogutskaya (2009) but not confirmed by specimens for Iran.

13. *Alosa kessleri* (Grimm, 1887)

Clupea kessleri Grimm [O. von] 1887:7, 16 [Sel'skoe khozyaistvo i lesovodstvo 1887 (no. 2)].

EN: Caspian anadromous shad, blackback, or the black-spined herring.

Type locality: Volga River delta, Astrakhan

(Fig. 17).

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Comment: Formerly placed in *A. pontica* (Eichwald, 1838) as a subspecies but Kottelat & Freyhof (2007), Abdoli & Naderi (2009) and Naseka & Bogutskaya (2009) consider *Alosa kessleri* as a valid species.

14. *Alosa saposchnikowii* (Grimm, 1887)

Alosa saposchnikowii Grimm [O. von] 1885:2 [Astrakhanskii Spravochnyi Listok. v. 99 (5 May)].

EN: Saposhnikov shad (Fig. 18).

Type locality: Delta of the Volga River [45.85°N, 47.57°E], Russia.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

Comment: The name is often spelt *saposchnikovi*, in error, or with a single terminal "i"; Reshetnikov et al. (1997) revert to the original spelling of the specific name.



Fig. 17. *Alosa kessleri*, Caspian Sea (K. Abbasi).



Fig. 18. *Alosa saposchnikowii*, Caspian Sea (K. Abbasi).

15. *Alosa sphaerocephala* (Berg, 1913)

Clupeonella sphaerocephala Berg [L. S.] 1913:20, Pl. 12 (figs. 1, 1a) [Maerialy k' Poznaniyu russkago rybolovstva, g.U.Z.i.Z., Department' Zemledelija v. 2 (no. 3)].

EN: Agrakhan shad.

Type locality: Off Tyuleniy Island, north of Agrakhan Bay, Russia, Caspian Sea.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

16. *Alosa volgensis* (Berg, 1913)

Clupeonella caspia volgensis Berg [L. S.] (ex Meissner) 1913:34, Pl. 5 [Maerialy k' Poznaniyu russkago rybolovstva, g.U.Z.i.Z., Department' Zemledelija v. 2 (no. 3)].

EN: Volga shad.

Type locality: Podovskaya Tonya near Cherny Yar, mouth of Volga River, Russia.

Distribution: Caspian Sea basin.

IUCN: Endangered.

Comment: Presence in Iranian waters needs confirmation. Record from Kottelat & Freyhof (2007).

Genus *Clupeonella* Kessler, 1877 (3 species)

Clupeonella Kessler [K. T.] 1877:187. Fem. *Clupeonella grimmi* Kessler, 1877. Type by monotypy.

Etymology: *Clupeonella*: Latin, clupea = sardine, derived from Clupeus = shield; diminutive.

17. *Clupeonella caspia* Svetovidov, 1941

Clupeonella delicatula caspia Svetovidov [A. N.] 1941:808 [C. R. (Doklady) Acad. Sci. URSS v. 31 (no. 8)].

EN: Caspian tyulka.

Type locality: Volga Delta, Russia, Caspian Sea.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Comment: Formerly identified as *Clupeonella cultriventris* (Nordmann, 1840).

18. *Clupeonella engrauliformis* (Borodin, 1904)

Clupea engrauliformis Borodin [N.A.] 1904:335 [Vestnik Rybopromyshlennosti St. Petersburg v. 19 (no. 6)].

EN: Anchovy tyulka (Fig. 19).

Type locality: Near Buinak, Caspian Sea, Russia.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

19. *Clupeonella grimmi* Kessler, 1877

Clupeonella grimmi Kessler [K. F.] 1877:187, Pl. 6 (fig. 24) [The Aralo-Caspian Expedition].

EN: Southern Caspian sprat, Bigeye kilka.

Type locality: Middle Caspian Sea, 560-1750 feet [80-250 Russian fathoms].

Distribution: Caspian Sea basin.

Comment: *Clupeonella grimmi* was originally described from the central part of the Caspian Sea.

IUCN: Not Evaluated.



Fig. 19. *Clupeonella engrauliformis*, Caspian Sea (K. Abbasi).

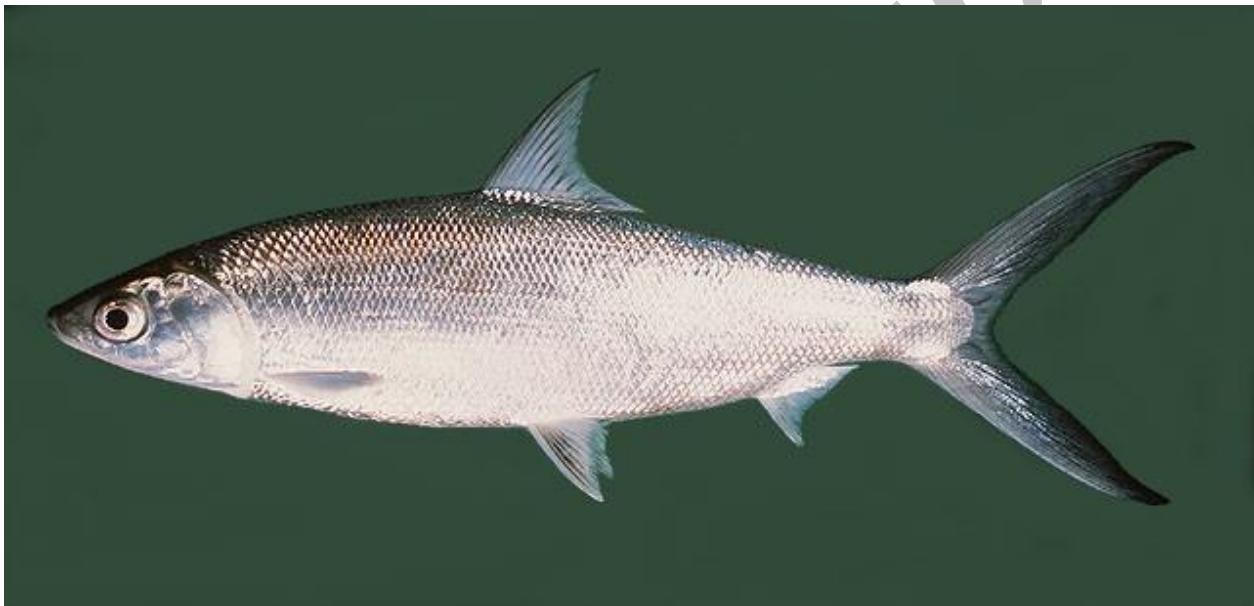


Fig. 20. *Chanos chanos*, courtesy of J.E. Randall.

Genus *Tenualosa* Fowler, 1934 (1 species)

Tenualosa (subgenus of *Hilsa*) Fowler [H. W.] 1934:246. Fem. *Alosa reevesii* Richardson, 1846. Type by original designation.

Etymology: *Tenualosa*: Latin, tenuis = thin + Latin, alausa = a fish cited by Ausonius and Latin, halec = pickle, dealing with the Greek word hals = salt; it is also the old Saxon name for shad = "alli".

20. *Tenualosa ilisha* (Hamilton, 1822)

Clupanodon ilisha Hamilton [F.] 1822:243, 382, Pl. 19 (fig. 73) [An account of the fishes found in the river Ganges].

EN: Hilsa.

Type locality: Ganges estuaries, Patua, Goyakarra, Calcutta, and Dhasa, India. No types known.

Distribution: Tigris and Persis; possibly Hormuz.

IUCN: Least Concern.

Order Gonorynchiformes (1 family, 1 genus and 1 species)

Family Chanidae (1 genus and 1 species)

Genus *Chanos* Lacepède, 1803 (1 species)

Chanos Lacepède [B.G.E.] 1803:395. Masc. *Chanos arabicus* Lacepède, 1803 (= *Mugil chanos* Forsskål, 1775). Type by monotypy.

Lacepède's *arabicus* is an unneeded substitute for *M. chanos*.

Etymology: *Chanos*: Greek, chanos, -eos, ous, and chasma, -atos = abyss, mouth opened, innensity.

21. *Chanos chanos* (Forsskål, 1775)

Mugil chanos Forsskål [P. S.] 1775:74, xiv [Descriptiones animalium (Forsskål)].

EN: Milkfish (Fig. 20).

Type locality: Jeddah, Saudi Arabia, Red Sea.

Distribution: Tigris, Persis, Hormuz and Makran.

IUCN: Not Evaluated.

Order Cypriniformes (3 families, 51 genera and 171 species, 2 unconfirmed)

Family Cyprinidae Rafinesque, 1815 (43 genera and 119 species, 1 unconfirmed)

Genus Abramis Cuvier, 1816 (1 species)

Abramis Cuvier [G.] 1816:194. Fem. *Cyprinus brama* Linnaeus, 1758. Type by subsequent designation. Earliest subsequent designation not located.

Etymology: *Abramis*: Greek, abramis, -idos = a fish.

22. *Abramis brama* (Linnaeus, 1758)

Cyprinus brama Linnaeus [C.] 1758:326 [Systema Naturae, Ed. X v. 1].

EN: Common bream.

Type locality: European lakes.

Distribution: The Caspian Sea basin and introduced to the Urmia Lake basin.

IUCN: Least Concern.

Genus Acanthobrama Heckel, 1843 (4 species)

Acanthobrama Heckel [J. J.] 1843:1033. Fem. *Acanthobrama marmid* Heckel, 1843. Type by subsequent designation. Type designated by Bleeker 1863:31 and 1863:210.

Etymology: *Acanthobrama*: Greek, akantha = thorn + old French breme, bresme, a fresh water fish.

Comment: Genus *Acanthalburnus* Berg, 1916 is a synonym.

23. *Acanthobrama marmid* Heckel, 1843

Acanthobrama marmid Heckel [J.J.] 1843: 1075 [85] [Ichthyologie [von Syrien]. In Russegger v. 1 (pt 2)].

EN: Mesopotamian bream.

Type locality: Kucik River at Aleppo (=Halab), Syria.

Distribution: Tigris.

IUCN: Least Concern.

24. *Acanthobrama microlepis* (De Filippi, 1863)

Abramis microlepis De Filippi [F.] 1863:393 [Archivio per la Zoologia, l'Anatomia e la Fisiologia. v. 2].

EN: Blackbrow bleak.

Type locality: *Abramis microlepis* (De Filippi, 1863) was originally described from Kura River near Tiflis [T'bilisi], Georgia, and Eurasia. Holotype (unique).

Distribution : Caspian Sea basin.

IUCN : Least Concern.

25. *Acanthobrama persidis* (Coad, 1981)*

Pseudophoxinus persidis Coad [B. W.] 1981:2058, fig. 1 [Canadian Journal of Zoology v. 59 (no. 11)].

EN: Persian bleak, Kor bleak.

Type locality: *Pseudophoxinus persidis* Coad, 1981 was originally described from Upper Shur River drainage, near Darab on Darab-Fasa road, 28°45.5'N, 54°24'E, Iran.

Distribution : Kor River, Persis, Maharlu and Hormuz basins.

IUCN: Not Evaluated.

Comment: Perea et al. (2010) and Teimori et al. (2015b) place *Petroleuciscus persidis* in *Acanthobrama* based on the molecular evidence which contradicts morphology. No recent record from Hormuz.

26. *Acanthobrama urmianus* (Günther, 1899)*

Abramis urmianus Günther [A.] 1899:389, Pl. 23 (fig. A) [The Journal of the Linnean Society of London. Zoology v. 27 (no. 177)].

EN: Urmia bream.

Type locality: *Abramis urmianus* Günther,

1899 was described from Ocksa River and Urmi River, Iran.

Distribution: Lake Urmia basin.

IUCN: Not Evaluated.

Genus *Alburnoides* Jetteles, 1861 (12 species)

Alburnoides Jetteles [L.H.] 1861:325. Masc. *Alburnus maculatus* Kessler, 1859. Type by monotypy.

Etymology: *Alburnoides*: From the city of Al Bura, where the fish was known + particle Greek, oides = similar.

Comment: Revision is needed to clarify status of some recent described species. *Alburnoides* cf. *taeniatus* (Kessler, 1874) was recently reported from the Hari (Tedzhen) River, Iran (Jouladeh-Roudbar et al. 2016a).

27. *Alburnoides coadi* Mousavi-Sabet, Vatandoust & Doadrio, 2015*

Alburnoides coadi Mousavi-Sabet [H.], Vatandoust [S.] & Doadrio [I.] 2015:308, figs. 9-11 [Caspian Journal of Environmental Sciences v. 13 (no. 4)].

EN : Kavir spirilin, Coad's riffle minnow.

Type locality: Namroud River, Hableroud River drainage, Kavir basin, Tehran Province, Iran, 35°43'N, 52°39'E.

Distribution: Kavir basin.

IUCN: Not Evaluated.

28. *Alburnoides damghani* Jouladeh-Roudbar, Eagderi, Esmaeili, Coad & Bogutskaya 2016*

Alburnoides damghani Jouladeh-Roudbar [A.], Eagderi [S.], Esmaeili [H.R.], Coad [B.W.] & Bogutskaya [N.G.] 2016:165, figs. 3-6 [ZooKeys No. 579].

EN: Damghan spirilin, Damghan riffle minnow.

Type locality : Cheshmeh Ali, Damghan River tributary, near Damghan City, Dasht-e Kavir basin, Semnan Province, Iran, 36°16'45.6"N, 54°05'01.6"E, elevation 1569 meters.

Distribution: Kavir basin.

IUCN: Not Evaluated.

29. *Alburnoides eichwaldii* (De Filippi, 1863)

Alburnus eichwaldii De Filippi [F.] 1863:392 [18] [Archivio per la Zoologia, l'Anatomia e la Fisiologia. v. 2].

EN: South western Caspian spirilin, Eichward's riffle minnow.

Type locality: Kura River near Tiflis [T'bilisi], Georgia.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

30. *Alburnoides holciki* Coad & Bogutskaya, 2012

Alburnoides holciki Coad [B.W.] & Bogutskaya [N.G.] 2012:44, figs. 1-2 [Zootaxa No. 3453].

EN: Hari spirilin, Holcik's riffle minnow (Figs. 21, 22).

Type locality: Hari River at Herat, 34°20'N, 62°12'E, Afghanistan.

Distribution: Hari (Tedzhen) River basin.

IUCN: Not Evaluated.

31. *Alburnoides idignensis* Bogutskaya & Coad, 2009*

Alburnoides idignensis Bogutskaya [N.G.] & Coad [B. W.] 2009:166, fig. 13 [Zoosystematica Rossica v. 18 (no. 1)].

EN: Tigris spirilin, Tigris riffle minnow.

Type locality: Bid Sorkh River between Sahneh and Kandgavar, Gav Masiab River drainage, ca. 34°23'N, 47°52'E, Kermanshahan, Iran.

Distribution: Tigris.

IUCN: Not Evaluated.

32. *Alburnoides namaki* Bogutskaya & Coad, 2009*

Alburnoides namaki Bogutskaya [N.G.] & Coad [B.W.] 2009:159, fig. 11 [Zoosystematica Rossica v. 18 (no. 1)].

EN: Namak spirilin, Namak riffle minnow.

Type locality: Qanat at Taveh, 35°07'N, 49°02'E, Hamadan, Iran.

Distribution: Namak Lake basin.

IUCN: Not Evaluated.



Fig. 21. *Alburnoides holciki*, Hari River (S. Eagderi).



Fig. 22. Hari River, natural habitat of *Alburnoides holciki*, on the border of Iran and Turkmenistan (S. Eagderi).

33. *Alburnoides nicolausi* Bogutskaya & Coad, 2009*

Alburnoides nicolausi Bogutskaya [N.G.] & Coad [B.W.] 2009:163, fig. 12 [Zoosystematica Rossica v. 18 (no. 1)].

EN: Seimareh spirilin, Karkheh spirilin, Nicholas' riffle minnow.

Type locality: Stream in Simareh River

drainage, 5 kilometers south of Nurabad, 34°03'30"N, 47°57'30"E, Lorestan, Iran.

Distribution: Tigris.

IUCN: Not Evaluated.

34. *Alburnoides parhami* Mousavi-Sabet, Vatandoust & Doadrio, 2015*

Alburnoides parhami Mousavi-Sabet [H.],

Vatandoust [S.] & Doadrio [I.] 2015:315, figs. 13-15 [Caspian Journal of Environmental Sciences v. 13 (no. 4)].

EN: Atrak spirilin, Parham riffle minnow.

Type locality: Baba-Aman Stream, Atrak River drainage, south-eastern Caspian Sea basin, Khorasan-e-Shomali Province, Iran, 37°29'N, 57°26'E. Holotype: VMFC-ALP3-H.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

35. *Alburnoides petrubanarescui* Bogutskaya & Coad, 2009*

Alburnoides petrubanarescui Bogutskaya [N. G.] & Coad [B. W.] 2009:154, fig. 10 [Zoosystematica Rossica v. 18 (no. 1)].

EN: Urmia spirilin, Banarescu's riffle minnow.

Type Locality: Qasemlou Chay, Urmia Lake basin, ca. 37°21'N, 45°09'E, Azarbaijan-e Bakhtari (West Azarbaijan, Iran).

Distribution: Lake Urmia basin.

IUCN: Not Evaluated.

Comment: There are few records from Iran.

36. *Alburnoides qanati* Coad & Bogutskaya, 2009*

Alburnoides qanati Coad [B. W.] & Bogutskaya [N. G.] 2009:68, figs. 1-2 [ZooKeys No. 13].

EN: Kor spirilin, Qanat spirilin.

Type locality: At source and along stream of a qanat at Naqsh-e Rostam, Pulvar (Sivand) River system, 29°59'30"N, 52°54'00"E, Fars, Iran.

Distribution: Kor River basin.

IUCN: Not Evaluated.

37. *Alburnoides samiii* Mousavi-Sabet, Vatandoust & Doadrio, 2015*

Alburnoides samiii Mousavi-Sabet [H.], Vatandoust [S.] & Doadrio [I.] 2015:321, figs. 17-19 [Caspian Journal of Environmental Sciences v. 13 (no. 4)].

EN: Sefidrud spirilin, Samii riffle minnow.

Type locality: Iran, Guilan Province, upper

Sefidrud River drainage, Tutkabon Stream.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

38. *Alburnoides tabarestanensis* Mousavi-Sabet, Anvarifar & Azizi, 2015*

Alburnoides tabarestanensis Mousavi-Sabet [H.], AnvariFar [H.] & Azizi [F.] 2015:146, figs. 1-3 [aqua, International Journal of Ichthyology v. 21 (no. 3)].

EN: Tajan spirilin.

Type locality: Tajan River in the southern Caspian Sea basin, Mazandaran Province, northern Iran.

Distribution: Tajan River, Caspian Sea basin.

IUCN: Not Evaluated.

Genus *Alburnus* Rafinesque, 1820 (8 species)

Alburnus Rafinesque [C. S.] 1820:236. Masc. *Cyprinus alburnus* Linnaeus, 1758. Type by absolute tautonymy.

Etymology: *Alburnus*: From the city of Al Bura, where the fish was known.

Comment: Genus proposed for European species, but no species mentioned; first addition of species not researched. Also appeared in Rafinesque 1820:46 (Dec.). *Chalcalburnus* Berg, 1933 is a synonym. Several members of this genus require revision.

39. *Alburnus amirkabiri* Mousavi-Sabet, Vatandoust, Khataminejad, Eagderi, Abbasi, Nasri, Jouladeh-Roudbar & Vasil'eva 2015*

Alburnus amirkabiri Mousavi-Sabet [H.], Vatandoust [S.], Khataminejad [S.], Eagderi [S.], Abbasi [K.], Nasri [M.], Jouladeh [A.] & Vasil'eva [E. D.] 2015:43, figs. 2-4, 5-6a [Journal of Ichthyology v. 55 (no. 1)].

EN: Namak bleak.

Type locality: Markazi Province, Ghareh-Chay River, in the Namak Lake basin, 34°53'N, 050°02'E, Iran.

Distribution: Namak Lake basin.

IUCN: Not Evaluated.

Comment: Its taxonomic position is under review and it might be considered as a synonym to other *Alburnus* species.

40. *Alburnus atropatenae* Berg, 1925*

Alburnus atropatenae Berg [L. S.] 1925:213 [Ezhegodnik. Zoologicheskogo Muzeya Imperatorskoi Akademii Nauk SSSR v. 26].
EN: Urmia bleak, Urmia shemaya.
Type Locality: Rivers of Lake Urmia, Iran.
Distribution: Lake Urmia basin.
IUCN: Not Evaluated.

41. *Alburnus caeruleus* Heckel, 1843

Alburnus caeruleus Heckel [J. J.] 1843:1084 [94] [Ichthyologie [von Syrien]. In Russegger v. 1 (pt 2)].
EN: Black spotted bleak.
Type Locality: Aleppo, Syria.
Distribution: Tigris River basin.
IUCN: Least Concern.

Comment: Records from Maroon River (Jarrahi River system) and Chardaval River (Karkheh river system), both in Tigris River (Zareian et al. 2015) and Hamadan Province by Keyvan Abbasi.

42. *Alburnus chalcoides* (Güldenstaedt, 1772)

Cyprinus chalcoides Güldenstädt [J. A. von] 1772:540, Pl. 16 [Novi Commentarii Academiae Scientiarum Imperialis Petropolitanae v. 16 (for 1771)].
EN: Caspian shemaya.
Type locality: Rivers of southern Russia. No types known. Type locality of the subspecies *iranicus* Near Shakhi, Talar River basin, entering Caspian Sea, Iran.
Distribution: Caspian Sea basin.
IUCN: Least Concern.
Comment: The subspecies *iranicus* Svetovidov, 1945 is a synonym.

43. *Alburnus filippii* Kessler, 1877

Alburnus filippii Kessler [K. F.] 1877:153 [The Aralo-Caspian Expedition].
EN: Kura bleak.
Type locality: Upper Kura River near Tbilisi, Georgia.
Distribution: Caspian Sea basin.
IUCN: Least Concern.

44. *Alburnus hohenackeri* Kessler, 1877

Alburnus hohenackeri Kessler [K. F.] 1877:156 [The Aralo-Caspian Expedition].
EN: North Caucasian bleak, Persian bleak.
Type locality: Karabakh, Azerbaijan.
Distribution: Native in the Caspian Sea basin and translocated to other basins in Iran (Tigris, Hari, Urmia, Sistan and possibly in Makran, see Zareian et al. 2013).

Comments: Previously the wide-ranging species *Alburnus alburnus* (Linnaeus, 1758) was identified as the taxon in Iran. *Alburnus charusini* Herzenstein, 1889 is a synonym.

45. *Alburnus mossulensis* Heckel, 1843

Alburnus mossulensis Heckel [J. J.] 1843:1086 [96] [Ichthyologie [von Syrien]. In Russegger v. 1 (pt 2)].
EN: Mesopotamian bleak.
Type locality: Tigris River near Mosul, Iraq.
Distribution: Esfahan, Tigris River, Kor River, Lake Maharlu, Persis and Hormuz.
IUCN: Not Evaluated.

Comment: A wide-ranging species with several available names usually placed in synonymy but possibly valid including *Alburnus capito* Heckel, 1843 from Kurdistan and *Alburnus iblis* Heckel, 1849 (Persepolis area and the waters of the Araxes, Iran), *Alburnus schejtan* Heckel, 1849 (Araxes [= Kor] River at Persepolis, Iran), *Alburnus caudimacula* Heckel, 1849 (Kara Agatsch River and near the village of Gerè, Iran.) and *Alburnus megacephalus* Heckel, 1849 (Araxes [= Kor] River, Fars, Iran). The work by Heckel, in which the descriptions of the three latter species (and many others below) are given, is dated 1846–1849 and copies we have seen do not have any dating internally, so, we use the later date. The online CAS Catalog of Fishes refers to a Fowler's manuscript and uses the date 1847. Its taxonomic position is under revision. *Alburnus sellal* Heckel, 1843 might have taxonomic priority.

46. *Alburnus zagrosensis* Coad, 2009*

Alburnus zagrosensis Coad [B. W.] 2009:64, fig. 1 [Zoology in the Middle East v. 48].

EN: Zagros bleak.

Type locality: stream 3 kilometers east of Boldaji, upper Karun River basin, 31°55'N, 51°05'E, Zagros Mountains, Chahar Mahall va Bakhtiari, Iran.

Distribution: Tigris.

IUCN: Not Evaluated.

Comment: Very closely related to *Alburnus mossulensis* based on COI and cyt b sequences data.

Genus Arabibarbus Borkenhagen, 2014 (1 species)

Arabibarbus Borkenhagen [K.] 2014:1183.

Arabibarbus hadhrami Borkenhagen, 2014.

Type by original designation.

Etymology: The name *Arabibarbus* is an allusion to the geographic range of the genus.

47. Arabibarbus grypus (Heckel, 1843)

Barbus grypus Heckel [J. J.] 1843:1048 [58]

[Ichthyologie [von Syrien]. In Russeger v. 1 (pt 2)].

EN: Shirbot.

Type locality: Tigris River, Mosul, Iraq.

Distribution: Tigris, Persis and Hormuz.

IUCN: Not Evaluated.

Comment: *Labeobarbus kotschy* Heckel, 1843 and *Tor grypus* (Heckel, 1843) are synonyms.

Genus Ballerus Heckel, 1843 (1 species)

Ballerus Heckel [J. J.] 1843:1033. Masc.

Cyprinus ballerus Linnaeus, 1758. Type by monotypy (also by absolute tautonymy).

48. Ballerus sapa (Pallas, 1814)

Cyprinus sapa Pallas [P.S.] 1814:328 [Zoographia Rosso-Asiatica v. 3].

EN: White-eye bream.

Type locality: Volga River and tributaries.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Comment: *Abramis sapa bergi* Belyaev, 1929 is the southern Caspian Sea subspecies but not recognized by some authors. Formerly placed in the genus *Abramis*

Cuvier, 1816 but Perea et al. (2010) place this species in *Ballerus*.

Genus Bangana Hamilton, 1822 (1 species)

Bangana (subgenus of *Cyprinus*) Hamilton [F.] 1822:277, 385. Fem. *Cyprinus dero* Hamilton, 1822. Type by subsequent designation. Treated as feminine, Art. 30.2.4. Type designated by Jordan 1917:155.

Etymology: *Bangana*: from the Bengali vernacular bangana, used in reference to “most species” of *Mugil* (Mugilidae) and certain cyprinids, all of which possess an “elevated longitudinal ridge on the middle of the lower jaw”.

49. Bangana dero (Hamilton, 1822)

Cyprinus dero Hamilton [F.] 1822:277, 385, Pl. 22 (fig. 78) [An account of the fishes found in the river Ganges].

EN: Kalabans.

Type locality: Brahmaputra River, India. No types known.

Distribution: Mashkid River basin (see Esmaeili et al. 2013a).

IUCN: Least Concern.

Genus Barbus Cuvier, 1816 (3 species)

Cuvier [G.] & Cloquet [H.] 1816:4. Masc. *Cyprinus barbus* Linnaeus, 1758. Type by absolute tautonymy. Fowler (MS) attributes to Cuvier & Cloquet (Dict. Nat., ed. 2, v. 4, suppl.) as prior to Cuvier 1816; see also Hoedeman 1958.

Etymology: *Barbus*: Latin, barbus = barbel.

Several members of this genus require revision.

50. Barbus cyri De Filippi, 1865

Barbus cyri De Filippi [F.] 1865:358 [Note di un viaggio in Persia nel 1862].

EN: Kura barbel.

Type locality: Kura River near Tiflis, Georgia.

Distribution: Caspian Sea and Urmia basins.

IUCN: Not Evaluated.

Comment: Berg (1948-1949) refers Caspian Sea basin specimens to *Barbus lacerta cyri*. It recognized as a full species by Naseka & Bogutskaya (2009) and Levin et al. (2012).

51. *Barbus lacerta* Heckel, 1843

Barbus lacerta Heckel [J.J.] 1843:1044 [54]
[Ichthyologie [von Syrien]. In Russegger v.
1 (pt 2)].

EN: Tigris barbel.

Type locality: Kueik [Qwaik] River near
Aleppo, Syria.

Distribution: Tigris.

IUCN: Least Concern.

52. *Barbus miliaris* De Filippi, 1863

Barbus miliaris De Filippi [F.] 1863:393
[Archivio per la Zoologia, l'Anatomia e la
Fisiologia. v. 2].

EN: Namak barbel (Figs. 23,24).

Type locality: Near Tehran, Iran.

Distribution: Namak Lake and Kavir basins.

IUCN: Not Evaluated.

Comment: Re-description of this species is
provided by Khaefi et al. (2017).



Fig. 23. *Barbus miliaris*, Qom River, Namak Lake basin (H.R. Esmaeili).



Fig. 24. Natural habitat of *Barbus miliaris*, Qom River, Namak Lake basin (H.R. Esmaeili).

Genus *Barilius* Hamilton, 1822 (1 species)

Barilius (subgenus of *Cyprinus*) Hamilton [F.] 1822:266, 384. Masc. *Cyprinus barila* Hamilton, 1822. Type by subsequent designation. Type designated by Bleeker 1863:203, 1863:263 and 1863:28.

Etymology: *Barilius*: from *barila*, a vernacular Bengali name for the species *B. barila*, the type species.

53. *Barilius mesopotamicus* Berg, 1932

Barilius mesopotamicus Berg [L.S.] 1932:333, fig. 1 [Zoologischer Anzeiger v. 100 (nos 11/12)].

EN: Mesopotamian barilius.

Type locality: Gawi River, Tigris River basin, 33°20'N, 46°20'E, Iraq.

Distribution: Tigris and Persis.

IUCN: Least Concern.

Genus *Blicca* Heckel, 1843 (1 species)

Blicca Heckel [J. J.] 1843:1032. Fem. *Cyprinus blicca* Bloch 1782. Type by monotypy (also by absolute tautonymy).

Etymology:

54. *Blicca bjoerkna* (Linnaeus, 1758)

Cyprinus bjoerkna Linnaeus [C.] 1758:326 [Systema Naturae, Ed. X v. 1].

EN: Silver bream.

Type locality: Greifswald, Mecklenburg-Vorpommern, 54°05'N, 13°23'E, Germany.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Comment: *Blicca bjoerkna transcaucasica* Berg, 1916 from the lower reaches of the Kura River, Araks and Lenkoran District is a valid subspecies or a synonym according to authors.

Genus *Cabdio* Hamilton, 1822 (1 species)

Cabdio (subgenus of *Cyprinus*) Hamilton [F.] 1822:333, 392. Masc. *Cyprinus (Cabdio) jaya* Hamilton 1822. Type by subsequent designation. Type designated by Jordan 1917:115.

Etymology:

55. *Cabdio morar* (Hamilton, 1822)

Cyprinus morar Hamilton [F.] 1822:264, 384, Pl. 31 (fig. 75) [An account of the fishes found in the river Ganges].

EN: Morar.

Type locality: Yamuna and Tista rivers, India. No types known.

Distribution: Makran and Mashkid (see Esmaeili et al. 2015b).

IUCN: Least Concern.

Comment: *Aspidoparia morar* (Hamilton, 1822) is a synonym.

Genus *Capoeta* Valenciennes, 1842 (12 species)

Fem. *Cyprinus capoeta* Gldenstdt, 1773. Type by absolute tautonymy, not *amphibia* by subsequent designation of Bleeker 1863:200. *Scaphiodon* Heckel [J.J.] 1843:1020 is a synonym.

Etymology: *Capoeta*: The local vernacular name "kapwaeti" used in Georgia and Azerbaijan.

Several members of this genus are under revision. Based on molecular data provided by Ghanavi et al. (2016) it seems that 7 new species of *Capoeta* might be available in Iran.

56. *Capoeta aculeata* (Valenciennes, 1844)*

Chondrostoma aculeatum Valenciennes [A.] in Cuvier & Valenciennes 1844:408 [Histoire naturelle des poissons v. 17].

EN: Common large scale scraper.

Type locality: Probably the Pulvar (= Sivand) River, near Persepolis, Fars, Iran.

Distribution: Namak Lake, Kavir, Kerman-Na'in, Esfahan, Kor and Tigris.

IUCN: Not Evaluated.

Comment: *Scaphiodon macrolepis* Heckel, 1849 and *Varicorhinus bergi* Derzhavin, 1929 are synonyms from Iran.

57. *Capoeta alborzensis* Jouladeh-Roudbar, Eagderi, Ghanavi & Doadrio, 2016*

Capoeta alborzensis Jouladeh-Roudbar [A.], Eagderi [S.], Ghanavi [H. R.] &

Doadrio [I.] 2016:169, figs. 2-5 [FishTaxa v. 1 (no. 3)].

EN: Alborz scraper.

Type locality: Iran: Tehran prov.: Nam River, tributary of Hableh River, near Harandeh village, 35°42'41.1"N, 52°40'19.7"E

Distribution: Kavir basin.

IUCN: Not Evaluated.

58. *Capoeta anamisensis* Zareian, Esmaeili & Freyhof, 2016*

Capoeta anamisensis Zareian [H.], Esmaeili [H. R.] & Freyhof [J.] 2016:133, figs. 3-5, 6a, 7a and 8 [Zootaxa 4083 (no. 1)].

EN: Minab scraper.

Type locality: Iran: Hormuzgan province. Moradabad River at Ziarat Ali, Minab River Drainage.

Distribution: Makran (Zareian et al. 2016).

IUCN: Not Evaluated.

59. *Capoeta buhsei* Kessler, 1877*

Capoeta buhsei Kessler [K.F.] 1877:85 [The Aralo-Caspian Expedition].

EN: Namak scraper.

Type locality: Probably Karaj River, near Tehran.

Distribution: Namak Lake basin.

IUCN: Least Concern.

Comment: *Varicorhinus nikolskii* Derzhavin, 1929 from Karaj River, 30 kilometers from Teheran, Iran is a synonym.

60. *Capoeta Capoeta* (Güldenstaedt, 1773)

Cyprinus capoeta Güldenstädt [J. A. von] 1773:508, Pl. 8 [Novi Commentarii Academiae Scientiarum Imperialis Petropolitanae v. 17 (for 1772)].

EN: Caucasian scraper.

Type locality: Tiflis, Caspian Sea. No types known.

Distribution: Caspian Sea, Hari, Urmia, Kavir, Bedjestan, Sirjan, Namak, Esfahan, Tigris.

IUCN: Not Evaluated.

Comment: *Capoeta gracilis* (Keyserling,

1861) has been considered as Iranian subspecies but this wide-ranging species needs revision. The subspecies has been recognised as a full species by authors. *Scaphiodon asmussii* Keyserling, 1861 and *Capoeta gibbosa* Nikol'skii, 1897 are Iranian synonyms.

61. *Capoeta coadi* Alwan, Zareian & Esmaeili, 2016*

Capoeta coadi Alwan [N. H.], Zareian [H.] & Esmaeili [H. R.] 2016:158, figs. 1-4 [ZooKeys No. 572].

EN: Karun scraper, Coad's scraper.

Type locality: Karun River drainage, Beshar (Bashar) River at Tale Gah village, Kohgiluyeh and Boyer Ahmad.

Distribution: Karun River drainage (Tigris).

IUCN: Not Evaluated.

62. *Capoeta fusca* Nikol'skii, 1897

Capoeta fusca Nikolskii [A.M.] 1897:340 [Ezhegodnik. Zoologicheskogo Muzeya Akademii Nauk SSSR. v. 1].

EN: Desert scraper.

Type locality: Berg (1949) gives the locality in Russian as "Mondekhi, northern periphery of the Bajistan Salt Desert in southeast Khorasan". This locality is possibly Mandehi or Miandehi at 34°53'N, 58°38'E.

Distribution: Hari River, Kavir, Bedjestan, Sistan and Lut.

IUCN: Not Evaluated.

Comment: *Capoeta nudiventris* Nikol'skii, 1897 is a synonym.

63. *Capoeta heratensis* (Keyserling 1861)

Scaphiodon heratensis Keyserling [E. von] 1861:11 [15], Pl. 6 [Zeitschrift für die Gesamten Naturwissenschaften v. 17 (no. 1)].

EN: Hari Scraper.

Type locality: Heri-rud at Herat, Afghanistan. No types saved.

Distribution: Hari-rud River basin.

IUCN: Not Evaluated.

64. *Capoeta mandica* Bianco & Bănărescu, 1982*

Capoeta barroisi mandica Bianco [P. G.] & Bănărescu [P. M.] 1982:90, figs. 1C, 2C [Cybium 3e série. Bulletin de la Société Française d'Ichtyologie v. 6 (no. 2).

EN: Mond scraper

Type locality: Mond River (called Mand by Bianco & Bănărescu, 1982), near Dasht-e Arzhan (correct name is Dasht-e Arjan), Persis basin, Iran.

Distribution: Persis (Zareian et al. 2016a,b).

IUCN: Not Evaluated.

Comment: Ozuluğ & Freyhof (2008) consider *Capoeta barroisi mandica* Bianco & Bănărescu, 1982 to be a valid species without providing morphological and molecular characteristics.

65. *Capoeta saadii* (Heckel, 1849)*

Scaphiodon saadii Heckel [J. J.] 1847:260 [Reisen in Europa, Asien und Africa v. 2 (pt 3)].

EN: Saadi scraper.

Type locality: Pulwar River (Sivand), Kor River basin, near Persepolis, ruins northeast of Shiraz, Iran.

Distribution: Kor, Esfahan, Persis, Tigris, Maharlou, Sirjan, Kerman-Na'in and Hormuz.

IUCN: Not Evaluated.

Comment: *Scaphiodon saadii* Heckel, 1847 was described from Persepolis, Pulwar River (Sivand), Kor River basin, ruins northeast of Shiraz, Iran. The following taxa named from Iran have been regarded as synonyms: *Scaphiodon amir* Heckel, 1849, *Scaphiodon niger* Heckel, 1849, *Scaphiodon saadii* Heckel, 1849, *Scaphiodon chebisiensis* Keyserling, 1861, *Scaphiodon rostratus* Keyserling, 1861 and *Capoeta capoeta intermedia* Bianco & Bănărescu, 1982 (non *Capoeta intermedia* Temminck & Schlegel, 1846= *Acheilognathus lanceolata* (Temminck & Schlegel, 1846). *Capoeta damascina* was earlier considered by many authors as one of the most common freshwater fish

species found throughout the Levant, Mesopotamia, Turkey and Iran. However, it seems that *C. damascina* is restricted to the Damascus basin, Syria (Alwan et al. 2016a,b).

66. *Capoeta trutta* (Heckel, 1843)

Scaphiodon trutta, Heckel [J. J.] 1843:1056 [66] [Ichthyologie [von Syrien]. In Russegger v. 1 (pt 2)].

EN: Longspine scraper.

Type locality: The type localities of *Capoeta trutta* as given by Heckel (1843b) are “Gewässern bei Aleppo, Syria” and the “Tigris bei Mossul, Iraq” both in Tigris River basin.

Distribution: Tigris and Zohreh (Zareian et al. 2016a,b).

IUCN: Least Concern.

67. *Capoeta umbla* (Heckel, 1843):

Scaphiodon umbla Heckel [J. J.] 1843:1060 [70] [Ichthyologie [von Syrien]. In Russegger v. 1 (pt 2)].

EN: Tigris scraper (Figs. 25,26).

Type locality: Tigris River, Mosul, Iraq.

Distribution: Tigris River basin.

IUCN: Least Concern.

Comment: *Capoeta umbla* has been questionably considered as a synonym of *Capoeta damascina* (Valenciennes, 1842) (see Coad 1991, 1995) or a distinct valid species (Banărescu 1999; Turan et al. 2006; Özuluğ & Freyhof 2008). Based on genetic data using the 16S rDNA marker, Turan (2008) suggested the conspecificity of *C. c. umbla* and *C. c. kosswigi* with *C. trutta* despite the morphological differences among them which, according to him, could be environmentally induced. Recently Levin et al. (2012) reconstructed the matrilineal phylogeny of several Asian algae-eating fishes of the genus *Capoeta* (except *C. umbla*) based on complete mitochondrial gene for cytb sequences from the majority of their distribution ranges. According to them, *Capoeta* forms a strongly supported

monophyletic subclade nested within the genus *Luciobarbus* clade, suggesting that specialized scraping morphology appeared once in the evolutionary history of the genus. They detected three main groups of *Capoeta*: the Mesopotamian group, which includes three species from the Tigris-Euphrates system and adjacent waterbodies, the Anatolian-Iranian group, which has the most diversified structure and encompasses many species distributed throughout Anatolian and Iranian inland waters, and the

Aralo-Caspian group, which consists of species distributed in basins of the Caspian and Aral Seas, including many dead-end rivers in Central Asia and Northern Iran. Based on the potential distribution range of *C. umbla*, Freyhof (2014) expected its presence in Iran, Iraq, Syria, and Turkey (Turkey-in-Asia). Esmaeili et al. (2016e) reviewed the taxonomy of this taxon and confirmed its presence from the Iranian part of Tigris River.



Fig. 25. *Capoeta umbla*, Garan River, a tributary of Sirvan River, Persian Gulf basin (H.R. Esmaeili).



Fig. 26. Natural habitat of *C. umbla*, Garan River, Tigris, Persian Gulf basin (H.R. Esmaeili).

Genus *Carasobarbus* Karaman, 1971 (3 species)

Carasobarbus Karaman [M. S.] 1971:230. Masc. *Systemus luteus* Heckel, 1843. Type by original designation (also monotypic).

Etymology: *Carasobarbus*: Latinization of, karass, karasche, European crucian carp + Latin, barbus = barbel.

Comment: Taxonomic revision of the genus *Carasobarbus* Karaman, 1971 is given by Borkenhagen & Krupp (2013). *Kosswigobarbus* Karaman [M.S.] 1971:239 is a synonym.

68. *Carasobarbus kosswigi* (Ladiges, 1960): *Cyclocheilichthys kosswigi* Ladiges [W.] 1960:135, fig. 7 [Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut v. 58].

EN: Kiss-lip himri.

Type locality: Batman Çayı (N37°47'16", E41°0'51"), Turkey.

Distribution: Tigris.

IUCN: Vulnerable.

Comment: *Kosswigobarbus kosswigi* (Ladiges, 1960) is a synonym.

69. *Carasobarbus luteus* (Heckel, 1843) *Systemus luteus* Heckel [J. J.] 1843:1061 [71] [Ichthyologie [von Syrien]. In Russegger v. 1 (pt 2)].

EN: Mesopotamian himri.

Type locality: Heckel (1843b) gives localities for the types of *Systemus luteus* as "Orontes", and "Tigris", and in the next sentence at "Aleppo, Syria" and "Mossul, Iraq". Borkenhagen & Krupp (2013) consider paralectotypes of *Systemus luteus* from Nahr Quwayq, near Aleppo [N36°12'10", E37°9'31"], Syria.

Distribution: Tigris, Kor, Maharlu, Persis and Hormuz.

IUCN: Least Concern.

Comment: *Systemus albus* var. *alpina* Heckel, 1849 (from Rūdkhāneh-ye Qarah Āghāj near Shīrāz = Qarah Āghāj River, Mond, Persis basin, [N29°31'3", E52°15'0"] and also from Daryācheh-ye Parīshān = Parishan wetland [N29°31'7", E51°47'47"])

and *Barbus parieschanica* Wossughi, Khoshzahmat & Etemadfar, 1982 from Parishan wetland, Helleh river basin, Iran are synonyms (see Borkenhagen & Krupp 2013).

70. *Carasobarbus sublimus* (Coad & Najafpour, 1997)*

Barbus sublimus Coad [B. W.] & Najafpour [N.] 1997:274, fig. 1 [Ichthyological Exploration of Freshwaters v. 7 (no. 3).

EN: Persian himri.

Type locality: Rūdkhāneh-ye A'lā (Ala River, Jarahi drainage) at Pol-e Tighen (N31°23'30", E49°53'0"), Khuzestan, Iran.

Distribution: Tigris and Zohreh.

IUCN: Not Evaluated.

Genus *Carassius* Jarocki, 1822 (2 species)

Carassius (subgenus of *Cyprinus*) Jarocki [F. P.] 1822:54, 74. Masc. *Cyprinus carassius* Linnaeus, 1758. Type by absolute tautonymy. Apparently first appeared in Jarocki 1822:54, 71; Kottelat (2013) says 1822:54 and 74 in Jarocki 1822. This was credited to Jarocki on Feb. 5, 2013.

Etymology: *Carassius*: Latinization of, karass, karasche, European crucian carp; *auratus*: From the words *carassius*-Latin of karass (common name for these fishes in Eurasia) and *auratus*, meaning gilded.

71. *Carassius auratus* (Linnaeus, 1758)**

Cyprinus auratus Linnaeus [C.] 1758:322 [Systema Naturae, Ed. X v. 1] China; Japanese rivers. No types known. Neotype designation by Fricke 1999:83 is invalid; see Fricke 2000:639. Paepke 1999:70 treats types for *Cyprinus auratus* var. a and var. c of Bloch, 1784. Also appeared in Linnaeus 1759:252.

EN: Goldfish.

Type locality: *Cyprinus auratus* was originally described from China and Japanese rivers (see also Kottelat 2013; Zhang et al. 2016).

Distribution: Introduced to several Iranian

basins.

IUCN: Least Concern.

72. *Carassius gibelio* (Bloch, 1782)**

Cyprinus gibelio Bloch [M. E.] 1782:71, Pl. 12 [M. Marcus Elieser Bloch's, ausübenden Arztes zu Berlin, Oeconomische Naturgeschichte der Fische Deutschlands v. 1.

EN: Prussian carp.

Type locality: Odra River system, Silesia, Czech Republic.

Distribution: Probably mirrors distribution of *C. auratus*.

IUCN: Not Evaluated.

Comment: Kottelat & Freyhof (2007); Bogutskaya et al. (2008, with question), Esmaeili et al. (2010a), Kalous et al. (2012), Dylidin & Orlov (2016) and Semenchenko et al. (2016) considered it as distinct species.

Genus *Chondrostoma* Agassiz, 1832 (4 species)

Chondrostoma Agassiz [L.] 1832:132. Neut. *Cyprinus nasus* Linnaeus, 1758. Type by monotypy. Probably can date to Agassiz 1832 as above, with type by monotypy. Spelled *Chondrostomus* by Heckel 1843:1030. Also in Agassiz 1835:38 with type designated by Bleeker 1863:197 or 1863:26.

Etymology: *Chondrostoma*: Greek, chondros = cartilage + Greek, stoma = mouth. Name referring to the characteristic horny layer on the lower lip.

73. *Chondrostoma cyri* Kessler, 1877

Chondrostoma cyri Kessler [K. F.] 1877:137, Pl. 5 (fig. 21) [The Aralo-Caspian Expedition.

EN: Southern Caspian nase.

Type locality: Kura River, Tbilisi, Georgia.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

74. *Chondrostoma orientale* Bianco & Bănărescu, 1982*

Chondrostoma cyri orientale Bianco [P. G.] & Bănărescu [P. M.] 1982:80, figs. 1A, 2A [Cybium 3e série. Bulletin de la Société

Française d'Ichtyologie v. 6 (no. 2).

EN: Kor nase.

Type locality: Pulwar River (=Sivand), Kor River basin, near Persepolis, Fars, Iran.

Distribution: Kor River basin.

IUCN: Not Evaluated, however, it has not been collected during the last 10 years by authors, hence it might be considered as critically endangered.

Comment: Sometimes regarded as a synonym of *C. regium*.

75. *Chondrostoma regium* (Heckel, 1843)

Chondochilus regius, Heckel [J.J.] 1843: 1077 [87] [Ichthyologie [von Syrien]. In Russegger v. 1 (pt 2).

EN: Mesopotamian nase.

Type locality: *Chondochilus regius* Heckel, 1843 was described from the "Orontes" (= Asi) (but see below) and "Tigris". The type locality "Orontes" (= Asi) in Heckel (1843b) seems to be an error.

Distribution: Tigris, Zohreh, and Esfahan.

IUCN: Least Concern.

76. *Chondrostoma* sp.*

Distribution: The Tigris River drainages.

Comment: Under revision.

Genus *Ctenopharyngodon* Steindachner, 1866 (1 species)

Ctenopharyngodon Steindachner [F.] 1866:782. Masc. *Ctenopharyngodon laticeps* Steindachner, 1866. Type by monotypy.

Etymology: *Ctenopharyngodon*: Greek, kteis, ktenos = comb + Greek, pharyngx = pharynx + Greek, odous = teeth; *idella*: *Cteno*=comb; *pharyngx*=throat; *odon*=tooth (in reference to its comblike pharyngeal teeth); and *idella*: presumably derived from the Greek idios, distinctive or peculiar.

77. *Ctenopharyngodon idella* (Valenciennes, 1844)**

Leuciscus idella Valenciennes [A.] in Cuvier & Valenciennes 1844:362 [Histoire naturelle des poissons v. 17] China. No types known

EN: Grass carp.

Type locality: China. No types known.

Distribution: Introduced to the Caspian Sea, Tigris River, Kor River, Maharlu and Sistan basins; elsewhere in reservoirs throughout Iran.

IUCN: Not Evaluated in its native distribution range.

Genus *Cyprinion* Heckel, 1843 (5 species)

Cyprinion Heckel [J. J.] 1843:1015. Neut. *Cyprinion macrostomus* Heckel, 1843. Type by subsequent designation. Type designated by Jordan 1919:211. *Cyprinium* Agassiz, 1846:114 is an unjustified emendation.

Etymology: *Cyprinion*: Diminutive of Latin, *cyprinus* = carp.

Comment: *Scaphiodon* Heckel, 1843 has been used for *Cyprinion* and *Capoeta* species in Southwest Asia.

78. *Cyprinion kais* Heckel, 1843

Cyprinion kais Heckel [J. J.] 1843:1066 [76] [Ichthyologie [von Syrien]. In Russeger v. 1 (pt 2).

EN: Smallmouth lotak.

Type locality: The type localities for *Cyprinion kais* are "Aleppo, Syria" and "Mossul, Iraq" and for *Cyprinion cypris* the "Tigris bei Mossul" (Heckel, 1843b) or Tigris River basin.

Distribution: Tigris.

IUCN: Least Concern.

79. *Cyprinion macrostomum* Heckel, 1843

Cyprinion macrostomum Heckel [J.J.] 1843:1065 [75]. [Ichthyologie [von Syrien]. In Russeger v. 1 (pt 2).

EN: Largemouth lotak.

Type locality: Tigris River basin (Aleppo, Syria and Mosul, Iraq).

Distribution: Tigris and probably Persis.

IUCN: Least Concern.

Comment: Originally spelt *macrostomus* but correctly *macrostomum* (Berg, 1949).

80. *Cyprinion milesi* (Day, 1880)

Barbus milesi Day [F.] 1880:228 [6]

[Proceedings of the Zoological Society of London 1880 (pt 2) (art. 1).

EN: Eastern lotak.

Type locality: *Barbus milesi* was described from "a spring at Trâl", Pakistan.

Distribution: Hormuz, Hamun-e Jaz Murian and Makran.

IUCN: Not Evaluated.

Comments: Iranian synonyms are *Barbus bampurensis* Nikol'skii, 1899 and *Barbus baschakirdi* Holly, 1929.

81. *Cyprinion tenuiradius* Heckel, 1849*

Cyprinion tenuiradius Heckel [J. J.] 1847:261 [Reisen in Europa, Asien und Africa v. 2 (pt 3).

EN: Qarah Aqaj lotak (Figs. 27, 28).

Type locality: The "Kara-Agatsch als aus dem Araxes" (= Qarah Aqaj River, and the Kor River, Fars).

Distribution: Persis.

IUCN: Least concern.

Comment: Karaman (1971) assigns this taxon as a subspecies of *Cyprinion macrostomum* and Bianco & Banarescu (1982) suggest it may be a subspecies in a polytypic species. Berg (1949) records it from the Tigris River where it may be sympatric with *C. macrostomum*. He considers it to be close to that species, perhaps its southeastern subspecies. Howes (1982) considers *tenuiradius* to be a variant of *C. macrostomum*.

82. *Cyprinion watsoni* (Day, 1872)

Scaphiodon watsoni Day [F.] 1872:324 [Journal of the Asiatic Society of Bengal v. 41 (pt 2, nos 1-4

EN: Indus lotak.

Type locality: Rivers on Sind Hills, Pakistan and the Salt Range of the Punjab.

Distribution: Hormuz, Hamun-e Jaz Murian, Mashkid, Makran, Sistan and Lut basins.

IUCN: Least Concern.

Comments: Iranian synonyms are *Cyprinion kirmanense* Nikol'skii, 1900, *Cirrhina afghana* var. *nikolskii* Berg, 1905, *Scaphiodon macmahoni* Regan, 1906 and

Scaphiodon baluchiorum Jenkins, 1910. Some authors consider Iranian populations to *Cyprinion microphthalmum* (Day 1880).

Scaphiodon microphthalmus Day, 1880 was originally described from Quetta, Pakistan.



Fig. 27. *Cyprinion tenuiradius*, Mond River, Persis, Persian Gulf basin (H.R. Esmaeili).



Fig. 28. Natural habitat of *Cyprinion tenuiradius*, Mond River, Persis, Persian Gulf basin (H.R. Esmaeili).

Genus *Cyprinus* Linnaeus, 1758 (1 species)

Cyprinus Linnaeus [C.] 1758:320. Masc. *Cyprinus carpio* Linnaeus, 1758. Type by subsequent designation. Type designated by Desmarest 1856:283- see Whitley 1939:225 but Whitley has incorrect date for Desmarest; also by Jordan & Gilbert 1883:254. On Official List (Opinion 77). Misspelled *Ciprinus* by Anonymous (Cabrera, Pérez & Haenseler) 1817.

Etymology: *Cyprinus*: Latin, cyprinus = carp; *carpio*: *carpio* is the latinized form of carp. *Cyprinus* is the old world name for the carp.

83. *Cyprinus carpio* Linnaeus, 1758**

Cyprinus carpio Linnaeus [C.] 1758:320 [Systema Naturae, Ed. X v. 1.

EN: Wild common carp.

Type locality: Europe.

Distribution: Native populations in the Caspian Sea basin; also introduced there and elsewhere in Iran.

IUCN: Vulnerable (native population).

Genus *Garra* Hamilton, 1822 (13 species, 1 unconfirmed)

Garra (subgenus of *Cyprinus*) Hamilton [F.] 1822:343, 393. Fem. *Cyprinus (Garra) lamta* Hamilton, 1822. Type by subsequent designation. Type designated by Bleeker 1863:192, 1863:262 or 1863:24.

Etymology: *Garra*: Name based on a vernacular Indian name (Hamilton, 1822:343).

Comment: It was recently reviewed by Esmaeili et al. (2016c).

84. *Garra amirhosseini* Esmaeili, Sayyadzadeh, Coad & Eagderi, 2016*

Garra amirhosseini Esmaeili [H. R.], Sayyadzadeh [G.], Coad [B. W.] & Eagderi [S.] 2016:87, figs. 2-10 [Iranian Journal of Ichthyology v. 3 (no. 2).

EN: Hot spring garra, Amirhossein's garra.

Type locality: Sartang-e-Bijar hot spring at Mehran, Tigris River drainage, 33°46'16.3"N 45°56'17.2"E; G. Sayyadzadeh and A. Mansouri, 26 Oct 2015.

Distribution: Tigris.

IUCN: Least concern.

85. *Garra gymnothorax* (Berg, 1949)*

Garra rufa gymnothorax, Berg [L.S.] 1949:792, figs. 4-5 [Trudy Instituta Zoologii/ Akademiia Nauk SSSR v. 8 (no. 4).

EN: Chest scaleless garra.

Type locality: Tigris River

Distribution: Karun River system in the Helayjan River at Izeh, Balarud River at Andimeshk and Bashar River at Yasouj.

IUCN: Least concern.

86. *Garra elegans* (Günther, 1868)

Tylognathus elegans Günther [A.] 1868:64 [Catalogue of the fishes in the British Museum v. 7.

EN: Elegant garra.

Type locality: Mesopotamia?

Distribution: *Garra elegans* is found in the Tigris River drainage in Iraq (Freyhof 2016a) and probably Iran. It is known from the lower Little Zab River, the Sirvan River, and the lower Tigris (Coad 2010, Freyhof 2016a).

IUCN: Not Evaluated.

Comment: *Hemigrammocapoeta elegans* (Günther, 1868) is a synonym. It was formerly placed in the genera *Tylognathus* Heckel, 1843 and *Hemigarra* Karaman, 1971. Molecular studies by Esmaeili et al. (2016c) place *G. elegans* close to *G. amirhosseini*, *G. mondica*, *G. persica* and *G. rufa*, all of which have a well developed mental disc.

87. *Garra lorestanensis* Mousavi-Sabet & Eagderi, 2016*

Garra lorestanensis Mousavi-Sabet [H.] & Eagderi [S.] 2016:46, figs. 1-4, 8a, 9a, 9b [FishTaxa v. 1].

EN: Blind cave garra

Type locality: Iran, Lorestan province. Loven Cave, the Tigris River drainage, the Persian Gulf basin.

Distribution: The Loven Cave, the natural outlet of a subterranean limestone system of the Zagros Mountains in the Ab-e Sirum or Ab-e Serum Valley near Tang-e Haft railway station, the Tigris River drainage, the Persian Gulf basin, Lorestan Province, southwestern Iran.

IUCN: Not Evaluated but suggested to be considered as Vulnerable.

88. *Garra mondica* Sayyadzadeh, Esmaeili & Freyhof, 2015*

Garra mandica Sayyadzadeh [G.], Esmaeili [H.R.] & Freyhof [J.] 2015:78, figs. 2-6 [Zootaxa 4048 (no. 1)].

EN: Mond garra.

Type locality: Iran: Fars prov. Konar Siyah spring at Firuzabd, 28°43'40"N 52°25'20"E; Holotype: ZM-CBSU H1032, 66 mm SL.

Distribution: Mond River drainage, Persis.

IUCN: Not Evaluated but suggested to be considered as Least Concern.

89. *Garra nudiventris* (Berg, 1905)*

Discognathus rossicus var. *nudiventris* Berg [L. S.] 1905:52 [Izviestii Turkestanskago otdiela Russkago geograficheskago obschestva v. 4].

EN: Lut garra.

Type locality: Shivar [Seistan / Southern Baluchistan], north-east Kerman, Persia.

Distribution: Lut drainage basin at Kalat-e Baba Qanat.

IUCN: Not Evaluated.

90. *Garra persica* Berg, 1913*

Garra persica Berg [L.S.] 1914:61 [Ezhegodnik. Zoologicheskogo Muzeya Akademii Nauk SSSR. v. 18].

EN: Persian garra.

Type locality: Bampur River, southern Iran; Kiabad in Zirkuh, eastern Khorassan according to Berg (1913).

Distribution: Hormuz, Makran and Hamun-e Jaz Murian.

IUCN: Not Evaluated but suggested to be considered as Least Concern.

91. *Garra rossica* (Nikol'skii, 1900)

Discognathus rossicus Nikolskii [A.M.] 1900:239 [Ezhegodnik. Zoologicheskogo Muzeya Akademii Nauk SSSR. v. 5].

EN: Hari garra.

Type locality: Hari River, Turkmenistan; rivers in eastern Iran.

Distribution: Hari, Bedjestan, Sistan, Lut, Hamun-e Jaz Murian, Mashkid and Makran.

IUCN: Not Evaluated but suggested to be considered as Least Concern.

92. *Garra rufa* (Heckel, 1843)

Discognathus rufus Heckel [J.J.] 1843:1071 [81] [Ichthyologie [von Syrien]. In Russegger v. 1 (pt 2)].

EN: The common garra, Red garra.

Type locality: The types of *Discognathus rufus* are from "Aleppo, Syria" according to Heckel (1843b).

Distribution: Tigris, Maharlu and Persis (Figs. 29, 30).

IUCN: Least Concern.

Comment: *Discognathus crenulatus* was described by Heckel (1849) from the area of Shiraz, "Confluenten des Araxes, als aus den Quellen des Saadi und dem Kara-Agatsch [Confluence of Araxes River as well as from the springs of Saadi and from Kara-Agatsch]". The "Confluence of Araxes River belongs to the Kor drainage, the "springs of Saadi belong to the Lake Mahalo basin and the "Kara-Agatsch belongs to the Mond River drainage. Coad (1991) treated *D. crenulatus* as a synonym of *G. rufa* while Bianco & Banarescu (1982) considered it as a subspecies of *G. rufa*. JF examined syntypes of *D. crenulatus* at NRM (NMW 53236–37). All fishes have the breast and belly as well as the pre-dorsal midline fully covered by scales. No difference of the syntypes of *D. crenulatus* and *G. rufa* could be found. Moreover, based on Sayyadzadeh et al. (2015a) *Garra* specimens from the Iranian Lake Maharlu basin and the Mond River drainage, two of the syntype localities of *Discognathus crenulatus*, are nested within *G. rufa*. Therefore, we follow Coad (1991) and Sayyadzadeh et al. (2015a) and treat *D. crenulatus* as a synonym of *G. rufa*.



Fig. 29. *Garra rufa*, Mond River, Persis, Persian Gulf basin (H.R. Esmaeili).



Fig. 30. Qanat, an old water system acting as refuge for more than 5000 years in Iran for several fish species including *Garra rufa* (H.R. Esmaeili).

93. *Garra tashanensis* Mousavi-Sabet, Vatandoust, Fatemi & Eagderi, 2016*
Garra tashanensis Mousavi-Sabet [H.], Vatandoust [S.], Fatemi [Y.] & Eagderi [S.] 2016:135, figs. 2-6, 10, 14B [FishTaxa v. 1 (no. 3).

EN: Tashan blind cave garra.

Type locality: Tashan Cave, Tigris River drainage, Persian Gulf basin, Khuzestan Province, Iran, 30°51'91"N, 50°10'49"E, elevation 490 meters.

Distribution: Subterranean waters in the Tigris drainage.

IUCN: Not Evaluated but suggested to be considered as Vulnerable.

94. *Garra typhlops* (Bruun & Kaiser, 1944)*
Iranocypris typhlops Bruun [A.F.] & Kaiser [E.W.] 1944:5, Pl. 1 (figs. 1-4) [Danish Scientific Investigations in Iran (Copenhagen) Part 4.

EN: Discless blind cave garra.

Type locality: A flood resurgence at Kaaje-Ru, valley of Ab-i-Serum, Lorestan Province, Zagros Mountains, Iran, 33°05'N, 48°36'E.

Distribution: Subterranean waters in the Tigris drainage.

IUCN: Not Evaluated but suggested to be considered as Vulnerable.

Comment: Hashemzadeh Segherloo et al. (2012) found these two forms had a mean genetic distance, based on DNA evidence, higher than intraspecific divergence. They thought the two forms could represent separate species, with an affinity to the genus *Garra*. Phylogenetic relationships of this taxon was provided by Hashemzadeh Segherloo et al. (2016). They treat the genera *Hemigrammocapoeta*, *Typhlogarra* and *Iranocypris* as synonyms to *Garra*.

95. *Garra variabilis* (Heckel, 1843)

Discognathus variabilis Heckel [J. J.] 1843:1069 [79] [Ichthyologie [von Syrien]. In Russeger v. 1 (pt 2).

EN: Small-mouth garra.

Type locality: Heckel (1843b) gives the type localities as "Mossul" and "Aleppo" (Tigris River basin).

Distribution: Tigris.

IUCN: Least Concern.

Comment: Needs confirmation by specimens for Iran.

96. *Garra* sp.*

Comment: Based on the molecular data provided by Sayyadzadeh et al. (2015a) and Esmaeili et al. (2016c), Kol River population might be a distinct species.

Genus *Gobio* Cuvier, 1816 (1 species)

Gobio Cuvier [G.] 1816:193. Masc. *Cyprinus gobio* Linnaeus, 1758. Type by monotypy (also by absolute tautonymy). *Gobio* Walbaum (ex Klein) 1792 would preoccupy but is not admissible.

Etymology: *Gobio*: Latin, gobius = gudgeon.

97. *Gobio nigrescens* (Keyserling, 1861):

Bungia nigrescens Keyserling [E. Von] 1861:19 [22], Pl. 8 [Zeitschrift für die Gesamten Naturwissenschaften v. 17 (no. 1).

EN: Hari gudgeon.

Type locality: Harirud River at Herat, Afghanistan. No types saved.

Distribution: Hari River in Afghanistan, Iran and Turkmenistan.

IUCN: Not Evaluated.

Comment: Formerly the Harirud River population was considered as *Gobio lepidolaemus* Kessler, 1872.

Genus *Hemiculter* Bleeker, 1859 (1 species)

Hemiculter Bleeker [P.] 1860:432. Masc. *Culter leucisculus* Basilewsky, 1855. Type by subsequent monotypy. Apparently appeared first in key, without included species. One species included by Bleeker 1860:282, 401.

Etymology: *Hemiculter*: Greek, hemis = the half + Latin, culter = knife.

98. *Hemiculter leucisculus* (Basilewsky, 1855)**

Culter leucisculus Basilewsky [S.] 1855:238 [Nouveaux mémoires de la Société impériale des naturalistes de Moscou v. 10.

EN: Sharpbelly.

Type locality: *Culter leucisculus* was originally described from rivers flowing into Bay of Tschili [Chihli], Beijing [Peking], China.

Distribution: Introduced to the Caspian Sea basin; probably elsewhere in Iran including Urmia Lake and Tigris River basins (Esmaeili et al. 2014a,b; Zareian et al. 2015). IUCN: Least Concern in its native range.

Comment: *Hemiculter eigenmanni* (Jordan & Metz, 1913) is a synonym.

Genus *Hypophthalmichthys* Bleeker, 1859 (2 species)

Hypophthalmichthys Bleeker [P.] 1860:433. Masc. *Leuciscus molitrix* Valenciennes 1844. Type by subsequent designation. Apparently appeared first in key, without included species.

Etymology: *Hypophthalmichthys*: Greek, hypo = under + Greek, ophthalmos = eye + Greek,

ichthys = fish; *molitrix*: *molitrix*, approximately grinder (referring to the pharyngeal grinding apparatus).

99. *Hypophthalmichthys molitrix* (Valenciennes, 1844)**

Leuciscus molitrix Valenciennes [A.] in Cuvier & Valenciennes 1844:360 [Histoire naturelle des poissons v. 17]. No types known.

EN: Silver carp.

Type locality: China.

Distribution: Introduced to Caspian reservoirs and throughout Iran.

IUCN: Near Threatened (native populations).

100. *Hypophthalmichthys nobilis* (Richardson, 1844)**

Leuciscus nobilis Richardson [J.] (ex Gray) 1845:140, Pl. 63 (fig. 3) [Ichthyology.-Part 3. The zoology of the voyage of H. M. S. Sulphur.

EN: Bighead carp.

Type locality: Canton, China.

Distribution: Introduced to Caspian reservoirs and throughout Iran.

IUCN: Data Deficient (native populations).

Genus *Leucaspius* Heckel & Kner, 1858 (1 species)

Leucaspius Heckel [J.J.] & Kner [R.] 1857:145. Masc. *Leucaspius abruptus* Heckel & Kner, 1857. Type by monotypy. Misspelled *Leucaspis* by Jordan 1923:141.

101. *Leucaspius delineatus* (Heckel, 1843)

Squalius delineatus Heckel [J. J.] 1843:1041 [51] [Ichthyologie [von Syrien]. In Russeger v. 1 (pt 2).

EN: Moderlieschen.

Type locality: *Squalius delineatus* was described from Marchfelds near Vienna and Mähren, Austria.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Comment: *Squalius delineatus* was originally described from Wien and Mähren, Austria. The Caspian Sea basin taxon is given by Berg (1948-1949) as *Leucaspius*

delineatus delineatus natio caucasicus Berg, 1949, described from Transcaucasia, which is distinguished by a lower average dorsal fin branched ray count (7-8 rather than 8 or rarely 9 for the typical form of Europe). This natio has no taxonomic standing but has been applied as a subspecies by some authors (Arnold & Längert 1995).

Genus *Leuciscus* Cuvier, 1816 (3 species)

Leuciscus Cuvier [G.] (ex Klein) 1816:194. Masc. *Cyprinus leuciscus* Linnaeus, 1758. Type by absolute tautonymy. Appeared first in Klein 1775, unavailable.

Etymology: *Leuciscus*: Greek, leykiskos = white mullet.

Comment: Both *Aspius* species are placed in *Leuciscus* by Perea et al. (2010) on molecular evidence which contradicts morphology. Further study is needed.

102. *Leuciscus aspius* (Linnaeus, 1758)

Cyprinus aspius Linnaeus [C.] 1758:325 [Systema Naturae, Ed. X v. 1.

EN: Asp, European asp.

Type locality: *Cyprinus aspius* L., 1758 was originally was described from Swedish lakes. No types known. Neotype is designated by Fricke (1999).

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

Comment: *Leuciscus aspius taeniatus* (Eichwald, 1831) from the Southern Caspian Sea has been considered as a subspecies by some authors (see Coad 2017).

103. *Leuciscus latus* (Keyserling, 1861)

Squalius latus Keyserling [E. Von] 1861:21 [24], Pl. 9 [Zeitschrift für die Gesamten Naturwissenschaften v. 17 (no. 1).

EN: Hari asp, Esatern asp.

Type locality: *Squalius latus* was originally described from the Hari-Rud, Herat, Afqanistan.

Distribution: Tedzhen (Hari) River basin.

IUCN: Not Evaluated.

104. *Leuciscus vorax* (Heckel, 1843)

Aspius vorax Heckel [J.J.] 1843:1081 [91] [Ichthyologie [von Syrien]. In Russegger v. 1 (pt 2).

EN: Mesopotamian asp.

Type locality: *Aspius vorax* Heckel, 1843 was described from Tigris River near Mosul, Iraq.

Distribution: Tigris.

IUCN: Least Concern.

Genus *Luciobarbus* Heckel, 1843 (10 species)

Luciobarbus Heckel [J.J.] 1843:1019, 1054.

Masc. *Luciobarbus esocinus* Heckel, 1843.

Type by subsequent designation. Earliest designation located is Jordan 1919:211.

Eymology: *Luciobarbus*: Latin, Lucius = pike, barbus = barbel.

105. *Luciobarbus barbulus* (Heckel, 1849)

Barbus barbulus Heckel [J.J.] 1847:256 [Reisen in Europa, Asien und Africa v. 2 (pt 3)].

EN: Qarah Aqaj barbel.

Type locality: *Barbus barbulus* was originally described from Kara Agatsch River (a tributary of Mond), possibly near Kereft, 29°01'N, 52°52'E), Iran.

Distribution: Helleh, Mond (Persis) and Tigris.

IUCN: Not Evaluated. However, it might be considered as Least Concern due to its wide distribution range.

106. *Luciobarbus brachycephalus* (Kessler, 1872)

Barbus brachycephalus Kessler [K.F.] 1872: 52 [8], Pl. 7 (figs. 9-11) [Izvestiia Imperatorskago Obschestva Liubiteli Estestvozaniia, Antropologii i Etnografii v. 10 (no. 1).

EN: Aral barbel.

Type locality: *Barbus brachycephalus* Kessler, 1872 was originally described from Syr-Darya River, central Asia.

Distribution: Southern Caspian Sea basin.

IUCN: Vulnerable.

Comment: The subspecies *Barbus brachycephalus caspius* Berg, 1914 has been

regarded as a synonym but a valid subspecies (Bogutskaya & Naseka 2004) or a distinct species in the Caspian Sea (Fricke et al. (2007). Here, we follow Eschmeyer et al. (2017). Further study is needed.

107. *Luciobarbus capito* (Güldenstaedt, 1773)

Cyprinus capito Güldenstädt [J.A. von] 1773:519, 520 [Novi Commentarii Academiae Scientiarum Imperialis Petropolitanae v. 17 (for 1772).

EN: Bulatmai barbel.

Type locality: *Cyprinus capito* Güldenstaedt, 1773 was originally described from Kura River, Transcaucasia. No types known.

Distribution: Western Caspian Sea basin.

IUCN: Vulnerable.

108. *Luciobarbus caspius* (Berg, 1914)

Barbus brachycephalus caspius Berg [L. S.] 1914:612, fig. 119.

EN: Caspian barbel.

Type locality: *Barbus brachycephalus caspius* was originally described from Caspian Sea basin.

IUCN: Not Evaluated.

Comment: The subspecies *Barbus brachycephalus caspius* Berg, 1914 has been regarded as a synonym of *Luciobarbus brachycephalus* (Kessler 1872), but a valid subspecies (Bogutskaya & Naseka 2004:49, Esmaeili et al. 2010a:370) or a distinct species of *Luciobarbus caspius* (Fricke et al. 2007:42, Jouladeh-Roudbar et al. 2015:875). It is considered as *Luciobarbus caspius* in Catalog of Fishes (2017). Here, we follow Eschmeyer et al. (2017). Further study is needed.

109. *Luciobarbus esocinus* Heckel, 1843

Luciobarbus esocinus Heckel [J.J.] 1843:1054 [64] [Ichthyologie [von Syrien]. In Russegger v. 1 (pt 2).

EN: Pike barbel.

Type locality: Tigris River, Mosul, Iraq.

Distribution: Tigris.

IUCN: Vulnerable.

110. *Luciobarbus kersin* (Heckel, 1843)
Barbus kersin Heckel [J. J.] 1843:1049 [59]
 [Ichthyologie [von Syrien]. In Russegger v. 1 (pt 2).
 EN: Berzem, Kersin barbel.
 Type locality: Syria.
 Distribution: Tigris.
 IUCN: Data Deficient. It is available in very low number in Shadegan (Jarrahi River), Hor Al-Azim (Hor Al-Hoveyzeh) wetlands (Karkheh River) and the Karun and Zohreh Rivers.

111. *Luciobarbus mursa* (Güldenstaedt, 1773):
Cyprinus mursa Güldenstädt [J.A. von] 1773:513, Pl. 9 [Novi Commentarii Academiae Scientiarum Imperialis Petropolitanae v. 17 (for 1772).
 EN: Mursa.
 Type locality: *Cyprinus mursa* Güldenstaedt, 1773 was originally described from Kura River at Tiflis [= Tbilisi], Transcaucasia.
 Distribution: Caspian Sea and Lake Urmia basins.
 IUCN: Least Concern.

112. *Luciobarbus pectoralis* (Heckel, 1843)
Barbus pectoralis Heckel [J. J.] 1843:1045 [55] [Ichthyologie [von Syrien]. In Russegger v. 1 (pt 2).
 EN: Levantine barbel.
 Type locality: *Barbus pectoralis* Heckel, 1843 was originally described from Orontes River (also known as the Assi River), Syria.
 Distribution: Tigris.
 IUCN: Least Concern.
 Comment: Under revision. This species might not be found in Iran as its main distribution range is Orontes River system in Turkey and Syria, Mediterranean watersheds of Turkey. Further study is needed.

113. *Luciobarbus subquincunciatus*

(Günther, 1868)
Barbus subquincunciatus Günther [A.] 1868:86 [Catalogue of the fishes in the British Museum v. 7.
 EN: Leopard barbel.
 Type locality: No exact locality is given.
Barbus subquincunciatus Günther, 1868 was originally described from Mesopotamia.
 Holotype (unique).
 Distribution: Tigris.
 IUCN: Critically Endangered.

114. *Luciobarbus xanthopterus* Heckel, 1843
Luciobarbus xanthopterus Heckel [J. J.] 1843:1053 [63] [Ichthyologie [von Syrien]. In Russegger v. 1 (pt 2).
 EN: Gattan.
 Type locality: Tigris River, Mosul, Iraq.
 Distribution: Tigris.
 IUCN: Vulnerable.

Genus Mesopotamichthys Karaman, 1971 (1 species)

Mesopotamichthys Karaman [M. S.] 1971:227. Masc. *Barbus sharpeyi* Günther 1874. Type by original designation (one species, two subspecies).

Etymology: *Mesopotamichthys*: Greek, mesopotamos = between two rivers; the name of the ancient Mesopotamia, between Tigris and Euphrates + Greek, ichtys = fish.

115. *Mesopotamichthys sharpeyi* (Günther, 1874)
Barbus sharpeyi Günther [A.] 1874:38 [3], Pl. 9 [Annals and Magazine of Natural History (Series 4) v. 14 (no. 79).
 EN: Binni.

Type locality: Tigris River near Baghdad, Iraq.

Distribution: Tigris and Persis.

IUCN: Vulnerable.

Genus Mylopharyngodon Peters, 1881 (1 species)

Mylopharyngodon Peters [W. (C.H.)] 1881: 925. Masc. *Leuciscus aethiops* Basilewsky, 1855. Type by monotypy.

Etymology: Mylopharyngodon: Greek, mylo =

mill + Greek, pharynx = throat + Greek, odous = teeth.

116. *Mylopharyngodon piceus* (Richardson, 1846)**

Leuciscus piceus Richardson [J.] 1846:298 [Report of the British Association for the Advancement of Science 15th meeting [1845].

EN: Black carp.

Type locality: *Leuciscus piceus* Richardson, 1846 was originally described from Canton, China. No types known.

Distribution: Introduced to the Caspian Sea basin.

IUCN: Data Deficient (native population).

Genus *Pelecus* Agassiz, 1835 (1 species)

Pelecus Agassiz [L.] 1835:39. Masc. *Cyprinus cultratus* Linnaeus, 1758.

Etymology: *Pelecus*: Greek, pelekys = hatchet.

117. *Pelecus cultratus* (Linnaeus, 1758)

Cyprinus cultratus Linnaeus [C.] 1758:326 [Systema Naturae, Ed. X v. 1.

EN: Ziege (Fig. 31).

Type locality: Helgeån River, Sweden. Holotype (unique).

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Comment: The subspecies *Pelecus cultratus kurensis* Smirnov, 1941 was described from Kura River basin.



Fig. 31. *Pelecus cultratus*, Caspian Sea (K. Abbasi).

Genus *Petroleuciscus* Bogutskaya, 2002 (2 species)

Petroleuciscus Bogutskaya [N.G.] 2002:236. Masc. *Squalius borysthenicus* Kessler, 1859.

Type by original designation.

Comment. Under revision. It has been considered as valid genus by Bogutskaya & Naseka (2004:86), Kottelat & Freyhof (2007:154, 220), Coad & Bogutskaya (2010:37), Perea et al. (2010:3, 14). However, Parin et al. (2014:95) consider it as synonym of *Squalius* Bonaparte, 1837.

Etymology: *Petroleuciscus*: Named for Petru Bănărescu, a famous freshwater ichthyologist and Petr Naseka, son of the genus author, and *Leuciscus*, a related genus. Perea et al. (2010)

used mitochondrial and nuclear DNA and concluded that *Petroleuciscus* is not monophyletic. According to Teimori et al. (2015b), the European *Petroleuciscus* species are sister group to the genus *Squalius*. *Petroleuciscus* might be not valid generic name for the Iranian species. Further study is needed.

118. *Petroleuciscus esfahani* Coad & Bogutskaya, 2010*

Petroleuciscus esfahani Coad [B.W.] & Bogutskaya [N.G.] 2010:38, figs. 1, 2, 3a [Zootaxa No. 2534].

EN: Esfahan chub.

Type locality: Esfahan, stream at Dizaj in the southern Zayandeh River drainage, 31°55'N, 51°30'E, central Iran.

Distribution: Esfahan basin.

IUCN: Not Evaluated.

Comment: *Petroleuciscus* might be not valid generic name for the Iranian species. Further study is needed.

119. *Petroleuciscus ulanus* (Günther, 1899)*
Leuciscus ulanus Günther [A.] 1899:387, Pl. 24 (fig. A) [The Journal of the Linnean Society of London. Zoology v. 27 (no. 177)].
EN: Urmia chub.

Type locality: *Leuciscus ulanus*, was originally described from Ula on the Zola Chai, northwestern Iran.

Distribution: Lake Urmia basin.

IUCN: Not Evaluated.

Comment: *Leuciscus gaderanus* Günther, 1899 from Iran (Gader Chai, near Ocksa, northwestern Iran; near mouth of Nazlu Chai at Superghan, Iran) is a synonym. Comment: *Petroleuciscus* might be not valid generic name for the Iranian species. Further study is needed.

Genus *Pimephales* Rafinesque, 1820 (1 species)

Pimephales Rafinesque [C.S.] 1820:242. Masc.
Pimephales promelas Rafinesque, 1820. Type by monotypy. Also appeared in Rafinesque 1820:52 (Dec.); Rafinesque states name is from "*Pimelecephales*"; *Pimelocephales* Meek 1904:50 is an unjustified emendation of *Pimephales*.

Etymology: *Pimephales*: Greek, pimeles, -es = fat + Greek, phales = whale; if the root is Greek, phales, -etos = penis.

120. *Pimephales promelas* Rafinesque, 1820**

Pimephales promelas Rafinesque [C.S.] 1820:299 [Western Revue and Miscellaneous Magazine: a monthly publ., devoted to literature and science, Lexington, KY v. 2 (no. 5)].

EN: Fathead minnow.

Type locality: Pond, near Lexington, Kentucky, U.S.A. Holotype (unique)

Distribution: Introduced to the Namak Lake

basin.

IUCN: Least Concern (native population).

Comment: This species was reported from a reservoir, probably the Yengi Kand where bass (*Micropterus salmoides*) and bluegills (*Lepomis macrochirus*) were introduced, south of Tehran at 75 km from Asia-beg (Andersskog 1970) (presumably Asia Bak at 35°19'N, 50°30'E on the Tehran-Esfahan highway). The MMTT catalogue also has a record for the "Dusadj Reservoir", 90km west of Saveh, presumably in Markazi Province and the Namak Lake basin too. These reservoirs may be the same locality as "Dusadj" or Duzaj, Yang-e Kand and Yanguikand are all villages in the same general area west of Saveh. The reservoir is deduced from maps to be at about 35°19'N, 49°55'E (Coad 2017). No recent report of this fish is available.

Genus *Pseudorasbora* Bleeker, 1859 (1 species)

Pseudorasbora Bleeker [P.] 1859:261. Fem.
Leuciscus pusillus Temminck & Schlegel, 1846. Type by subsequent monotypy. Appeared first in key, without species; one species (*pusillus*) included by Bleeker 1860:261 and 1860:2, 97. Type apparently not *Leuciscus parvus* Temminck & Schlegel as designated by Bleeker 1863:212 and 1863:32, although months of publication for pertinent Bleeker papers are not well established.

Etymology: *Pseudorasbora*: Greek, pseudēs = false + *Rasbora*, an Indian word for a fish, also used in Malay peninsula.

121. *Pseudorasbora parva* (Temminck & Schlegel, 1846)**

Leuciscus parvus Temminck [C.J.] & Schlegel [H.] 1846:215, Pl. 102 (figs. 3, 3a-b) [Fauna Japonica Parts 10-14].

EN: Topmouth gudgeon.

Type locality: *Leuciscus parvus* Temminck & Schlegel, 1846 was originally described from Japan.

Distribution: Introduced to the Caspian Sea, Namak Lake, Hari River, Sistan, Maharlu,

Urmia, Persis and Tigris River drainages and probably elsewhere (Esmaeili et al. 2014a).
IUCN: Least Concern.

Genus *Rhodeus* Agassiz, 1832 (1 species)

Rhodeus Agassiz [L.] 1832:134. Masc. *Cyprinus amarus* Bloch, 1782. Type by monotypy. Also in Agassiz 1835:37.

Etymology: *Rhodeus*: Greek, rhodeos, a,-on = rose.

122. *Rhodeus amarus* (Bloch, 1782)

Cyprinus amarus Bloch [M.E.] 1782:52, Pl. 8 (fig. 3) [M. Marcus Elieser Bloch's, ausübenden Arztes zu Berlin, Oeconomische Naturgeschichte der Fische Deutschlands v. 1].

EN: European bitterling.

Type locality: Müggelsee (lake) near Köpenick, Berlin, Germany.

Distribution: The Caspian Sea basin, introduced to the Urmia Lake and Tigris basins (Esmaeili et al. 2011b; Eagderi & Nasri 2012).

IUCN: Least Concern.

Comment: Formerly identified as *Rhodeus sericeus* (Pallas, 1776). Naseka & Bogutskaya (2009) refer to the Caspian Sea taxon as *Rhodeus* sp. Further study is needed.

Genus *Romanogobio* Bănărescu, 1961 (2 species)

Romanogobio (subgenus of *Gobio*) Bănărescu [P.M.] 1961: 332. Masc. *Gobio kesslerii* Dybowski, 1862. Type by original designation. Also in Bănărescu 1962.

Etymology: *Romano*: Roman+*gobio*: Latin, gobius= gudgeon.

123. *Romanogobio macropterus* (Kamensky, 1901):

Gobio macropterus Kamensky [S.N.] 1901: 10 [German p. 146] [Die Cypriniden der Kaukasusländer und ihrer angrenzenden Meere. 2.

EN: South Caucasian gudgeon.

Type locality: Caucasus.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

124. *Romanogobio persus* (Günther, 1899)*

Gobio persa Günther [A.] 1899:386, Pl. 23 (fig. B) [The Journal of the Linnean Society of London. Zoology v. 27 (no. 177).

EN: Persian gudgeon (Fig. 32).

Type locality: Gader Chai, Urmia basin, northwestern Iran.

Distribution: Lake Urmia basin.

IUCN: Not Evaluated. However, it is restricted to few localities in the Lake Urmian basin with low number.

Comment: Formerly in the genus *Gobio*. Considered by some as a subspecies of *R. macropterus*. Naseka & Freyhof (2004) recognise this taxon as a distinct species.



Fig. 32. *Romanogobio persus*, Mahabad Chai, Lake Urmia basin (K. Abbasi).

Genus *Rutilus* Rafinesque, 1820 (2 species)

Rutilus Rafinesque [C.S.] 1820:240. Masc.

Cyprinus rutilus Linnaeus, 1758. Type by original designation (also by absolute

tautonymy). Also appeared in Rafinesque 1820:50 (Dec.).

Etymology: *Rutilus*: Latin, rutilus = reddish.

Comment: Caspian Sea populations need further study.

125. *Rutilus caspicus* (Yakovlev, 1870)

Leuciscus rutilus caspicus var. Yakovlev [V. E.] 1870:103 [3], fig. 2 [On the new and little-known species of fish found in the mouths of the Volga.

EN: Caspian Roach, Vobla.

Type locality: *Leuciscus rutilus caspicus* Yakovlev, 1870 was originally described from Volga River delta, Russia.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Comment: It has been considered as a valid species by Kottelat & Freyhof (2007:239), Esmaeili et al. (2010a:371) and Jouladeh-Roudbar et al. (2015b:879). *Rutilus caspicus* is recognised as the Caspian Sea resident species and *R. rutilus* as the freshwater species (Bogutskaya & Naseka 2004, Kottelat & Freyhof 2007).

126. *Rutilus kutum* Kamenskii, 1901

Leuciscus frisii kutum var. Kamensky [S. N.] 1901:23 [German p. 154], Pl. 12 [Die Cypriniden der Kaukasusländer und ihrer angrenzenden Meere. 2.

EN: Kutum.

Type locality: Southern Caspian Sea and tributaries.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

Comment: *Leuciscus frisii kutum* Kamenskii, 1901 was originally described from Southern Caspian Sea and its tributaries. Bogutskaya & Iliadou (2006:294), Fricke et al. (2007:46), Naseka & Bogutskaya (2009), Esmaeili et al. (2010a:371) and Jouladeh-Roudbar et al. (2015b:879) regard *Rutilus kutum* Kamenskii, 1901 as a distinct species. It has been considered as *Rutilus frisii* (Nordmann, 1840), but a valid subspecies by Coad (1995:20) and Parin et al. (2014:91). It

seems that some populations from the Caspian and Black Sea basins have the same genetic characteristics. Hence, *Rutilus frisii* (Nordmann, 1840) might be the valid name for the Caspian Sea population.

Genus *Scardinius* Bonaparte, 1837 (1 species)

Scardinius (subgenus of *Leuciscus*) Bonaparte [C.L.] 1837: punctata 96. Masc. *Leuciscus scardafa* Bonaparte, 1837. Type by original designation. Apparently appeared first in punctata 96, fasc. 19 under *Leuciscus scardafa* [species misspelled once as *scarpata*].

Etymology: *Scardinius*: A range of lofty mountains, Scardus, forming the boundary between Moesia and Macedonia.

127. *Scardinius erythrophthalmus* (Linnaeus, 1758)

Cyprinus erythrophthalmus Linnaeus [C.] 1758:324 [Systema Naturae, Ed. X v. 1] Spelled *erythropthalmus* by Bonnaterre 1788:199.

EN: Rudd, redeye, redfin, pearl roach.

Type locality: *Cyprinus erythrophthalmus* Linnaeus, 1758 was originally described from northern Europe. No types known.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Genus *Schizocypris* Regan, 1914 (1 species)

Schizocypris Regan [C. T.] 1914:262. Fem. *Schizocypris brucei* Regan, 1914. Type by monotypy.

Etymology: *Schizocypris*: Greek, schizein = to divide + Greek, kypris = other name for Aphrodite, proceeding from Kypris (Cyprus) Greek, kyprinos = carp.

128. *Schizocypris altidorsalis* Bianco & Bănărescu, 1982

Schizocypris altidorsalis Bianco [P. G.] & Bănărescu [P. M.] 1982:93, fig. 1D [Cybium 3e série. Bulletin de la Société Française d'Ichtyologie v. 6 (no. 2).

EN: Gorgak.

Type locality: Nahr-Taheri, near Zabol, Sistan, Iran, about 31°02'N, 61°30'E.

Distribution: Sistan basin.

IUCN: Least Concern.

Comment: Formerly identified as *S. brucei* Regan, 1914.

Genus *Schizopygopsis* Steindachner, 1866 (1 species)

Schizopygopsis Steindachner [F.] 1866:785. Fem. *Schizopygopsis stoliczkai* Steindachner, 1866. Type by monotypy.

Etymology: *Schizopygopsis*: Greek, schizein = to divide + Greek, pyge = tail + Greek, ophis = appearance.

129. *Schizopygopsis stoliczkai* Steindachner, 1866:

Schizopygopsis stoliczkai Steindachner [F.] 1866:786, Pl. 16 (fig. 2) [Verhandlungen der K.-K. zoologisch-botanischen Gesellschaft in Wien v. 16.

EN: False Osman.

Type locality: The type locality of this species is a stream near Hanle Monastery, Ladakh, India.

Distribution: Sistan basin.

IUCN: Not Evaluated.

Genus *Schizothorax* Heckel, 1838 (3 species)

Schizothorax Heckel [J. J.] 1838:11. Masc. *Schizothorax esocinus* Heckel, 1838. Type by subsequent designation. According to Kullander et al. 1999:113, the type of *Schizothorax* is *Schizothorax esocinus* and the type of *Oreinus* is *Schizothorax plagiostomus* as designated by McClelland 1842; this is an important change and needs more study. Type as *plagiostomus* apparently first designated by Bleeker 1863:196, 1863:26 and 1863:262, not *cavifrons* designated by Günther 1868.

Etymology: *Schizothorax*: Greek, schizein = to divide * Greek, thorax = breast.

130. *Schizothorax intermedius* McClelland & Griffith 1842

Schizothorax intermedius McClelland [J.] & Griffith [W.] in McClelland 1842:579, Pl. 12 (fig. 1) [Calcutta Journal of Natural History v. 2 (no. 8).

EN: Common marinka.

Type locality: *Schizothorax intermedius* was described from the "Cabul River at Jullalabad. Tarnuck River" in the Indus River basin.

Distribution: Sistan basin.

IUCN: Not Evaluated.

Comment: *Schizothorax schumacheri* Fowler & Steinitz, 1956 is an Iranian synonym.

131. *Schizothorax pelzami* Kessler, 1870

Schizothorax pelzami Kessler [K. F.] 1870:320, Pl. 3 (figs. 1-3) [Trudy St.-Peterburgskogo Obscestva Estestvoispytatelej = Travaux de la Société des Naturalistes de St. Pétersbourg. v. 1.

EN: Transcaspian Marinka.

Type locality: Shah-rud River, northeastern Iran.

Distribution: Hari River and Kavir basins.

IUCN: Least Concern.

Comment: *Schizothorax pelzami iranicus* Karaman, 1969 is a synonym.

132. *Schizothorax zarudnyi* (Nikol'skii, 1897)

Aspiostoma zarudnyi Nikolskii [A. M.] 1897:346 [Ezhegodnik. Zoologicheskogo Muzeya Akademii Nauk SSSR. v. 1.

EN: Sistan Marinka.

Type locality: Berg (1949) gives the collection locality as "Neizar near the southern tip of Lake Hamun-i-Farah, western edge of the Helmand delta in northwestern Seistan" based on Zarudnyi (1901).

Distribution: Sistan basin.

IUCN: Not Evaluated.

Comment: *Oreinus anjac* Fowler & Steinitz, 1956 from Zabol, 31°02'N, 61°30'E, eastern Iran is a synonym.

Genus *Squalius* Bonaparte, 1837 (4 species)

Squalius (subgenus of *Leuciscus*) Bonaparte [C.L.] 1837: fasc.19. Masc. *Leuciscus squalus* Bonaparte, 1837. Type by subsequent designation. Occurred in puntata 96, fasc. 19

under *Leuciscus squalus* and two additional species; also in later fascicles. Type evidently designated first by Jordan 1919:187.

133. *Squalius berak* Heckel, 1843
Squalius berak, Heckel [J.J.] 1843:1078 [88] [Ichthyologie [von Syrien]. In Russegger v. 1.
 EN: Mesopotamian chub.
 Type Locality: Aleppo, Syria.
 Distribution: Tigris (Esmaeili et al. 2016a, Khaefi et al. 2016).
 IUCN: Least Concern.

134. *Squalius lepidus* Heckel, 1843
Squalius lepidus Heckel [J.J.] 1843:1079 [89] [Ichthyologie [von Syrien]. In Russegger v. 1.
 EN: Mesopotamian pike chub.
 Type locality: Tigris River, Mosul, Iraq.
 Distribution: Tigris (Khaefi et al. 2016).
 IUCN: Least Concern.

135. *Squalius namak* Khaefi, Esmaeili, Sayyadzadeh, Geiger & Freyhof, 2016*
Squalius namak Khaefi [R.], Esmaeili [H. R.], Sayyadzadeh [G.], Geiger [M.F.] & Freyhof [J.] 2016:148, Figs. 2-4, 5c, 6, 9 [Zootaxa 4169 (no. 1)].
 EN: Namak Lake chub.
 Type locality: Iran: Markazi prov.: spring Bolagh (Cheshmeh Bolagh) at Shazand, east of Anjirak, 34°00'38"N 49°50'51"E.
 Distribution: Namak basin.
 IUCN: Not Evaluated.

136. *Squalius turcicus* De Filippi, 1865
Squalius turcicus De Filippi [F.] 1865:359 [Note di un viaggio in Persia nel 1862].
 EN: Transcaucasian chub.
 Type locality: River Arax [Aras Nehri] near Erzurum, Turkey.
 Distribution: Urmia Lake and southern Caspian Sea basin.
 IUCN: Least Concern.

Comment: Naseka & Bogutskaya (2009) identified the *Squalius* populations of the southern Caspian Sea basin as *S. orientalis*.

Squalius orientalis was described from Abkhazia (Berg 1949), which is situated between Georgia and Russia, in the easternmost Black Sea basin. *Squalius orientalis* is treated as a valid species by Stoumboudi et al. (2006), Doadrio & Carmona (2004) and Turan et al. (2009, 2013), without discussing in detail how it is distinguished from *S. cephalus*. Özuluğ & Freyhof (2011) discussed the case and kept *S. orientalis* as a synonym of *S. cephalus* based on the lack of studies of the morphological characters distinguishing *S. orientalis* from *S. cephalus*. Khaefi et al. (2016) include COI sequences of *S. orientalis* from Georgia and Turkey. These fishes are very close to *S. turcicus*, a species described from the upper Arax River in Turkey by De Filippi (1865). Özuluğ & Freyhof (2011) suggested that *S. turcicus* might be a valid species occurring in the southern Caspian Sea basin and Turan et al. (2013) supported this view and provided some morphological data distinguishing this species from *S. orientalis*. Khaefi et al. (2016) suggest that *S. orientalis* and *S. turcicus* are very closely related and might represent just one species (*S. orientalis*). *Squalius turcicus* might be more widespread and *Squalius* populations from the Lake Urmia basin, as well as those from the Iranian Sefid River and from the Iranian Talar River (flowing to the Caspian Sea at Bahnamir), might belong to this species. More and geographically focused studies are needed to better understand the distribution of *S. turcicus* in the rivers of the southern Caspian Sea basin (Khaefi et al. 2016).

Genus *Tariqilabeo* Mirza & Saboohi, 1990 (2 species)

Tariqilabeo (subgenus of *Labeo*) Mirza [M.R.] & Saboohi [N.] 1990:405. Masc. *Labeo macmahoni* Zugmayer 1912. Type by original designation (also monotypic).

Comment: It was considered as synonym of *Labeo* Cuvier 1816, but a valid subgenus

Tariqilabeo by Mirza & Saboohi (1990:405), *Crossocheilus* Kuhl & van Hasselt, 1823 by Kottelat (2013:89) and *Gonorhynchus* McClelland, 1838 by (Ciccotto & Page 2016:472). It was treated as a valid species of *Tariqilabeo* Mirza & Saboohi, 1990 by Kottelat (2016:445). Etymology: Tariqi: a name + *Labeo*: Latin, labeo = one who has large lips.

137. *Tariqilabeo adiscus* (Annandale, 1919) *Discognathus adiscus* Annandale [N.] 1919:68, Pls. 10 (fig. 2), 11 (fig. 1) [Records of the Indian Museum (Calcutta) v. 18 (pt 1). EN: Sistan Latia.

Type locality: Nasratabad, Seistan, Iran. Distribution: Small streams and rivers of eastern Iran, draining to the Hamun wetland in the Sistan basin and also in Helmand River of Afghanistan (Sayyadzadeh et al. 2015b).

IUCN: Not Evaluated.

Comment: It was considered as valid species by (Sayyadzadeh et al. 2015:353, Jouladeh-Roudbar et al. 2015:871, Behrens-Chapuis et al. 2015:197).

138. *Tariqilabeo diplochilus* (Heckel, 1838) *Barbus diplochilus*, Heckel [J.J.] 1838:53, Pl. 10 (fig. 1) [Fische aus Caschmir]. EN: Kashmir Latia.

Type locality: Kashmir. Distribution: Qanats, streams and rivers of eastern and south eastern Iran and also in Western Pakistan in the Mashkid and the Makran basins (Sayyadzadeh et al. 2015b).

IUCN: Not Evaluated however might be considered as Least Concern.

Comment: *Gonorhynchus diplochilus* (Heckel, 1838) and *Tylognathus barbatulus* Heckel, 1844 are synonyms. The name appeared as *diplochilus* in the original description (see Heckel [J. J.] 1838:53, Pl. 10 (fig. 1) but it was spelt as *diplocheilus* in some articles.

Genus *Tinca* Cuvier, 1816 (1 species)

Tinca Garsault [F.A.P. de] 1764:406. Fem. *Cyprinus tinca* Linnaeus, 1758. Type by

absolute tautonymy. Authorship changed Apr. 2015 from Cuvier 1816 to Garsault 1764.

Etymology: *Tinca*: Latin, timica; related to a predatory fish = timi, but the etymology of tench does not conform with this meaning.

139. *Tinca* (Linnaeus, 1758)

Cyprinus tinca Linnaeus [C.] 1758:321 [Systema Naturae, Ed. X v. 1.

EN: Tench.

Type locality: *Cyprinus tinca* was described originally from European lakes. No types known.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Genus *Vimba* Fitzinger, 1873 (1 species)

Vimba Fitzinger [L.J.F.J.] 1873:152, 159. Fem. *Cyprinus vimba* Linnaeus, 1758. Type by absolute tautonymy, two included species, one *vimba*.

140. *Vimba persa* (Pallas, 1814)

Cyprinus persa Pallas [P.S.] 1814:310 [Zoographia Rosso-Asiatica v. 3.

EN: Persian vimba, Caspian vimba.

Type locality: *Cyprinus vimba* Pallas, 1814 was described originally from the southern coast of the Caspian Sea in lakes of the Kura River system in Azerbaijan. No types known.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

Comment: *Vimba persa* was the subspecies in the Caspian Sea basin but is recognised as a full species by Naseka & Bogutskaya (2009).

Family Cobitidae Fitzinger, 1832 (2 genera, 7 species)

Genus *Cobitis* Linnaeus, 1758 (4 species)

Cobitis Linnaeus [C.] 1758:303. Fem. *Cobitis taenia* Linnaeus, 1758. Type designated by the ICZN (Opinion 1500); see also Opinion 2695. *Cobites* Swainson, 1839:190, 310 is a misspelling.

Etymology: *Cobitis*: Greek, kobitis, -idos = a kind of sardine; also related with the voice Greek, kobios, Latin gobius = gudgeon.

141. *Cobitis avicennae* Mousavi-Sabet, Vatandoust, Esmaeili, Geiger & Freyhof, 2014 *: *Cobitis avicennae* Mousavi-Sabet [H.], Vatandoust [S.], Esmaeili [H. R.], Geiger [A. F.] & Freyhof [J.] 2015:562, figs. 3-7 [Zootaxa 3914 (no. 5)].

EN: Avicenna spined loach.

Type locality: Gamasiab River at Dehno, a tributary to Karkheh, Tigris, Hamedan prov., Iran.

Distribution: Tigris.

IUCN: Not Evaluated.

142. *Cobitis faridpaki* Mousavi-Sabet, Vasil'eva, Vatandoust & Vasil'ev, 2011 *: *Cobitis faridpaki* Mousavi-Sabet [H.], Vasil'eva [E. D.], Vatandoust [S.] & Vasil'ev [V. P.] 2011:928, figs. 2-4 [Journal of Ichthyology v. 51 (no. 10)].

EN: Faridpak's spine loach or Siahrud spined loach.

Type locality: Siahrud River, Mazandaran region, 36°26'85.05"N, 52°56'70.08"E, northern Iran, elevation 83 meters.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated. But it might be considered as Least Concern.

Comment: Populations from the southern Caspian Sea were previously identified as *Cobitis taenia* Linnaeus, 1758 (Systema Naturae, Ed. X v. 1, Europe). *Cobitis amphilekta* Vasil'eva & Vasil'ev, 2012 was described from the Kyzylagach Bay in Azerbaijan and the northeastern Caspian Sea, but till date has not been recorded from Iran.

Cobitis keyvani Mousavi-Sabet, Yerli, Vatandoust, Özeren & Moradkhani, 2012 which was described from the Keselian stream, Talar River, southeast of the Caspian Sea basin, Mazandaran province, north of Iran, 36°11'74.09 "N, 53°00'92.01"E" is a synonym (Jouladeh-Roudbar et al. 2017).

143. *Cobitis linea* (Heckel, 1849)*

Acanthopsis linea Heckel [J. J.] 1847:267 [Reisen in Europa, Asien und Africa v. 2 (pt 3)].

EN: Persepolis or Kor spined loach.

Type locality: The type locality of *Acanthopsis linea* is "Bäche um Persepolis " according to Heckel (1847b). Persepolis is at 29°57'N, 52°52'E in Fars, Iran.

Distribution: Kor and Hormuz.

IUCN: Not Evaluated. But it might be considered as Vulnerable.

144. *Cobitis saniae* Eagderi, Jouladeh-Roudbar, Jalili, Sayyadzadeh & Esmaeili 2017*

Cobitis saniae Eagderi [S.], Jouladeh-Roudbar [A.], Jalili [P.], Sayyadzadeh [G.] & Esmaeili [H. R.] 2017:51, figs. 2-9, 11b, 12c, 13 [FishTaxa v. 2 (no. 1)].

EN: Sania's spined loach (Figs. 33,34).

Type locality: Bara Goor River a tributary of Sefid River, near Emamzadeh Hashem, Caspian Sea basin, Guilan province, Iran, 37°00'11"N, 49°37'49"E.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.



Fig. 33. *Cobitis saniae*, Bara Goor Stream, a tributary of Sefid River, Caspian Sea basin (S. Eagderi).



Fig. 34. Natural habitat of *Cobitis saniae*, Bara Goor Stream, a tributary of Sefid River, Caspian Sea basin (S. Eagderi).

Genus *Sabanejewia* Vladykov, 1929 (3 species)

Sabanejewia Vladykov [V.D.] 1929:86. Fem. *Cobitis balcanica* Karaman, 1922. Type by original designation.

Etymology: *Sabanejewia*: Because of P. Sabanejev, expert in plankton.

Comment: Formerly in the genus *Cobitis*.

145. *Sabanejewia aurata* (De Filippi, 1863)

Cobitis aurata De Filippi [F.] 1863:391 [Archivio per la Zoologia, l'Anatomia e la Fisiologia. v. 2.

EN: Golden spined (spiny) loach.

Type locality: The type locality is possibly Sarcham-e Sofla (37°07'N, 47°54'E) in the Qezel Owzan River (a tributary of Sefidrud) drainage of the Caspian Sea basin in Iran.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

146. *Sabanejewia caspia* (Eichwald, 1838)

Cobitis caspia Eichwald [C.E. von] 1838: 133 [Bulletin de la Société Impériale des Naturalistes de Moscou v. 11.

EN: Caspian loach.

Type locality: Caspian Sea at Lenkoran, Azerbaidjan. No types known.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

147. *Sabanejewia caucasica* (Berg, 1906)

Cobitis caucasica Berg [L. S.] 1906:37, fig. [Izvestija Imperatorskoj Akademii Nauk, prodaetsja u Kommissionerov Imperatorskoj Akademii Nauk St. Petersburg. [= Bulletin de l'Academy Impériale des Sciences de St. Pétersbourg.] (Sér. 5) v. 24 (nos 1-2).

EN: Cuacasian spiny loach.

Type locality: Sagdan [Saagdan], Gr. Laba River, upper Kubun River, Russia.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Comment: Reported from the Anzali Mordab and lower reaches of the Safid, Tonekabon, Chalus, Heraz and Babol Rivers in Iran (Abdoli 2000) and mapped from the Caspian coast of Iran at Babol by Kottelat & Freyhof (2007). Formerly in the genus *Cobitis*.

Family Nemacheilidae Regan, 1911 (6 genera and 45 species, 1 unconfirmed)

Comment: Formerly included in the family Cobitidae or the family Balitoridae (see Tang et al. 2006; Kottelat & Freyhof 2007; Freyhof et al. 2011, 216; Esmaeili et al. 2014). Iranian species were placed in the genera *Nemacheilus*, *Adiposia*, *Barbatula*, *Orthrias* and *Schistura* in earlier literature.

Genus *Eidinemacheilus* Hashemzadeh Segherloo, Ghaedrahmati & Freyhof, 2016 (1 species)

Eidinemacheilus Hashemzadeh Segherloo [I.], Ghaedrahmati [N.] & Freyhof [J.] 2016:471 Masc. *Noemacheilus smithi* Greenwood Type by original designation (and monotypy).

Etymology: The generic name is made out of the name of the ranger protecting the locality "Eidi Heidari" and *Nemacheilus*, for loaches.

148. *Eidinemacheilus smithi* Greenwood, 1976*

Noemacheilus smithi Greenwood [P. H.] 1976:130, figs. 1a-c, 2 [Journal of Zoology (London) v. 180 (no. 1)].

EN: Zagros blind crested loach.

Type locality: A natural well at Kaaje-Ru, 33°05'N, 48°36'E, near Baq-e-Loveh Oasis, Zagros Mountains, Iran.

Distribution: *Eidinemacheilus smithi* is known from a well-like spring in the proximity of the Bagh-e-Levan oasis in the Sezar River drainage. The Sezar is a headwater of the Dez River. The Dez is a tributary to the Karun and the Karun flows from the Iranian Zagros Mountains westwards into the lowermost Tigris.

IUCN: Vulnerable D2.

Genus *Oxynoemacheilus* Bănărescu & Nalbant, 1967 (16 species, 1 unconfirmed)

Oxynoemacheilus (subgenus of *Noemacheilus*) Bănărescu [P.M.] & Nalbant [T.T.] 1966:153. Masc. *Cobitis persa* Heckel 1847. Type by original designation (also monotypic). Misspelled once as *Oxynolmacheilus* in Zoological Record for 1967. Correct spelling is apparently *Oxynoemacheilus* and not *Oxynemacheilus*.

Etymology: *Oxy* + *Nemacheilus*: Greek, nema, -atos = filament + Greek, cheilos = lip.

Comment: *Oxynoemacheilus angorae* (Steindachner, 1897) may be a catchall species in Iran. *Nemacheilus angorae* Steindachner [F.] 1897:693 [9], Pl. 4 (fig. 4a-c) [Denkschriften der Kaiserlichen Akademie der Wissenschaften in Wien, Mathematisch-Naturwissenschaftliche Classe. v. 64. was originally described from Tabakane-Sir and Tschibuk-Tschai, both in the vicinity of Ankara, Sakarya River drainages, Black Sea basin, Turkey. Freyhof et al. (2011) doubt that *O. angorae* s.s. occurs in the Caspian Sea basin and it may not be present in Iran at all. According to Freyhof (2016), *O. angorae* is endemic to the western and Central Anatolian Black Sea basin. If *O. angorae* is restricted to Turkey, then the species for the western Caspian might be *O. lenkoranensis*. It had been frequently reported from the Caspian Sea and Lake Urmia basins.

Oxynoemacheilus araxensis (Bănărescu & Nalbant, 1978) is another species which has been frequently reported from the Caspian Sea basin of Iran (Esmaeili et al. 2014b, Jouladeh-Roudbar et al. 2015b:883). *Orthrias angorae araxensis* Bănărescu [P. M.] & Nalbant [T. T.] in Bănărescu, Nalbant & Balik 1978:259, fig. 2; Pl. 20 (figs. 1-4) [Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut v. 75, is described from Kandili Karassu, upper Araxes basin (the Aras River basin of eastern Turkey. However, it seems that the type locality of this taxon is in the Euphrates drainage. Freyhof et al. (2011) give: *Oxynoemacheilus araxensis*: ZMH 4827,

holotype, 61.2 mm SL; ZMH 4826, paratypes, 5, 36.5–50.4 mm SL; ZMH 5951, paratypes, 4, 44.5–64.2 mm SL; Turkey: Erzurum prov.: Kandili Karassu, Euphrates drainage, about 39°91' N 40°85' E. This subspecies was formerly referred to as *Nemacheilus angorae bureschi* (Drensky, 1928) by Banarescu & Nalbant (1964) and Banarescu (1968). Nalbant & Bianco (1998), Fricke et al. (2007) and Freyhof et al. (2010, 2011) elevate this taxon to a species. According to Freyhof (2016b), *O. araxensis* is endemic to the uppermost Euphrates drainage and has never been confirmed from the territory of Iran and are unlikely to be found there in the future. Its presence in Iran needs confirmation.

Another species which might be found in the upper reaches of Aras River drainages in Iran is *Oxynoemacheilus cyri* (Berg, 1910). *Nemacheilus tigris cyri* Berg [L. S.] 1910:170 [Zoologicheskago Muzeya Imperatorskoi Akademii Nauk v. 15]; is described from the upper reaches of the Kura River (Göle depression), Caspian Sea basin, near Okam village, Ardahan Province, Turkey. Its presence in Iran needs confirmation.

Oxynoemacheilus hamwii (Krupp & Schneider 1991) is another species of interest.

Nemacheilus hamwii Krupp [F.] & Schneider [W.] 1991:24, figs. 1–5 [Senckenbergiana Biologica v. 71 (nos 1/3) was described from Nahr Afrin in Afrin, Syria, 36°31'N, 36°52'E. Holotype: SMF 17398. It has been recorded from Iran by Kamangar et al. (2014): FCFUK, uncatalogued, 10 specimens SL 41.3–62.1 mm, Gaveh-Rud River, Sirvan basin, a tributary of Tigris, Kurdistan, Iran, 34° 56' 33" N, 47° 12' 15" E, August 2011; FCFUK, uncatalogued, 3 specimens SL 37.3–42.3 mm, Razavar River, Karkheh basin, Kurdistan, Iran, 34°44'51"N, 46°51'53"E, September 2011, B.B. Kamangar, E. Ghaderi. According to Freyhof (2014) this species was known from the headwaters in the Asi drainage in Turkey and northern Syria (it is now extirpated from Syria) (Levant coastline of the Mediterranean Sea). It is now only left in the northern Asi

drainage in three streams, the Yıldırım (2–5 km), Büyük Karacay (3–5 km), and Küçük Karacay (3–5 km) flowing to the lower Asi in Turkey, and the upper Afrin (10 km) which flows into Syria. Other records are misidentifications or are thought to now be extirpated. Further study is needed to confirm its presence in Iran.

Recently, Freyhof & Abdullah (2017) described two new species of loaches, *Oxynoemacheilus gyndes* and *O. hanae*, from the headwater streams of the upper Sirwan (Kurdish) drainage [Sirvan (Persian) or Diyala (Arabic)] in Iraqi Kurdistan (Tigris) which might be available in the Sirvan tributaries in Iran too.

149. *Oxynoemacheilus argyrogramma* (Heckel, 1847)

Cobitis argyrogramma Heckel [J.J.] 1847:239, Pl. 18 (fig. 3) [Reisen in Europa, Asien und Africa v. 2 (pt 3)].

EN: Two spot loach.

Type locality: *Cobitis argyrogramma* was originally described from Aleppo, Syria.

Distribution: Tigris.

IUCN: Least Concern.

Comment: Tigris River drainages (Saadati 1977, Kamangar et al. 2014). Kamangar et al. (2014) give: *Oxynoemacheilus argyrogramma*: FCFUK, uncatalogued, 10 specimens SL 37.3–58.2 mm, Gaveh-Rud River, Sirvan basin, a tributary of Tigris, Kurdistan, Iran, 34° 56' 33" N, 47° 12' 15" E, August 2011; FCFUK, uncatalogued, 10 specimens SL 48.3–62.5 mm, Do-rud River, Sirvan basin, a tributary of Tigris, Sarvabad, Kurdistan, Iran, 35° 18' 45" N, 46° 20' 14" E, October 2011. JF examined the types of *Cobitis argyrogramma* and *Noemacheilus euphraticus* as well as photographs of the types of *N. tschaiyssuensis*, and treats *N. euphraticus* and *N. tschaiyssuensis* as synonyms of *O. argyrogramma* (see Freyhof et al. 2011), a conclusion already reached by Krupp & Schneider (1989). Later, Freyhof et al. (2016b) considered *Oxynoemacheilus euphraticus*, as a valid species. Freyhof et al.

(2016b) give *Oxynoemacheilus argyrogramma*: NMW 48541, 8 syntypes, 51–59mm SL; NMW 59913, 4 syntypes, 56–60 mm SL; Syria: Aleppo, Queik (Queiq) drainage.-BMNH 1935.9.12.57, holotype of *N. tschaiyssuensis*, 85mm SL.-BMNH 1935.9.12.58–60, 3 paratypes of *N. tschaiyssuensis*, 53–77mm SL, Tchaiy-Su between Keyson and Gaziantep.-FSJF 2926, 4, 38–50mm SL; Turkey: Kilis prov.: stream Sünep, 10km east of Kilis, Queik drainage, 36°76'41"N 37°25'41"E.-FSJF 2935, 8, 42–56mm SL; Turkey: Gaziantep prov.: stream Merziman at Bağtepe, Euphrates drainage, 37°32'48"N 37°64'45"E.-FSJF2892, 14, 26–54mm SL; Turkey: Gaziantep prov.: tributary to stream Merziman south of Yavuzeli, 37.2769N 37.5325E. Further study is needed to confirm it from Iran.

150. *Oxynoemacheilus bergianus* (Derzhavin, 1934)

Nemacheilus bergianus Derjavin [A.N.] 1934:109, fig. 8 [Trudy Azerbaidzhanskogo otdela Zakavkazskogo filiala Akademii Nauk SSSR, Sektor Zoologii v. 7.

EN: Safidrud stone loach.

Type locality: Safid River (Sefidrud) drainage.

Distribution: Caspian Sea, Urmia and Namak lake basins.

IUCN: Least Concern.

Comment: The type locality of *Nemacheilus bergianus* in Latin from Derzhavin (1934) is "Systema fluminis Sefidrud" (= Safid River). Berg (1948-1949) gives "Sefid-rud basin: Kisum village; Shah-rud R., falling into the Sefid-rud". The former is at Kisom at 37°14'N, 49°51'E or 37°12'N, 49°54'E in a gazetteer.

151. *Oxynoemacheilus brandtii* (Kessler, 1877)

Nemacheilus brandtii Kessler [K. F.] 1877:174, Pl. 6 (fig. 23) [The Aralo-Caspian Expedition.

EN: Kura loach in Russian.

Type locality: Upper Kura River at Tbilis,

Georgia, Eurasia.

Distribution: Caspian Sea and Urmia Lake basin.

IUCN: Least Concern.

152. *Oxynoemacheilus chomanicus* Kamangar, Prokofiev, Ghaderi & Nalbant, 2014

Oxynoemacheilus chomanicus Kamangar [B.B.], Prokofiev [A.M.], Ghaderi [E.] & Nalbant [T.T.] 2014:46, fig. 5 [Zootaxa 3755 (no. 1).

EN: Choman stone loach.

Type locality: Holotype, FCFUK 176, male, 54.9mm SL, Baneh River, (Korhe-Pazi), Baneh, Kurdistan, Iran, 36° 01' 03" N, 45° 55' 20"E.

Distribution: Tigris.

IUCN: Not Evaluated. But should be considered as Least Concern due to its distribution in Iran, Turkey and probably in Iraq (Little Zab).

Comment: Recently, it has been recorded from Külât Stream; Bitlis, Hizan; 21.09.2010; 38°14'41"N 42°28'45"E, Anadere Stream; Bitlis, Tatvan; 21.09.2010, 38°18'57 "N 42°33'55"E, Kerp Stream; Bitlis, Tatvan; 21.09.2010, 38°21'24"N 42°37'39"E, Cudi Stream; Şırnak; 30.07.2011; 37°28'59"N 42°23'32"E, Beyazsu Stream; Şırnak, Uludere; 30.07.2011; 37°26'28"N 42°44'54"E, all in the upper Tigris River of Turkey (Kaya et al. 2016).

153. *Oxynoemacheilus euphraticus* (Bănărescu & Nalbant 1964)

Noemacheilus insignis euphraticus Bănărescu [P.M.] & Nalbant [T.T.] 1964:175, Pl. 7 (figs. 11-12) [Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut v. 61.

EN: Euphrates loach.

Type locality: Euphrates (Firat Nehri) Basin, Malatya, eastern Anatolia, Turkey. Holotype: ZMH H1889.

Distribution: Tigris.

IUCN: Not Evaluated.

Comment: According to Freyhof (2016b), *O. euphraticus* has not been found in Iran but, he (in the same article), treated *O. freyhofi* as synonyme of *O. euphraticus* without any explanation. Freyhof (2016b) records *O. euphraticus* from Iraq (FSJF 3376, 31, 34.8–73.6mm SL; Iraq: Rezan River near Ziraran, a tributary to Great Zab River, 36°56.60'N 44°11.72'E). Its presence in the Tigris drainage is confirmed by several findings. Freyhof & Ozuluğ (2017) reported it from the Greater Zab and in streams flowing to the Greater Zab, one very small juvenile individual from the lower Lesser Zab, and from the Karun drainage in Iran. It might be more widespread.

154. *Oxynoemacheilus frenatus* (Heckel, 1843) *Cobitis frenata* Heckel [J. J.] 1843:1086 [96] [Ichthyologie [von Syrien]. In Russegger v. 1 (pt 2).

EN: Banded Tigris loach.

Type locality: The type locality of *Cobitis frenata* is "Tigris", presumably at Mosul, Iraq (Heckel, 1843b).

Distribution: Tigris (*Oxynoemacheilus frenatus*: IMNRF-UT-1034, 13, 31-63mm SL, Iran: Kermanshah prov.: Near Direh, at Goleyn village, Goleyn River, Tigris basin, 34°16'09"N 45°56'29"E, Jouladeh-Roudbar et al. 2016).

IUCN: Least Concern.

155. *Oxynoemacheilus freyhofi* Jouladeh-Roudbar, Eagderi & Hosseinpour, 2016*

Oxynoemacheilus freyhofi Jouladeh-Roudbar [A.], Eagderi [S.] & Hosseinpour [T.] 2016:95, figs. 1-7 [FishTaxa v. 1 (no. 2).

EN: Bakhtiyari loach.

Type locality: Roudbar River, tributary of Bakhtiyari River, near Kazem Abad village, 33°08'17.8"N 49°40'43.9"E, S. Eagderi & A. Jouladeh-Roudbar, 19 August 2015.

Distribution: Roudbar River, a tributary of Bakhtiyari River. It is also widespread in the Sezar and Dez rivers which drainage to the Persian Gulf.

IUCN: Not Evaluated.

Freyhof (2016b), treated *O. freyhofi* as synonyme of *O. euphraticus* without any explanation. Further study is needed.

156. *Oxynoemacheilus karunensis* Freyhof, 2016*

Oxynoemacheilus karunensis Freyhof [J.] 2016:94, figs. 1-5 [Zootaxa 4175 (no. 1).

EN: Karun loach.

Type locality: Gamasiab River at Do Ab, Hamadan province, Iran, 34°22'20.76"N, 47°55'00.1"E. Holotype: ZFMK-ICH 102205. Paratypes: FSJF, SMF.

Distribution: It is known from tributaries of the Rivers Jarrahi and Karun in Iran. These rivers flow into the wetlands in the lower estuary area of the Euphrates and Tigris (Freyhof 2016b).

IUCN: Not Evaluated but it should be considered as Least Concern.

157. *Oxynoemacheilus kiabii* Golzarianpour, Abdoli & Freyhof, 2011*

Oxynoemacheilus kiabii Golzarianpour [K.], Abdoli [A.] & Freyhof [J.] 2011: 202, figs. 1-3 [Ichthyological Exploration of Freshwaters v. 22 (no. 3)

EN: Kiabi loach.

Type locality: The holotype ZFMK 41847, 54.5mm standard length is from Hamadan Prov., Dehnoo stream, Karkkeh river drainage, 3km west of Nahavand city, 34°10'N, 48°24'E.

Distribution: Karkkeh River drainage (Tigris).

IUCN: Not Evaluated.

158. *Oxynoemacheilus kurdistanicus* Kamangar, Prokofiev, Ghaderi & Nalbant, 2014

Oxynoemacheilus kurdistanicus Kamangar [B.B.], Prokofiev [A.M.], Ghaderi [E.] & Nalbant [T.T.] 2014:38, fig. 3 [Zootaxa 3755 (no. 1).

EN: Kurdistan stone loach.

Type locality: Holotype: FCFUK 146, male, 57.8mm SL, Choman River (Tajaban),

Baneh, Kurdistan, Iran, 35°56'53"N, 45°41'40"E.

Distribution: Tigris.

IUCN: Not Evaluated But it should be considered as Least Concern due to its wide distribution range in Iran, Iraq and Turkey.

Comment: Sexual dimorphic characters of this species are similar to those in *O. argyrogramma* and *O. hamwii*, two widely distributed and potentially closely related species of the Tigris-Euphrates (see Kamangar et al. 2014). It has been recently recorded from Turkey by Kaya et al. (2016) from few streams in the upper reaches of the Tigris River (Çıratan Stream; Bitlis, Mutki; 38°21'17"N 41°46'53"E, Batman Stream; Diyarbakır, Silvan; 38°09'09"N 41°12'17"E, Tigris River; Diyarbakır, Yenişehir; 38°01'48"N 40°15'14"E, Çay Stream; Bingöl, Genç; 38°38'29"N 40°23'27"E). Freyhof (2016b) recorded it from Iraq and Turkey (*Oxynoemacheilus kurdistanicus*: FSJF 2843, 1, 47 mm SL; Turkey: Diyarbakır prov.: stream Ambar at road to Silvan, 25 km east of Diyarbakır, 37.9902N 40.3824E.—FSJF 2875, 36, 27–69 mm SL; Turkey: Elazığ prov.: Tigris 5 km north of Maden, 38.4157N 39.6531E.—FSJF 2945, 6, 30–68 mm SL; Turkey: Diyarbakır prov.: Spring of Pamuk at Kocaköy, 38.2721N 40.5628E.—FSJF 2951, 12, 44–54 mm SL; Turkey: Diyarbakır prov.: stream Bağlıca between Bismil and Tepe, 37.8084N 40.7169E.—FSJF 2957, 5, 49–54 mm SL; Turkey: Diyarbakır prov.: stream Savur between Bayındır and Ahmetli east of Tepe, 37.7637N 40.8839E.—FSJF 3369, 28, 40–61 mm SL; Iraq: Nalparez River 35°34.24'N 45°51.78'E.—FSJF 3347, 25, 50–62 mm SL; Iraq: stream north-west of Saburawa, a tributary of Tabin River, 35°50'01"N 45°06'16"E.—FSJF 3353, 9, 40–61 mm SL; Iraq: stream Kuna Massi in Sevanja, 35°47.35'N 45°24.18'E.—FSJF 3373, 54, 35–62 mm SL; Iraq: stream Suraw near Suraw village, 35°45.76'N 45°59.09'E.).

159. *Oxynoemacheilus lenkoranensis* (Abdurakhamanov, 1962)
Nemacheilus angorae lenkoranensis

Abdurakhamanov [Y.A.] 1962:285, fig. 50 [Freshwater fishes off Azerbaijan].

EN: Lenkoran stone loach.

Type locality: *Nemacheilus angorae lenkoranensis* Abdurakhamanov, 1962 (incorrectly *lenkoranica* in Bănărescu & Nalbant (1966)) is described from "rivers of the Lenkoran coast; Lenkoranchai, Vilyazhchai, Kumbashichai, Tangyaru, Astarinka" in the southern Caspian Sea basin. No types known.

Comment: Its presence needs confirmation by specimens.

Distribution: Caspian Sea basin.

IUCN: Data Deficient.

160. *Oxynoemacheilus longipinnis* Coad & Nalbant, 2005*

Ilammacheilus longipinnis Coad [B. W.] & Nalbant [T. T.] 2005:304, figs. 1, 3 [Travaux du Muséum d'Histoire Naturelle "Grigore Antipa" v. 48].

EN: Ilam stone loach.

Type locality: Meymeh River, a tributary of the Tigris River sub-basin, 17 km west of Dehloran, Iran and about 21 km east of the Iraqi border, 32°45'30"N, 47°05'30"E.

Distribution: Tigris.

IUCN: Not Evaluated.

161. *Oxynoemacheilus parvinae* Sayyadzadeh, Eagderi & Esmaeili, 2016*

Oxynoemacheilus parvinae Sayyadzadeh [G.], Eagderi [S.] & Esmaeili [H. R.] 2016:238, figs. 2-10 [Iranian Journal of Ichthyology v. 3 (no. 4)].

EN: Parvin stone loach (Figs. 35, 36).

Type locality: Iran: Kermanshah Province: Javanrud city, at Sharvineh village, Leilehrud (Leileh River), a tributary of Sirvan River drainage, Tigris, 34°49'37.9"N, 46°21'30.0"E

Distribution: Tigris.

IUCN: Not Evaluated.

162. *Oxynoemacheilus persa* (Heckel, 1849)*

Cobitis persa Heckel [J.J.] 1847:266 [Reisen

in Europa, Asien und Africa v. 2 (pt 3)].

EN: Persian stone loach.

Type locality: The type locality for *Cobitis Persa* is "Quellen um Persepolis", Fars, Iran (springs at Persepolis) according to Heckel (1847b).

Distribution: Kor River, Mond River and Lake Maharlu basins.

IUCN: Not Evaluated. But, it should be

considered as Least Concern.

Comment: *Oxynoemacheilus farsicus* (Nalbant & Bianco, 1998) was frequently reported from Namak Lake, Kor River and Persis basins. It is named for Fars Province, collected from the "River Kor near Persepolis" in Fars and it is a synonym of *O. persa* according to Freyhof et al. (2011).



Fig. 35. Natural habitat of *Oxynoemacheilus parvinae*, Sefidbarg River at Gandab, Tigris, Persian Gulf basin (H.R. Esmaeili).



Fig. 36. *Oxynoemacheilus parvinae*, Sefidbarg River, Tigris, Persian Gulf basin (H.R. Esmaeili).

163. *Oxynoemacheilus tongiorgii* (Nalbant & Bianco, 1998)*

Seminemacheilus tongiorgii Nalbant [T. T.] & Bianco [P. G.] 1998:113, figs. 11 A-D [Italian Journal of Zoology v. 65, Suppl.

EN: Tongiorgi stone loach.

Type locality: The holotype measures 23.7 mm standard length and is from "large water spring near Darab town, Kul (Kol) River basin".

Distribution: Kor River basin.

IUCN: Data Deficient.

164. *Oxynoemacheilus zagrosensis* Kaman-gar, Prokofiev, Ghaderi & Nalbant, 2014*

Oxynoemacheilus zagrosensis Kamangar [B. B.], Prokofiev [A. M.], Ghaderi [E.] & Nalbant [T.T.] 2014:43, fig. 4 [Zootaxa 3755 (no. 1)].

EN: Zagros stone loach.

Type locality: Holotype, FCFUK 101, male, 55.5 mm SL, Shooei River (Jemli), Baneh, Kurdistan, Iran, 35°58'01"N, 45°42'43"E.

Distribution: Tigris.

IUCN: Not Evaluated.

Genus *Paracobitis* Bleeker, 1863 (9 species)

Paracobitis Bleeker [P.] 1863:37. Fem. *Cobitis malapterura* Valenciennes, 1846. Type by original designation (also monotypic). Also in Bleeker 1863 (after 24 Oct.): 3 and possibly other Bleeker papers.

Etymology: *Paracobitis*: Greek, para = the side of + Greek, kobitis, -idos = a kind of sardine; also related with the voice Greek, kobios, Latin gobius = gudgeon.

Comment: The taxonomy of the nemacheilid loaches of the genus *Paracobitis* was reviewed by Freyhof et al. (2014), who recognized nine species in the Middle East (Iran, Iraq, Turkey). For a long time, *Paracobitis iranica* Nalbant & Bianco, 1998 had been considered as endemic species to Namak Lake basin and *Paracobitis malapterura* (Valenciennes, 1846) as the Caspian Sea basin species. However, Freyhof et al. (2014) considered Namak populations as *P.*

malapterura and treated *P. iranica* as a synonym of *P. malapterura*.

165. *Paracobitis atrakensis* Esmaeili, Mousavi-Sabet, Sayyadzadeh, Vatandoust, & Freyhof, 2014*

Paracobitis atrakensis Esmaeili [H.R.], Mousavi-Sabet [H.], Sayyadzadeh [G.], Vatandoust [S.] & Freyhof [J.] 2014:238, figs. 1-6 [Ichthyological Exploration of Freshwaters v. 25 (no. 3)].

EN: Atrak crested loach.

Type locality: Atrak River about, 10 km east of Bojnurd, Khorasan-e-Shomali prov.: Iran, 37°29'37" N 57°26'25" E.

Distribution: Caspian Sea and Kavir basins.

IUCN: Not Evaluated.

166. *Paracobitis basharensis* Freyhof, Esmaeili, Sayyadzadeh & Geiger, 2014*

Paracobitis basharensis Freyhof [J.], Esmaeili [H. R.], Sayyadzadeh [G.] & Geiger [M.] 2014:23, figs. 13-14 [Ichthyological Exploration of Freshwaters v. 25 (no. 1)].

EN: Bashar crested loach.

Type locality: Bashar River at Dehno (30°38'42.6"N 51°37'14.26"E.), headwater of Karun River, Kohkiluyeh and Boyer-Ahmad prov., Iran. Holotype: ZM-CBSU J2920, 58 mm SL.

Distribution: Tigris.

IUCN: Not Evaluated.

167. *Paracobitis hircanica* Mousavi-Sabet, Sayyadzadeh, Esmaeili, Eagderi, Patimar & Freyhof, 2015*

Paracobitis hircanica Mousavi-Sabet [H.], Sayyadzadeh [G.], Esmaeili [H. R.], Eagderi [S.], Patimar [R.] & Freyhof [J.] 2015:340, figs. 2-6 [Ichthyological Exploration of Freshwaters v. 25 (no. 4)].

EN: Hircan crested loach.

Type locality: Golestan province, Zarrin-Gol stream, a tributary of Gorgan River, 36°50'39"N, 54°58'24"E, Iran.

Distribution: The Caspian Sea basin.

IUCN: Not Evaluated.

168. *Paracobitis longicauda* (Kessler, 1872)
Cobitis longicauda Kessler [K. F.] 1872:65 [21], Pl. 11 (figs. 30-31) [Izvestiia Imperatorskago Obschestva Liubitelei Estestvozniiia, Antropologii i Etnografii v. 10 (no. 1)].

EN: Eastern crested loach.

Type locality: *Cobitis longicauda* was originally described from the Ak-Darya in the Zeravshan River basin of Uzbekistan.

Distribution: Hari River basin.

IUCN: Not Evaluated.

Comment: The species and its distribution are poorly known.

169. *Paracobitis malapterura* (Valenciennes, 1846)*

Cobitis malapterura Valenciennes [A.] in Cuvier & Valenciennes 1846:88, Pl. 523 [Histoire naturelle des poissons v. 18]. The genus *Paracobitis* is feminine, so the correct species spelling is probably *malapterura*.

EN: Namak Lake crested loach.

Type locality: Lake Namak basin, most likely from the Karaj River, which flows close to

Tehran to the south.

Distribution: Namak Lake and Eastern Kavir basin.

IUCN: Not Evaluated.

Comment: The type locality of *P. malapterura* was not known till 2014. Iranian authors usually identify the *Paracobitis* species from the Caspian basin as *P. malapterura* (Abdoli, 2000; Esmaeili et al., 2010), but there is little reason for this assumption. *Paracobitis malapterura* was described by Cuvier & Valenciennes (1846) based on two individuals (MNHN 3962 and B-3070) received in 1840 by the Muséum National d' Histoire Naturelle in Paris (see Freyhof et al. 2014). According to Freyhof et al. (2014) the type locality of this species is Namak Lake basin, most likely from the Karaj River, which flows close to Tehran to

the south.

Paracobitis iranica Nalbant [T.T.] & Bianco [P.G.] 1998:114, figs. 13 A-D [Italian Journal of Zoology v. 65, Suppl.] from River Qom (Namak Lake basin) near the town of Qom, Iran is a synonym (Freyhof et al. 2014).

170. *Paracobitis molavii* Freyhof, Esmaeili, Sayyadzadeh & Geiger, 2014:

Paracobitis molavii Freyhof [J.], Esmaeili [H.R.], Sayyadzadeh [G.] & Geiger [M.] 2014:25, figs. 15-18 [Ichthyological Exploration of Freshwaters v. 25 (no. 1)].

EN: Molavi's crested loach.

Type locality: Sulay-maniyah prov., Zalm at Khormal, 35°18.38' N 45° 58.26' E. Iraq.

Holotype: FMK 56826, 64 mm SL.

Distribution: Tigris.

IUCN: Not Evaluated.

171. *Paracobitis persa* Freyhof, Esmaeili, Sayyadzadeh & Geiger, 2014*

Paracobitis persa Freyhof [J.], Esmaeili [H. R.], Sayyadzadeh [G.] & Geiger [M.] 2014:29, figs. 19-22 [Ichthyological Exploration of Freshwaters v. 25 (no. 1)].

EN: Persian crested loach.

Type locality: Maloosjan spring east of Beiza, Kor River basin, 29°52'23"N 52°27'57"E. Iran. Holotype: ZM-CBSU J2659, 49 mm SL.

Distribution: Kor River basin.

IUCN: Not Evaluated. But should be considered as Critically Endangered.

172. *Paracobitis rhadinaeus* (Regan, 1906)
Nemachilus rhadinaeus Regan [C.T.] 1906:8 [Journal & Proceedings of the Asiatic Society of Bengal (New Series) v. 2 (no. 1) (art. 2)].

EN: Sistan crested loach.

Type locality: Helmand River basin, Seistan, Afghanistan.

Comment: The Catalog of Fishes spells the trivial name as *rhadinaeus* but Kottelat (2012) notes the name is an adjective.

Nemacheilus macmahoni Chaudhuri, 1909 described from the “affluents of the Helmand” is a synonym according to Bănărescu & Nalbant (1966) who refute the opinions of Nikol'skii (1947) and Berg (1948-1949; 1949) who consider *macmahoni* to be identical to *P. malapterura*. Affluents (=headwaters) is an error for effluents (=delta) and the species is not from the upper reaches of the Helmand River basin in Afghanistan as suggested by Kottelat (2012) but from the Helmand delta in Sistan.

Distribution: Sistan basin.

IUCN: Not Evaluated.

173. *Paracobitis vignai* Nalbant & Bianco, 1998*

Paracobitis vignai Nalbant [T.T.] & Bianco [P.G.] 1998:115, figs. 14 A-D [Italian Journal of Zoology v. 65, Suppl.].

EN: Zabol crested loach.

Type locality: The holotype is 89.0 mm standard length (86.5 mm standard length measured by B.W. Coad) collected from "Nahr Taheri (Taheri spring), Zabol, Seistan (Sistan).

Distribution: Sistan basin.

IUCN: Not Evaluated.

Comment: It is endemic to Iran as known only from the type locality.

Genus *Paraschistura* Prokofiev, 2009 (13 species)

Paraschistura Prokofiev [A. M.] 2009:891. Fem. *Nemacheilus sargadensis* Nikolskii 1900. Type by original designation.

Etymology: *Paraschistura*: Generic name taken from its similarity with the genus *Schistura*.

Greek, *para*= beside +*Schistura*: Greek, *schizein* = to divide + Greek, *oura* = tail; an allusion to forked caudal fins.

Comment: Nemacheilid loaches of the genus *Paraschistura* are a group of poorly known species from the Tigris drainage in Turkey east throughout Iran and Pakistan to the Indus River

and the Hari, Murghab and Helmand endorheic basins in Afghanistan, Iran, Pakistan and Turkmenistan (Kottelat 2012). The genus was recently reviewed by Freyhof et al. (2015) who recognized eleven species, with further new species and records.

174. *Paraschistura abdolii* Freyhof, Sayyadzadeh, Esmaili & Geiger 2015*

Paraschistura abdolii Freyhof [J.], Sayyadzadeh [G.], Esmaili [H.R.] & Geiger [M.] 2015:19, figs. 19-23 [Ichthyological Exploration of Freshwaters v. 26 (no. 1)].

EN: Abdoli's loach

Type locality: Kerman Province, Pol River at road between Rayen and Jiroft, Lut Basin, 29°21'06"N, 57°29'09"E, Iran.

Distribution: Kol, Hamun-e Jaz Murian and Sirjan drainage basins.

IUCN: Not Evaluated.

175. *Paraschistura alta* (Nalbant & Bianco, 1998)

Schistura alta Nalbant [T.T.] & Bianco [P.G.] 1998:118, fig. 21 [Italian Journal of Zoology v. 65, Suppl.].

EN: Helmand loach.

Type locality: Helmand river drainage, northeast of Girisk, Kajkai, Afghanistan.

Distribution: Helmand River, Sistan basin. Zahak River, Sistan and Baluchestan Province, near Zabol 30°49'32"N, 61°45'36"E (Jouladeh-Roudbar et al. 2015).

IUCN: Not Evaluated.

176. *Paraschistura aredvii* Freyhof, Sayyadzadeh, Esmaili & Geiger 2015*

Paraschistura aredvii Freyhof [J.], Sayyadzadeh [G.], Esmaili [H.R.] & Geiger [M.] 2015:25, figs. 24-28 [Ichthyological Exploration of Freshwaters v. 26 (no. 1)].

EN: Anahita loach.

Type locality: Fars Province, Sarab-e Bahram spring at Sarab-e Bahram, a tributary of Fahlian River, 30°02'48"N, 51°33'34"E, Iran.

Distribution: Zohreh River drainages.

IUCN: Not Evaluated.

177. *Paraschistura bampurensis* (Nicol'skii, 1900)*

Nemacheilus bampurensis Nikolskii [A. hM.] 1900:414 [40] [Ezhegodnik. Zoologicheskogo Muzeya Imperatorskoi Akademii Nauk SSSR v. 4].

EN: Bampur loach

Type locality: Kjagur and Kashin [Kaekin] rivers, Bampur River near Bazman, Iran.

Distribution: Hamun-e Jaz Murian (Karvandar and Irandegan Rivers), the Hamun-e Mashkel (Mashkid) (Kormadkor River) and Makran (Sarbaz River). According to Freyhof et al. (2015) *P. bampurensis* is known from the Hamun-e Panjur basin in Pakistan, the Hamun-e Mashkel (Mashkid) basin and the eastern tributaries to the Hamun-e Jaz Murian basin in Iran and Pakistan. It is also widespread in the Iranian Bahookalat River drainage in the Gulf of Oman basin close to the Pakistan border.

IUCN: Not Evaluated.

Comment: *Nemachilus baluchiorum* Zugmayer, 1912: 599 is a synonym (Freyhof et al. 2015).

178. *Paraschistura cristata* (Berg, 1898):

Nemacheilus cristatus Berg [L.S.] 1898:19 [5], fig. [Dnevn. Zool. Otdel. Obsh. Zool. Mus. v. 2 (no. 7)].

EN: Turkmenian crested loach.

Type locality: The type locality is presumably the Hari (Tezhen) River in Turkmenistan although Ashkhabad is not on the Tedzhen River.

Distribution: Hari River basin.

IUCN: Not Evaluated.

Comment: Prokofiev (2009) considered it as *Metaschistura cristata* (Berg, 1898) while Freyhof et al. (2015) treated *Metaschistura cristata* as a synonym of *Paraschistura cristata*.

179. *Paraschistura delvarii* Mousavi-Sabet

& Eagderi, 2015*

Paraschistura delvarii Mousavi-Sabet [H.] & Eagderi [S.] 2015:299, figs. 2-5 [Vertebrate Zoology v. 65 (no. 3)].

EN: Delvari's loach, Mond loach.

Type locality: Iran, Fars prov.: upstream of Mond River, Mond River drainage, the Persian Gulf basin, 29°40'22"N, 52°08'57"E.

Distribution: Mond River (Persis).

IUCN: Not Evaluated.

Comment: It was considered to be distinct species by Freyhof et al. (2015) based on the molecular data.

180. *Paraschistura hormuzensis* Freyhof, Sayyadzadeh, Esmaeili & Geiger 2015*

Paraschistura hormuzensis Freyhof [J.], Sayyadzadeh [G.], Esmaeili [H. R.] & Geiger [M.] 2015:28, figs 29-33 [Ichthyological Exploration of Freshwaters v. 26 (no. 1)].

EN: Hormuz loach.

Type locality: Hormuzgan Province, Rudan River at Abnama Bridge, a tributary of Minab River, 27°28'24"N, 57°15'14"E, Iran.

Distribution: Minab River (Makran basin).

IUCN: Not Evaluated.

181. *Paraschistura kessleri* (Günther, 1889)

Nemachilus kessleri Günther [A.] 1889:109 [The Transactions of the Linnean Society of London. Second Series. Zoology v. 5 (pt 3)].

EN: Kessler loach.

Type locality: Nushki, Pishin Lora River basin, Afghanistan or Pakistan.

Distribution: Sistan and Mashkid.

IUCN: Not Evaluated.

Comment: *Nemacheilus kessleri* was described from Nushki, a city on Pishin River in the Lora drainage. During Gunther's times (Gunther, 1889), Nushki was situated in Afghanistan but today, it is part of Pakistan (Freyhof et al. 2015).

Freyhof et al. (2015) treated *P. sargadensis* (Nicol'skii, 1900) as a synonym of *P. kessleri*.

182. *Paraschistura naumanni* Freyhof, Sayyadzadeh, Esmaeili & Geiger, 2015*

Paraschistura naumanni Freyhof [J.], Sayyadzadeh [G.], Esmaeili [H. R.] & Geiger [M.] 2015:32, figs. 34-41 [Ichthyological Exploration of Freshwaters v. 26 (no. 1)];

EN: Naumann loach

Type locality: Fars Province, Golabi spring, about 35 km west of Darab, a tributary of Kol River, 28°47'15"N, 54°22'19"E, Iran.

Distribution: Lake Maharlu, Persis and Hormuz.

IUCN: Not Evaluated.

183. *Paraschistura nielseni* (Nalbant & Bianco, 1998)*

Schistura nielseni Nalbant [T.T.] & Bianco [P.G.] 1998:119, figs. 22 A-C [Italian Journal of Zoology v. 65, Suppl.].

EN: Nielsen's loach (Fig. 37).

Type locality: Bazar River, Iran (Shapur Rivar, 12 km northwest of Kazerun, Iran).

Distribution: Helleh and Mond River drainages (Persis).

IUCN: Not Evaluated.

184. *Paraschistura pasatigris* Freyhof, Sayyadzadeh, Esmaeili & Geiger, 2015*

Paraschistura pasatigris Freyhof [J.], Sayyadzadeh [G.], Esmaeili [H.R.] & Geiger [M.] 2015:37, figs. 42-47 [Ichthyological Exploration of Freshwaters v. 26 (no. 1)].

EN: Pasatigris loach.

Type locality: Khozestan Province, Bala River (Balarud), at Dezful, a tributary of Dez River, 32°20'14"N, 48°17'14"E, Iran.

Distribution: Tigris River drainages [Bala River (Balarud) and the Cholvar River, two tributaries of the Dez in the Karun drainage and from the Siah Gav in the Karkheh drainage].

IUCN: Not Evaluated.

Comment: Jouladeh-Roudbar et al. (2015b) considered *Paraschistura ilamensis* Vatandoust & Eagderi, 2015 as a valid species.

185. *Paraschistura susiani* Freyhof, Sayyadzadeh, Esmaeili & Geiger, 2015*

Paraschistura susiani Freyhof [J.], Sayyadzadeh [G.], Esmaeili [H.R.] & Geiger [M.] 2015:41, figs. 48-52 [Ichthyological Exploration of Freshwaters v. 26 (no. 1)].

EN: Susian loach, Susa loach.

Type locality: Khozestan Province, Zard River close to Rudzard village at road from Ramhormoz to Baghmalek, a tributary of Jarahi, 31°22'34"N, 49°43'11"E, Iran.

Distribution: Tigris River drainages (tributaries of the Jarahi River: the Marun, Ab-e Ala and Zard Rivers). The Jarahi Rivers flows into the Shadegan wetland in the lowermost estuary area of the Euphrates and Tigris.

IUCN: Not Evaluated.

186. *Paraschistura turcmenica* (Berg, 1932)

Nemacheilus turcmenicus Berg [L.S.] 1932:149, fig. 1 [Zoologischer Anzeiger v. 98 (nos 5/6)].

EN: Turkmen Loach.

Type locality: Kelte-chinar River [Cherokh River] near Gyaur (37°47'N, 58°44'E), Turkmenistan.

Distribution: Bedjestan, Hari River and Kavir basins (rivers flowing in the eastern Kavir basin and towards the western Karakum desert: the Hari in Afghanistan, Iran and Turkmenistan, the Murgabin Afghanistan and Turkmenistan and the streams of the northern slope of Kopetdag in Turkmenistan).

IUCN: Not Evaluated.

Comment: *Nemacheilus kessleri turcomanus* Nikolskii [G.V.] 1947:32, fig. 3 [Bulletin de la Société de las Naturalistes de Moscow, Section Biologique (n.s.) v. 52 (no. 3)] is a synonym according to Freyhof et al. (2015), but Mousavi-Sabet et al. (2015) consider it as valid species of *P. turcomana*.

Genus *Sasanidus* Freyhof, Geiger, Golzarianpour & Patimar, 2016 (1 species)
Sasanidus Freyhof [J.], Geiger [M.F.],

Golzarianpour [K.] & Patimar [R.] 2016:70. Masc. *Noemacheilus kermanshahensis* Bănărescu & Nalbant 1966. Type by original designation (also monotypic).

Etymology: The genus is named for the Sassanid Empire, which was recognized as one of the leading regional powers for a period of more than 400 years. During Late Antiquity, the Sasanian Empire is considered to have been one of Iran's most important and influential historical periods (Freyhof et al. 2016).

187. *Sasanidus kermanshahensis* (Bănărescu & Nalbant, 1966)*

Noemacheilus kermanshahensis, Bănărescu [P. M.] & Nalbant [T.T.] 1966:151, Figs. 1-2; Pl. 19 (fig. 2) [Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening, Kjøbenhavn. v. 129].

EN: Kermanshah stone loach.

Type locality: The type locality is Kermanshah in the drainage of the Karun River, a tributary of the lower Tigris river, Western Iran.

Distribution: The headwaters of the Karkheh and Dez Rivers. The Dez is a tributary to the Karun and both the Karkheh and Karun flow from the Iranian Zagros Mountains westwards into the lowermost Tigris (Freyhof et al. 2016).

IUCN: Not Evaluated.

Genus *Triplophysa* Rendahl, 1933 (1 species)

Triplophysa (subgenus of *Nemacheilus*) Rendahl [H.] 1933:21. Fem. *Nemacheilus hutjertjuensis* Rendahl 1933. Type by original designation (also monotypic).

Etymology: *Triplophysa*: Greek, triplos = thrice + Greek, physa = tube.

188. *Triplophysa stolicikai* (Steindachner, 1866):

Cobitis stolicikai Steindachner [F.] 1866:793, Pl. 14 (fig. 2) [Verhandlungen der K.-K. zoologisch-botanischen Gesellschaft in Wien v. 16].

EN: Tibetan stone loach.

Type locality: Umgebung River, Rupshu Province, western Tibet, elevation 15550

feet.

Distribution: Sistan basin.

IUCN: Not Evaluated.

Genus *Turcinoemacheilus* Bănărescu & Nalbant, 1964 (4 species)

Turcinoemacheilus Bănărescu [P.M.] & Nalbant [T.T.] 1964:178]. Masc. *Turcinoemacheilus kosswigi* Bănărescu & Nalbant 1964. Type by original designation (also monotypic).

Etymology: from *Turcu* (Turk)+*Nemacheilus*: Greek, nema, -atos = filament + Greek, cheilos = lip.

189. *Turcinoemacheilus bahaii* Esmaeili, Sayyadzadeh, Özuluğ, Geiger & Freyhof, 2014*

Turcinoemacheilus bahaii Esmaeili [H.R.], Sayyadzadeh [G.], Özuluğ [M.], Geiger [M.] & Freyhof [J.] 2014:259, figs. 3-6, 7a [Ichthyological Exploration of Freshwaters v. 24 (no. 3)].

EN: Esfahan dwarf loach.

Type locality: Esfahan province, Zayandeh River between Azadegan and Qalee Shahrokh, 32°40'54"N, 50°27'47"E, Iran. Holotype: ZM-CBSU 7193B.

Distribution: Zayandeh River (Esfahan) basin.

IUCN: Not Evaluated.

190. *Turcinoemacheilus hafezi* Golzarianpour, Abdoli, Patimar & Freyhof, 2013*

Turcinoemacheilus hafezi Golzarianpour [K.], Abdoli [A.], Patimar [R.] & Freyhof [J.] 2013:43, figs. 1-6, 8 [Ichthyological Exploration of Freshwaters v. 24 (no. 1)].

EN: Hafez dwarf loach.

Type locality: Stream at Joneqon, tributary of Kohrang River, Iran, 32°05'22"N, 50°39'48"E.

Distribution: Karoun and Dez drainages (lowermost part of Tigris).

IUCN: Not Evaluated.

191. *Turcinoemacheilus kosswigi* Bănărescu

& Nalbant, 1964

Turcinoemacheilus kosswigi Bănărescu [P.M.] & Nalbant [T.T.] 1964:178, Pl. 8 (fig. 14) [Mitteilungen aus dem Hamburgischen Zoologischen Museum und Institut v. 61].

EN: Zagroz dwarf loach.

Type locality: Kapozik Kadun, Hakkari [37°34'40"N, 43°44'10"E], Tigris (Dicle Nehri basin), Turkey. Holotype: ZMH H1884. Paratypes: ZMH H1885 (6).

Distribution: Tigris.

IUCN: Least Concern.

192. *Turcinoemacheilus saadii* Esmaeili, Sayyadzadeh, Özuluğ, Geiger & Freyhof, 2014*

Turcinoemacheilus saadii Esmaeili [H.R.], Sayyadzadeh [G.], Özuluğ [M.], Geiger [M.] & Freyhof [J.] 2014:268, figs. 7c, 13-15 [Ichthyological Exploration of Freshwaters v. 24 (no. 3)].

EN: Saadi dwarf loach.

Type locality: Fars province, stream Tang-e-Tizab, a tributary to Bashar River which drains to the Karoun, 30°23'12"N, 51°46'50"E, Iran. Holotype: ZM-CBSU 7169B.

Distribution: Karun River drainages (Tigris).

IUCN: Not Evaluated.

Order Siluriformes (4 families, 4 genera and 6 species)

Family Bagridae Bleeker, 1858 (1 genus and 1 species)

Genus *Mystus* Scopoli, 1777 (1 species)

Mystus Scopoli [J. A.] (ex Gronow) 1777:451. Masc. *Bagrus halepensis* Valenciennes 1840. Type by subsequent designation. Type species established in Opinion 2209 (Case 3382) in 2008 as by subsequent designation of Jordan & Evermann 1917 [= Jordan 1917:17].

Etymology: *Mystus*: Greek, mystax = whiskered, used by Belon in 1553 to describe all fishes with whiskers or barbels.

193. *Mystus pelusius* (Solander, 1794)

Silurus pelusius Solander [D.C.] in Russell

1794:210, Pl. 7 (fig. 1) [Natural History of Aleppo. Second Edition v. 2].

EN: Zugzug Catfish, Tigris mystus.

Type locality: Kandili Karassu, upper Araxes basin, eastern Turkey.

Distribution: Tigris and Kol River drainages (Hormuz).

IUCN: Least Concern.

Comments: *Bagrus halepensis* Valenciennes, 1840, *Macrones aleppensis* Günther, 1864, *Macrones colvillii* Günther, 1874, and *Mystus misrai* Anuradha, 1986 are synonyms.

Family Siluridae Cuvier, 1816 (2 genera and 2 species)

Genus *Silurus* Linnaeus, 1758 (2 species)

Silurus Linnaeus [C.] 1758:304. Masc. *Silurus glanis* Linnaeus, 1758. Type by Linnaean tautonymy.

Etymology: *Silurus*: Greek, silouros = a cat fish + Greek, odous = teeth.

194. *Silurus glanis* Linnaeus, 1758

Silurus Linnaeus, 1758: 304 (type species: *Silurus glanis* Linnaeus, 1758: 304, by Linnaean tautonymy; on Official List of Generic Names in Zoology, ICZN, 1956b: 339 [Direction 56]). Gender masculine (Kottelat 2013).

EN: Wels catfish.

Type locality: Lakes of Europe, Sweden.

Distribution: Caspian Sea and Urmia Lake basins.

IUCN: Least Concern

195. *Silurus triostegus* Heckel, 1843

Silurus triostegus Heckel [J. J.] 1843:1090 [100] [Ichthyologie [von Syrien]. In Russegger v. 1 (pt 2).

EN: Mesopotamian catfish.

Type locality: Tigris River, near Mosul, Iraq.

Distribution: Tigris.

IUCN: Least Concern

Family Sisoridae (1 genus and 2 species)

Genus *Glyptothorax* Blyth, 1860 (2 species)

Glyptothorax Blyth [E.] 1860:154. Masc.

Glyptosternon striatus McClelland 1842. Type by subsequent designation. Text somewhat unclear, but apparently three species included. Type designated by Bleeker 1863:105.

Etymology: *Glyptothorax*: Greek, glyptes = carver + Greek, thorax = breast.

196. *Glyptothorax silviae* Coad, 1981*

Glyptothorax silviae Coad [B.W.] 1981:291, figs. 1-3 [Japanese Journal of Ichthyology v. 27 (no. 4)].

EN: Southern sucking catfish.

Type locality: "Khuzestan, stream 3 km south of Bagh-e Malek, tributary to Rud-e Zard or Ab-e Ala in the drainage of the Jarrahi River, 31°29'N, 49°54'30"E".

Distribution: Tigris and Persis.

IUCN: Not Evaluated.

197. *Glyptothorax kurdistanicus* (Berg, 1931)

Glyptosternum kurdistanicum Berg [L. S.] 1931:1267, Pl. 1 (fig. 2); fig. 1 [Izvestia Akademii nauk Soiuza Sotsialisticheskikh Reespublik. VII Serii, Otdelenie matematischeskikh i estestvennykh nauk = Bulletin de l'Académie des sciences de l'Union des Républiques Sovuétiques Socialistes. VII Série, Classe des sciences + 1931].

EN: Kordestan sucking catfish.

Type locality: Baneh, the village Germav (or Germav) = Garmab (probably 35°51'46.46"N 45°46'33.89"E) at Little Zab, River Bané basin, Iran, elevation 1500 meters.

Distribution: Tigris.

IUCN: Data Deficient.

Family Heteropneustidae Hora, 1936a: 209 (type genus: *Heteropneustes*

Müller, 1840: 115) (1 genus and 1 species)

Genus *Heteropneustes* Müller, 1840 (1 species)

Heteropneustes Müller [J.] 1840:115. Masc. *Silurus fossilis* Bloch, 1794. Type by monotypy. Appeared first as above; then in Müller 1841:243. *Heteropneustes* and

Saccobranchus were described in the same year, but the individual dates are uncertain (Kottelat 2013:245).

198. *Heteropneustes fossilis* (Bloch, 1794)**

Silurus fossilis Bloch [M. E.] 1794:46, Pl. 370 (fig. 2) [Naturgeschichte der ausländischen Fische v. 8].

EN: Stinging catfish.

Type locality: Tranquebar [Tharangambadi], India. Lectotype: ZMB 3074.

Distribution: Introduced to the Tigris River drainages.

IUCN: Least Concern.

Order Salmoniformes (1 family, 5 genera and 7 species)

Family Salmonidae (5 genera and 7 species)

Genus *Coregonus* Linnaeus, 1758 (1 species)

Coregonus (subgenus of *Salmo*) Linnaeus [C.] 1758:310. Masc. *Salmo lavaretus* Linnaeus, 1758. Appeared as "Coregoni", as subgroup of *Salmo*; made available by the ICZN. Type designated by the ICZN using Plenary Powers; on Official List (Opinion 93), *Coregonus* Lacepède 1803 and of Jarocki 1822 placed on Official Index (Direction 56).

Etymology: *Coregonus*: Greek, kore = pupils of the eye + Greek, gonia = angle.

199. *Coregonus lavaretus* (Linnaeus, 1758)**

Salmo avaretus Linnaeus [C.] 1758:310 [Systema Naturae, Ed. X v. 1].

EN: Lavaret.

Type locality: Lake Bourget, France. Neotype: MHNG 2583.51.

Distribution: Introduced to reservoirs in the Namak Lake basin. Fingerlings were released into the Karaj and Latian reservoirs near Tehran from 1965-1968 after hatching from eggs imported from Europe (Armantrout, 1980).

IUCN: Vulnerable D2 (native population).

Genus *Oncorhynchus* Suckley, 1861 (2 species)

Oncorhynchus (subgenus of *Salmo*) Suckley [G.] 1861:313. Masc. *Salmo scouleri*

Richardson, 1836. Type by original designation.

Etymology: *Oncorhynchus*: Greek, onyx, -ychos = nail + Greek, rhyngchos = snout.

200. *Oncorhynchus keta* (Walbaum, 1792)**
Salmo keta Walbaum [J.J.] 1792:72 [Petri Artedi sueci genera piscium Part 3].

EN: Chum salmon.

Type locality: Rivers of Kamchatka, Russia. No types known.

Distribution: Introduced to the Caspian Sea basin.

IUCN: Not Evaluated.

201. *Oncorhynchus mykiss* (Walbaum, 1792)**

Salmo mykiss Walbaum [J. J.] 1792:59 [Petri Artedi sueci genera piscium Part 3].

EN: Rainbow trout.

Type locality: Kamchatka, Russia. No types known.

Distribution: Introduced to the Tigris, Caspian Sea, Lake Urmia, Namak Lake, Kavir, Esfahan and Kor River basins, and widely farmed.

IUCN: Not Evaluated.

Genus *Salmo* Linnaeus, 1758 (2 species)

Salmo Linnaeus [C.] 1758:308. Masc. *Salmo salar* Linnaeus, 1758. Type by subsequent designation. Type designated by Desmarest 1856:312 according to Whitley 1939:225 but Whitley has wrong date for Desmarest; also designated by Jordan & Gilbert 1883:309. On Official List (Opinion 77, Direction 56).

Etymology: *Salmo*: Latin, salmo, Plinius = salmon.

Comments: There are controversial debates about the taxonomic status of *Salmo* populations. The numerous forms of brown trout *Salmo trutta* L., 1758 have been classified under different taxonomic groupings. For example, c. 50 species have been described for varieties of *S. trutta*, including 10 species found only in the British Isles (Elliot 1994). According to Berg (1948), *S. trutta* is represented by six subspecies within the former

Soviet Union: *Salmo trutta trutta* L., 1758, *Salmo trutta labrax* Pallas, 1814, *Salmo trutta caspius* Kessler, 1877, *Salmo trutta oxianus* Kessler, 1874, *Salmo trutta aralensis* Berg, 1908 and *Salmo trutta ezenami* Berg, 1948. In recent years, new taxonomic procedures, new concepts and renewed interest in the taxonomy of European freshwater fishes has shed a new light on trout taxonomy. In parallel, the results of molecular studies have shown that *S. trutta* sensu lato is made of a number of distinct lineages (see, e.g., Bernatchez 2001; Sušnik et al. 2005; Bardakçı et al. 2006). Additionally, Kottelat & Freyhof (2007) referred to different populations of Caspian trout as *S. trutta* (northern Caspian basin), *Salmo ciscaucasicus* Dorofeeva, 1967 (western Caspian basin), and *Salmo caspius* Kessler, 1877 (southern Caspian basin). *Salmo caspius* Kessler [K. F.] 1877:62, Pl. 2 (fig. 15) [The Aralo-Caspian Expedition] was described from Kura River near Bozhii Promysel fishing grounds, Azerbaijan. Syntypes: (3) not at ZIN. It was considered as synonym of *Salmo trutta* Linnaeus, 1758, but a valid subspecies (Berg 1948:242, Reshetnikov et al. 1997:729, Dorofeeva & Savvaitova 1998:36. Its subspecies is regarded as a full species (Naseka & Bogutskaya 2009, Fricke et al. 2007:55, Ninua & Japoshvili, 2008:168, Esmaeili et al. 2010a:374, Turan et al. 2010:362, Turan et al. 2011:32, Turan et al. 2012:234, Turan et al. 2014:285, Turan et al. 2014:149, Jouladeh-Roudbar et al. 2015b:891). Based on mtDNA analysis of the *S. trutta* populations, Hashemzadeh Segherloo et al. (2012) inferred that the populations of the Orumieh (Urmia) and southern Caspian basins are of the same maternal origin, as showing a common haplotype. In contrast, in the case of the Karaj River population (Namak basin), the observed haplotype was unique and was not observed in other populations. Further study is needed.

202. *Salmo caspius* Kessler, 1877

Salmo caspius Kessler [K.F.] 1877:62, Pl. 2 (fig. 15) [The Aralo-Caspian Expedition].

EN: Caspian trout.

Type locality: Kura River near Bozhii Promysel fishing grounds, Azerbaijan.

Distribution: Caspian Sea.

IUCN: Not Evaluated.

Salmo salar Linnaeus, 1758 has been introduced to the Caspian Sea but no Iranian record.

203. *Salmo trutta* Linnaeus, 1758: (native and introduced, Coad & Abdoli 1993)

Salmo trutta Linnaeus [C.] 1758:308 [Systema Naturae, Ed. X v. 1].

EN: Brown trout.

Type locality: European rivers. No types known.

Distribution: Caspian, Urmia, Namak.

IUCN: Least Concern.

Comment: Brown trout were artificially planted in Gahar Lake of the upper Dez River of the Tigris River basin where viable populations existed in the 1970s in both the upper and lower lake, and more recently (B. Sandford, *in litt.* 1979). European brown trout were planted in the Caspian Sea and Namak Lake basin and established south of Dorud in the Zagros, and in the Zayandeh River dam but their origin is unknown (Coad & Abdoli 1993). Trout were also introduced to the Karun River basin and the Zayandeh River Dam (Y. Keivany, *in litt.* 1992). Trout are also recorded from the Lake Urmia basin in the upper Talkheh, Zarreineh and Tatavi rivers (Abdoli 2000) but whether these are introduced is not certain (see Coad 2017).

Salmo tigridis Turan [D.], Kottelat [M.] & Bektaş [Y.] 2011:24, fig. 1 [Zootaxa No. 2993] has been described from Çatak Stream, Tigris River drainage, Van Province, Turkey. It probably exists in Iranian waters but requires confirmation by specimens (Coad 2017).

Genus *Salvelinus* Richardson, 1836 (1 species)

Salvelinus (subgenus of *Salmo*) Richardson [J.] (ex Nilsson) 1836:169. Masc. *Salmo salvelinus* Linnaeus, 1758. Mentioned under *Salmo alipes*

Richardson, as "Sub-genus, *Salvelinus*. Nilsson" and in text (p. 169) as a sub-group "Salvelini." Species included are those on Richardson's p. 139 as Salvelini (not an absolute direct association perhaps, see Art. 67.12 and Appendix A in Eschmeyer 1990); type by absolute tautonymy.

Etymology: *Salvelinus*: Old name for char; it is the same root of German "saibling" = little salmon.

204. *Salvelinus fontinalis* (Mitchill, 1814)**
Salmo fontinalis Mitchill [S.L.] 1814:12 [Report, in part, of Samuel L. Mitchill].

EN: Brook trout.

Type locality: New York, U.S.A. No types known.

Distribution: Introduced to the Namak Lake basin.

IUCN: Not Evaluated.

Comment: A private hatchery on the Jajrud imported over 1 million brook trout eggs which were raised to fingerling size only for most to be lost in a flood in 1968. Some were planted in the Jajrud and in the Latian Reservoir in the Namak Lake basin. Survival remains unknown. Also recorded from the Sardab and Chalus rivers of the Caspian Sea basin (*Annual Report, 1994-1995, Iranian Fisheries Research and Training Organization, Tehran*, p. 26, 1996) but this is possibly a misidentification for *Oncorhynchus mykiss* (Coad 2017). No recent record.

Genus *Stenodus* Richardson, 1836 (1 species)

Stenodus Richardson [J.] 1836:384. Masc. *Salmo mackenzii* Richardson, 1823. Type by monotypy.

Etymology: *Stenodus*: Greek, stenos = narrow + Greek, odous = teeth.

205. *Stenodus leucichthys* (Güldenstaedt, 1772)

Salmo leucichthys Güldenstädt [J.A. von] 1772:533 [Novi Commentarii Academiae Scientiarum Imperialis Petropolitanae v. 16 (for 1771)].

EN: Inconnu, Sheefish.

Type locality: Volga and Ural rivers from Caspian Sea, Kamtchatka, Russia. No types known.

Distribution: Caspian Sea basin.

IUCN: Extinct in the Wild.

Order Esociformes (1 family, 1 genus and 1 species)

Family Esocidae (1 genus and 1 species)

Genus *Esox* Linnaeus, 1758 (1 species)

Esox Linnaeus [C.] 1758:313. Masc. *Esox lucius* Linnaeus, 1758. Type by subsequent designation. *Exos* Nardo, 1847:col. 127 is regarded as a misspelling. Spelled *Esok* by Ascanius 1767:37. Type designated by Jordan & Gilbert 1883:352. On Official List (Opinion 92, Direction 56).

Etymology: *Esox*: From Greek, isox and also related with the Celtic root, eog, ehawc = salmon.

206. *Esox lucius* Linnaeus, 1758

Esox lucius Linnaeus [C.] 1758:314 [Systema Naturae, Ed. X v. 1.

EN: Northern pike.

Type locality: Europe.

Distribution: Caspian Sea basin; introduced in some lakes and reservoirs of Iran.

IUCN: Least Concern.

Order Gadiformes (1 family, 1 genus and 1 species)

Family Gadidae (1 genus and 1 species)

Comment: Nelson et al. (2016) consider *Lot lota* in the family Gadidae, subfamily Lotinae.

Genus *Lota* Oken, 1817

Lota Oken [L.] (ex Cuvier) 1817:1182a. Fem. *Gadus lota* Linnaeus, 1758. Type by subsequent absolute tautonymy. Technical addition of species not researched; type usually given as by tautonymy. Based on "Les Lottes" of Cuvier 1816:215.

Etymology: *Lota*: French name for the cod.

207. *Lota lota* (Linnaeus, 1758)

Gadus lota Linnaeus [C.] 1758:255 [Systema Naturae, Ed. X v. 1.

EN: Burbot.

Type locality: European lakes.

Distribution: Caspian Sea basin.

IUCN: Least Concern (native population).

Order Gobiiformes (1 family, 15 genera 42 species) (see Tacker 2010; Nelson et al. 2016).

Family Gobiidae (15 genera and 42 species, 19 unconfirmed)

Genus *Anatirostrum* Iljin, 1930 (1 species)

Anatirostrum Iljin [B. S.] 1930:19, 31, 48. Neut. *Benthophilus profundorum* Berg, 1927.

Type by original designation (also monotypic).

Etymology: *Anatirostrum*: Latin, anas = duck + Latin, rostrum = face.

208. *Anatirostrum profundorum* (Berg, 1927)

Benthophilus profundorum Berg [L. S.] 1927:335, figs. 5-8 [Collection of papers in honor of Prof. Knipowitsch].

EN: Duckbill goby, Duckbill pugolovka.

Type locality: Southern Caspian Sea.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

Genus *Babka* Iljin, 1927 (2 species, 2 unconfirmed)

Babka (subgenus of *Gobius*) Iljin [B. S.] 1927:132. Fem. *Gobius gymnotrachelus* Kessler, 1857. Type by monotypy. Treated as feminine, Art. 30.2.4.

Comment: Members of this genus were formerly placed in the genus *Neogobius* Iljin, 1927.

209. *Babka gymnotrachelus* (Kessler, 1857)

Gobius gymnotrachelus Kessler [K.F.] 1857:464 [Bulletin de la Société Impériale des Naturalistes de Moscou v. 30 (pt 2)].

EN: Racer goby.

Type locality: Dniester River and tributaries.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Comment: Presence in Iranian waters needs confirmation. Record from Kottelat and Freyhof (2007).

210. *Babka macrophthalmus* (Kessler, 1877)

Gobius macrophthalmus Kessler [K.F.] 1877:29, Pl. 2 (fig. 6) [The Aralo-Caspian

Expedition].

EN: Bigeye goby.

Type locality: Middle and southern part of Caspian Sea.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

Comment: Reported from the Middle and South Caspian Sea by Naseka & Bogutskaya (2009) but not confirmed by specimens for Iran. It has been considered as synonyme of *Babka gymnotrachelus* (Kessler 1857).

Genus *Benthophiloides* Beling & Iljin, 1927
(2 species)

Benthophiloides Beling [D.E.] & Iljin [B.S.] 1927:309, 324. Masc. *Benthophiloides brauneri* Beling & Iljin 1927. Type by monotypy. Also appeared in Iljin 1927:129, 131 earliest not established.

Etymology: *Benthophiloides*: Greek, benthos = depth of the sea + Greek, phyle, that loves.

211. *Benthophiloides brauneri* Beling & Iljin, 1927

Benthophiloides brauneri Beling [D.E.] & Iljin [B.S.] 1927:309, figs. 1-2, 5, 8 [Trav. Sta. Biol. Dniepre, Acad. Sci. Ukraine v. 3, livr. 7, no. 2].

EN: -

Type locality: Lower Dnieper River between Kherson and Kakhovka and southern Bug River between Novaya Odessa and Nikolayev, Ukraine.

Distribution: Caspian Sea basin.

IUCN: Data Deficient.

Comment: Reported from the Middle and South Caspian Sea by Naseka & Bogutskaya (2009) but not confirmed by specimens for Iran.

212. *Benthophiloides turcomanus* (Iljin, 1941)

Asra turcomanus Iljin [B. S.] 1941:385, 388, figs. 1-4 [Izvestiya Akademii Nauk SSSR, Otdeleniya Biologiya Nauk No. 3 (for 1941)].

EN: -

Type locality: Caspian Sea, off Chikishlar

[Chikishlyar], 37°45.5'N, 53°47'E. 9.3 meters; southwest of Ulsky Bank, 38°05'N, 52°34'E, depth 26.5 meters, Turkmenistan.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

Comment: Reported from the Middle and South Caspian Sea by Naseka & Bogutskaya (2009) but not confirmed by specimens for Iran.

Genus *Benthophilus* Eichwald, 1831 (16 species, 11 unconfirmed)

Benthophilus (subgenus of *Gobius*) Eichwald [C.E. von] 1831:77. Masc. *Gobius macrocephalus* Pallas, 1788. Type by monotypy. Appeared as subgenus of *Gobius* Linnaeus, 1758. Also appeared as new in Eichward 1838:102, and in Eichwald 1838:139 as *Benthophilus*.

Etymology: *Benthophilus*: Greek, benthos = depth of the sea + Greek, phyle, that loves.

213. *Benthophilus abdurahmanovi* Ragimov, 1978

Benthophilus magistri abdurahmanovi Ragimov [D.B.] 1978:793 [703] [Voprosy Ikhtiologii v. 18 (no. 5)].

EN: Abdurakhmanov's tadpole goby.

Type locality: East coast of Tyuleniy Island, northern Caspian Sea, depth 2.7 meters.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

Comment: Reported from the middle and south Caspian Sea by Naseka & Bogutskaya (2009) but not confirmed by specimens for Iran.

214. *Benthophilus baeri* Kessler, 1877

Benthophilus baeri Kessler [K.F.] 1877:52, Pl. 4 (fig. 10) [The Aralo-Caspian Expedition].

EN: Baer pugolovka.

Type locality: Mangyshlak Peninsula, Kazakhstan; southern Caspian Sea, depth 49-266 feet [7-38 Russian fathoms].

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

215. *Benthophilus casachicus* Ragimov, 1978

Benthophilus stellatus casachicus, Ragimov [D. B.] 1978:725 [705], fig. [Voprosy Ikhtiologii v. 18 (no. 5)] was considered as a valid subspecies by Coad (1995). But now has been considered as valid species, *Benthophilus casachicus* Ragimov, 1978 (Reshetnikov et al. 1997:752, Vasil'eva 1998:127, Bogutskaya et al. 2001:47, Vasil'eva & Miller in Miller 2004:182, Bogutskaya & Naseka 2004:215, Boldyrev & Bogutskaya 2004:132, Boldyrev & Bogutskaya 2007:69, Neilson & Stepien 2009:96, Esmaeili et al. 2010a:376, Jouladeh-Roudbar et al. 2015b:897).

EN: -

Type locality: Kenderli Spit, eastern shore of the middle Caspian Sea, depth 36 meters.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

Comment: Reported from the middle and south Caspian Sea by Boldyrev and Bogutskaya (2007) and Naseka & Bogutskaya (2009) but not confirmed by specimens for Iran.

216. *Benthophilus ctenolepidus* Kessler, 1877

Benthophilus ctenolepidus Kessler [K.F.] 1877:48, Pl. 4 (fig. 11) [The Aralo-Caspian Expedition].

EN: Transparent tadpole goby.

Type locality: Caspian Sea, 40°08'N, 0°26'E of Baku, Azerbaijan.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

217. *Benthophilus granulatus* Kessler

Benthophilus granulatus, Kessler [K.F.] 1877:57, Pl. 5 (fig. 14) [The Aralo-Caspian Expedition].

EN: Granular tadpole goby, Granular pugolovka.

Type locality: Baku Bay, Caspian Sea, Azerbaijan.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Comment: Its presence in Iranian waters needs confirmation. Reported by Kottelat & Freyhof (2007).

218. *Benthophilus grimmi* Kessler, 1877

Benthophilus grimmi Kessler [K. F.] 1877:59, Pl. 5 (fig. 13) [The Aralo-Caspian Expedition].

EN: Grimm tadpole goby.

Type locality: Middle and southern Caspian Sea, depth 245-756 feet [35-108 Russian fathoms].

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

Comment: Reported from the middle and south Caspian Sea by Boldyrev and Bogutskaya (2007) and Naseka & Bogutskaya (2009) but not confirmed by specimens for Iran.

219. *Benthophilus kessleri* Berg, 1927

Benthophilus grimmi kessleri var. Berg [L. S.] 1927:343 [Collection of papers in honor of Prof. Knipowitsch].

EN: Kessler tadpole goby.

Type locality: 41°51'N, 52°15'E, depth 75 meters, Caspian Sea.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

Comment: Reported from the middle and south Caspian Sea by Boldyrev & Bogutskaya (2007) and Naseka & Bogutskaya (2009) but not confirmed by specimens for Iran.

220. *Benthophilus leobergius* Berg, 1949

Benthophilus stellatus leobergius Berg [L. S.] 1949:1116, figs. 858-859 [No. 30].

EN: Caspian stellate tadpole goby.

Type locality: Astrabadskiy Bay, Caspian Sea, Iran.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Comment: Originally described as a subspecies of *B. stellatus* (Sauvage, 1874), a taxon now restricted to the Black Sea.

- 221.** *Benthophilus leptocephalus* Kessler, 1877
Benthophilus leptocephalus Kessler [K. F.] 1877:45 [The Aralo-Caspian Expedition].
 EN: Flat-head tadpole goby.
 Type locality: Southern Caspian Sea, depth 756 feet [108 Russian fathoms, 230 meters].
 Distribution: Caspian Sea basin.
 IUCN: Not Evaluated.
 Comment: Reported from the middle and south Caspian Sea by Boldyrev and Bogutskaya (2007) and Naseka & Bogutskaya (2009) but not confirmed by specimens for Iran.
- 222.** *Benthophilus leptorhynchus* Kessler, 1877
Benthophilus leptorhynchus Kessler [K.F.] 1877:56, Pl. 5 (figs. 12-12a) [The Aralo-Caspian Expedition].
 EN: Short-snout tadpole goby, Short-snout pugolovka.
 Type locality: Middle Caspian Sea, depth 490 feet [70 Russian fathoms].
 Distribution: Caspian Sea basin.
 IUCN: Not Evaluated.
 Comment: Reported from the middle and south Caspian Sea by Boldyrev and Bogutskaya (2007) and Naseka & Bogutskaya (2009) but not confirmed by specimens for Iran.
- 223.** *Benthophilus macrocephalus* (Pallas, 1787)
Gobius macrocephalus Pallas [P.S.] 1787:352, Pl. 10 (figs. 4-6) [Nova Acta Academiae Scientiarum Imperialis Petropolitanae v. 1 (Mém.) (for 1783)].
 EN: Caspian tadpole goby, bighead tadpole goby.
 Type locality: Mare Caspicum [Caspian Sea]. No types known.
 Distribution: Caspian Sea basin.
 IUCN: Least Concern.
- 224.** *Benthophilus mahmudbejovi* Ragimov, 1976
Benthophilus mahmudbejovi Ragimov [D. B.] 1976:1196, fig. [Zoologicheskii Zhurnal v. 55 (no. 8)].
 EN: Small-spine tadpole goby
 Type locality: Off Cape Peschanyy, middle Caspian Sea, Kazakhstan, depth 40 meters.
 Distribution: Caspian Sea basin.
 IUCN: Least Concern.
 Comment: Reported from the Middle and south Caspian Sea by Boldyrev & Bogutskaya (2007) and Naseka & Bogutskaya (2009) but not confirmed by specimens for Iran.
- 225.** *Benthophilus pinchuki* Ragimov, 1982
Benthophilus ctenolepidus pinchuki Ragimov [D. B.] 1982:49 [Zoologicheskii Zhurnal v. 61 (no. 1)].
 EN: Pinchuk tadpole goby.
 Type locality: Off Belyy Bugor, 37°40'N, southeastern Caspian Sea, Turkmenistan, depth 30 meters. Holotype: ZISP 53569 [ex IZA].
 Distribution: Caspian Sea basin.
 IUCN: Not Evaluated.
 Comment: Formerly was considered as a subspecies of *B. ctenolepidus*.
- 226.** *Benthophilus ragimovi* Boldyrev & Bogutskaya, 2004
Benthophilus ragimovi Boldyrev [V.S.] & Bogutskaya [N.G.] 2004:132, fig. 2 [Zoo-systematica Rossica v. 13 (no. 1)].
 EN: Ragimov's tadpole goby.
 Type locality: Western coast of Caspian Sea, off Yamma-Kilyazi, Azerbaijan, depth 50 meters.
 IUCN: Not Evaluated.
 Distribution: Caspian Sea basin.
 Comment: Reported from the Middle and south Caspian Sea by Boldyrev & Bogutskaya (2007) and Naseka & Bogutskaya (2009) but not confirmed by specimens for Iran.
- 227.** *Benthophilus spinosus* Kessler, 1877
Benthophilus spinosus Kessler [K.F.] 1877:

50 [The Aralo-Caspian Expedition].

EN: Spiny tadpole goby, Spiny pugolovka.

Type locality: Middle Caspian Sea, depth 140 feet [20 Russian fathoms].

Comment: Reported from the Middle and south Caspian Sea by Boldyrev & Bogutskaya (2007) and Naseka & Bogutskaya (2009) but not confirmed by specimens for Iran.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

228. *Benthophilus svetovidovi* Pinchuk & Ragimov, 1979

Benthophilus svetovidovi Pinchuk [V. I.] & Ragimov [D. B.] 1979:515, fig'd [Zoologicheskii Zhurnal v. 58 (no. 4)].

EN: Svetovidov's tadpole goby.

Type locality: Caspian Sea, depth 86 meters.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

Comment: Reported from the middle and south Caspian Sea by Boldyrev & Bogutskaya (2007) and Naseka & Bogutskaya (2009) but not confirmed by specimens for Iran.

Genus *Boleophthalmus* Valenciennes, 1837
(1 species)

Boleophthalmus Valenciennes [A.] in Cuvier & Valenciennes, 1837:198. Masc. *Gobius boddarti* Pallas, 1770. Type by subsequent designation. Type designated by Bleeker 1874:328.

Etymology: *Boleophthalmus*: Name from Greek, βο?? for ejected and 'ophthalmos' for eye; refers to species capability to rapidly raise their eyes above the level of their orbital cavities, as if the eyes were being ejected.

229. *Boleophthalmus dussumieri* Valenciennes, 1837

Boleophthalmus dussumieri Valenciennes [A.] in Cuvier & Valenciennes 1837:207, Pl. 354 [Histoire naturelle des poissons v. 12].

EN: Dussumier's mudskipper

Type locality: Mumbai, India.

Distribution: Tigris, Persis, Hormuz and

Makran.

IUCN: Not Evaluated.

Genus *Glossogobius* Gill, 1859 (1 species)

Glossogobius Gill [T.N.] 1859:46. Masc. *Gobius platycephalus* Richardson, 1846. Type by monotypy. Date may be 1860 or 1861.

Etymology: *Glossogobius*: Greek, glossa = tongue + Latin, gobius = gudgeon.

230. *Glossogobius giuris* (Hamilton, 1822) *Gobius giuris* Hamilton [F.] 1822:51, 366, Pl. 33 (fig. 15) [An account of the fishes found in the river Ganges].

EN: Tang Goby.

Type locality: Ganges River, India.

Distribution: Hormuz and Makran.

IUCN: Least Concern.

Genus *Hyrceanogobius* Iljin, 1928 (1 species, 1 unconfirmed)

Hyrceanogobius Iljin [B. S.] 1928:44. Masc. *Hyrceanogobius bergi* Iljin, 1928. Type by monotypy.

Etymology: *Hyrceanogobius*: Composed from Hyrcania, old Persian region near of Caspian Sea + Latin, gobius = gudgeon.

231. *Hyrceanogobius bergi* Iljin, 1928

Hyrceanogobius bergi Iljin [B. S.] 1928:44, figs. 7-11 [Trudy Astrakhanskoi nauchnoi rybokhoziaistvennoi stantsii = Reports of the Astrakhan Scientific Fishery Station v. 6 (no. 3)].

EN: Volga dwarf goby.

Type locality: Northern Caspian Sea, near mouths of rivers Volga, Ural, and Emba, Russia and Kazakhstan.

Comment: Its presence in Iranian waters needs confirmation. Record from Kottelat & Freyhof (2007).

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Genus *Knipowitschia* Iljin, 1927 (3 species, 1 unconfirmed)

Knipowitschia Iljin [B. S.] 1927:129, 131. Fem. *Gobius longicaudatus* Kessler, 1877. Type by monotypy. Also appeared in Iljin 1928:43, and

spelled once as *Knipovitschia*; species also seen as *longicaudatus*.

Etymology: *Knipowitschia*: Because of N.M. Knipowitsch, a zoologist and Russian ichthyologist from the Academy of Sciences.

232. *Knipowitschia caucasica* (Berg, 1916) *Pomatoschistus causicus* Berg [L. S.] (ex Kavraisky) 1916:409 [Les Poissons des eaux douces de la Russie].

EN: Caucasian dwarf goby.

Type locality: Swamp near Batum and Inkit Lake near Pitzunda, Georgia (Eurasia).

Distribution: Caspian Sea basin.

IUCN: Least Concern.

233. *Knipowitschia iljini* Berg, 1931

Knipowitschia iljini Berg [L. S.] 1931:1271, Pl. 1; figs. 1-2 [Izvestia Akademii nauk Soiuzu Sotsialisticheskikh Reespublik. VII Serii, Otdelenie matematischeskikh i estestvennykh nauk = Bulletin de l'Académie des sciences de l'Union des Républiques Sovuétiques Socialistes. VII Série, Classe des sciences + 1931].

EN: Iljin's dwarf goby.

Type locality: Middle part of Caspian Sea.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

234. *Knipowitschia longicaudata* (Kessler, 1877)

Gobius longicaudatus Kessler [K.F.] 1877: 35, Pl. 3 (fig. 8) [The Aralo-Caspian Expedition].

EN: Longtail dwarf goby.

Type locality: Southern and middle Caspian Sea.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Comment: Its presence in Iranian waters needs confirmation. Record from Kottelat & Freyhof (2007).

Genus *Mesogobius* Bleeker, 1874 (2 species, 1 unconfirmed)

Mesogobius (subgenus of *Gobius*) Bleeker [P.] 1874:317. Masc. *Gobius batrachocephalus*

Pallas, 1814. Type by original designation (also monotypic).

Etymology: *Mesogobius*: Greek, mesos = half + Latin, gobius = gudgeon.

235. *Mesogobius nigronotatus* (Kessler, 1877)

Gobius nigronotatus Kessler [K. F.] 1877:31, Pl. 2 (fig. 7) [The Aralo-Caspian Expedition].

EN: Toad goby.

Type locality: Fort Shevchenko [Aleksandrovskiy], Caspian Sea, Kazakhstan, depth 140 feet [20 Russian fathoms]. Holotype (unique): probably not at ZIN.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

Comment: Reported from the middle and south Caspian Sea by Naseka & Bogutskaya (2009) but not confirmed by specimens for Iran. Might be a synonym of *M. nonultimus* (Pinchuk & Miller in Miller, 2004).

236. *Mesogobius nonultimus* (Iljin, 1936)

Gobius nonultimus Iljin [B. S.] 1936:337 [Doklady Akademii Nauk SSSR, Ser. A (Comptes Rendus de l'Académie des Sciences de l'URSS), Leningrad v. 4].

EN: Caspian toad goby.

Type locality: 24 miles southwest of Ulsky Bank, Caspian Sea, depth 24 meters over bottom depth of 54 meters, Turkmenistan.

Holotype (unique): no types known.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

Genus *Neogobius* Iljin, 1927 (3 species)

Neogobius (subgenus of *Gobius*) Iljin [B.S.] 1927:135. Masc. *Gobius fluviatilis* Pallas, 1814. Type by monotypy. Iljin credits genus to Berg as a museum name, but name was made available by Iljin as above.

Etymology: *Neogobius*: Greek, neos = new + Latin, gobius = gudgeon.

237. *Neogobius caspius* (Eichwald, 1831)

Gobius caspius Eichwald [C.E. von] 1831:76 [Zoologia specialis quam expositis

animalibus tum vivis Pars posterior [3].

EN: Caspian goby.

Type locality: Caspian Sea.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

238. *Neogobius melanostomus* (Pallas, 1814)

Gobius melanostomus Pallas [P.S.] 1814: 151 [Zoographia Rosso-Asiatica v. 3].

EN: Round goby, black spotted goby.

Type locality: Sevastopol, Crimea, Ukraine; Balaklava, Ukraine.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

239. *Neogobius pallasii* (Berg, 1916)

Gobius fluviatilis pallasii Berg [L. S.] 1916:417 [Les Poissons des eaux douces de la Russie].

EN: Caspian sand goby.

Type locality: Caspian Sea.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Comment: This taxon was regarded as a subspecies of *N. fluviatilis* (Pallas, 1814).

Genus *Periophthalmus* Bloch & Schneider, 1801 (1 species)

Periophthalmus Bloch [M. E.] & Schneider [J. G.] 1801:63 (xxvii). Masc. *Periophthalmus papilio* Bloch & Schneider, 1801. Type by subsequent designation. Type apparently designated first by Bleeker 1874:326. Genus name misspelled *Periophtalmus* by Cuvier 1831:180.

Etymology: *Periophthalmus*: Greek, peri = around + Greek, ophthalmos = eye.

240. *Periophthalmus waltoni* Koumans, 1955

Periophthalmus waltoni Koumans [F.P.] 1941:288 [Memoirs of the Indian Museum v. 13 (pt 3)].

EN: Walton's mudskipper

Type locality: Iraq and Pakistan.

Distribution: Tigris, Persis, Hormuz and Makran.

IUCN: Not Evaluated.

Genus *Ponticola* Iljin, 1927 (5 species)

Ponticola (subgenus of *Gobius*) Iljin [B. S.] 1927:134. Masc. *Gobius ratan* Nordmann, 1840. Type by subsequent designation. Type designated by Iljin 1930:59].

Comment: Members of this genus were formerly placed in the genus *Neogobius* Iljin, 1927.

241. *Ponticola bathybius* (Kessler, 1877)

Gobius bathybius Kessler [K. F.] 1877:17, Pl. 1 (fig. 3) [The Aralo-Caspian Expedition].

EN: -

Type locality: Svinoi Island, south of Baky, Caspian Sea, Azerbaijan, 756 feet [108 Russian fathoms]. Holotype (unique): No types at ZIN.

Comment: formerly in the genus *Chasar* Vasil'eva, 1996 but Neilson & Stepien (2009). Placed it in the genus *Ponticola* Iljin, 1927.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

242. *Ponticola cyrius* (Kessler, 1874)

Gobius cyrius Kessler [K. F.] 1874:273 [83] [Trudy St.-Peterburgskogo Obscestva Estestvoispytatelej = Travaux de la Société des Naturalistes de St. Pétersbourg. v. 5].

EN: Kura River goby.

Type locality: Kura River near Borzhomi, Georgia, Eurasia.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

243. *Ponticola goebelii* (Kessler, 1874)

Gobius goebelii Kessler [K. F.] 1874:249 [59] [Trudy St.-Peterburgskogo Obscestva Estestvoispytatelej = Travaux de la Société des Naturalistes de St. Pétersbourg. v. 5;].

EN: Caspian ratan or rotan goby.

Type locality: Kura River near Borzhomi, Georgia, Eurasia.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

Comment: Synonym of *Neogobius ratan* (Nordmann 1840), but a valid subspecies *goebelii*- (Berg 1949:1087, Miller in Whitehead et al. 1986:1064 as *gobebeli*, Coad 1995:31, Reshetnikov et al. 1997:756, Vasil'eva 1998:142, Pinchuk et al. 2003:357, Vasil'eva et al. 2015:196). Synonym of *Ponticola ratan* (Nordmann, 1840) (Neilson & Stepien 2009:97).

244. *Ponticola gorlap* (Iljin, 1949): 1091 [No. 30].

EN: Caspian bighead goby.

Type locality: Caspian Sea and tributary rivers.

Distribution: Caspian Sea basin.

Comment: Formerly a subspecies of *Gobius kessleri* Günther, 1861. *Neogobius iljini* Vasil'eva & Vasil'ev, 1996 is a synonym (Kottelat, 1997).

IUCN: Least Concern.

245. *Ponticola iranicus* Vasil'eva, Mousavi-Sabet & Vasil'ev 2015*

Ponticola iranicus Vasil'eva [E. D.], Mousavi-Sabet [H.] & Vasil'ev [V. P.] 2015:191, figs. 2-4 [Acta Ichthyologica et Piscatoria v. 45 (no. 2)].

EN: Persian goby.

Type locality: Upper Sefid-Rud, River basin, Tutkabon Stream, 36°50.756'N, 49°35.021' E.

Distribution: Caspian Sea basin.

IUCN: Not Evaluated

246. *Ponticola syrman* (Nordmann, 1840)

Gobius syrman Nordmann [A. von] 1840:419, Pl. 12 (fig. 1) [Voyage dans la Russie méridionale et la Crimée]

EN: Syrman goby.

Type locality: Odessa, Ukraine; Kryni, Ukraine.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Comment: *Ponticola syrman eurystomus* (Kessler, 1877) has been considered as subspecies and its taxonomic status needs

further study.

Genus *Proterorhinus* Smitt, 1900 (1 species)
Proterorhinus (subgenus of *Gobius*) Smitt [F. A.] 1900:544. Masc. *Gobius marmoratus* Pallas, 1814. Type by monotypy. Synonym of *Gobius* Linnaeus, 1758, but a valid subgenus *Proterorhinus* as described- (Vasil'eva 1999: 161).

Etymology: *Proterorhinus*: Greek, proteros = former + Greek, rhinos = nose.

247. *Proterorhinus nasalis* (De Filippi, 1863)

Gobius nasalis De Filippi [F.] 1863:390 [Archivio per la Zoologia, l'Anatomia e la Fisiologia. v. 2].

EN: Eastern tubenose goby.

Type locality: Caspian Sea near Baku.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Comment: Previously recognised as *P. marmoratus* (Pallas, 1814); some authors consider it a synonym of this species.

Genus *Rhinogobius* Gill, 1859 (1 species)

Rhinogobius Gill [T. N.] 1859:145. Masc. *Rhinogobius similis* Gill, 1859. Type by monotypy.

Etymology: *Rhinogobius*: Greek, rhinos = nose + Latin, gobius = gudgeon.

248. *Rhinogobius similis* Gill 1859**

Rhinogobius similis Gill [T. N.] 1859:145 [Proceedings of the Academy of Natural Sciences of Philadelphia v. 11].

EN: Pond or lake goby.

Type locality: The Hongo Bridge, Inouzawa-gawa River, Shimoda, southern Izu Peninsula, Shizuoka Prefecture, Japan, 34°41'36.63"N, 138°56'26.25"E. Old locality: Shimoda, Izu Province, Japan.

Distribution: Caspian Sea, Urmia Lake and Hari basins. Reported from Anzali wetland by K.A (see, Esmaeili et al. 2014c) and Urmia by Eagderi & Moradi (2017).

IUCN: Not Evaluated.

Comments: The identity of introduced *Rhinogobius* in Iran needs to be confirmed.

Vasil'eva (2007) and Vasil'eva & Kuga (2008) have identified the introduced Central Asian species as *R. cheni* (Nichols, 1931).

Genus *Scartelaos* Swainson, 1839 (1 species)
Scartelaos Swainson [W.] 1839:183, 279. Masc. *Gobius viridis* Hamilton, 1822. Type by monotypy. Hoese & Larson 2006:1682 indicate that the type is by subsequent designation of Bleeker 1874.

Etymology: *Scartelaos* is probably a compound name from the Greek 'skarthmos' (leaping), and 'laos' (people, folk), which maybe refers to the typical tail-stand of males during courtship.

249. *Scartelaos tenuis* (Day, 1876)
Boleophthalmus tenuis Day [F.] 1876:305, Pl. 65 (fig. 1) [The fishes of India Part 2].
EN: Indian Ocean slender mudskipper.
Type locality: Estuaries of Karachi, Sind, Pakistan.
Distribution: Tigris, Persis, Hormuz and Makran.
IUCN: Not Evaluated.
Comment: Originally described as *Boleophthalmus tenuis* Day, 1876 from Estuaries of Karachi, Sind, Pakistan. It is found on mud flats with *Boleophthalmus dussumieri* and *Periophthalmus waltoni* in Helleh estuary.

Order Mugiliformes (1 family, 4 genera and 6 species)

Family Mugilidae (3 genera and 6 species)
Comment: Mitochondrial phylogeny of grey mullets (Mugilidae) has been recently given by Durand & Borsa (2015):

Moolgarda seveli and *Valamugil buchhanani* have been placed together with *Crenimugil crenilabis* under *Crenimugil*, and *Moolgarda cunnesius*, *Moolgarda engeli*, *Moolgarda perusii*, and *Valamugil robustus* have been placed under the resurrected genus *Osteomugil*; likewise, *Liza aurata*, *Liza bandialensis*, *Liza dumerili*, *Liza ramada*, *Liza richardsonii*, *Liza saliens*, and *Liza tricuspiciens* have been placed

together with *Chelon labrosus* under *Chelon*; likewise, *Chelon macrolepis*, *Chelon melinopterus*, *Chelon subviridis*, *Liza abu*, *Liza affinis*, *Liza alata*, and *Liza haematocheila* have been placed under the resurrected genus *Planiliza*; *C. planiceps* has since then been synonymized with *Liza tade* and placed under *Planiliza*; also, *Sicamugil cascasia*, *Agonostomus monticola*, *Liza argentea*, *Rhinomugil nasutus*, and *Oedalechilus labiosus* have been placed, respectively, under the resurrected genera *Minimugil*, *Dajaus*, *Gracilimugil*, *Squalomugil*, and *Plicomugil* whereas *Xenomugil thoburni* has been placed under *Mugil*; the genus names *Liza*, *Moolgarda*, *Valamugil* and *Xenomugil* have been dismissed; three new genera have been erected: *Neochelon* (for *Liza falcipinnis*), *Parachelon* (for *Liza grandisquamis*), and *Pseudomyxus* (for *Myxus capensis*).

Genus *Chelon* Artedi, 1793 (2 species)
Chelon Artedi [P.] in Röse 1793:118. Masc. *Mugil chelo* Cuvier 1829. Type by subsequent designation. Type species designated (though tentatively) by Jordan 1917:52.

Etymology: *Chelon*: Greek, chelone = turtle.
250. *Chelon aurata* (Risso, 1810)**
Mugil auratus Risso [A.] 1810:344 [Ichthyologie de Nice].
EN: Golden grey mullet.
Type locality: Nice, France, northwestern Mediterranean Sea. No types known.
Distribution: Introduced to the Caspian Sea basin.
IUCN: Least Concern.
Comment: Formerly placed in the genus *Liza* but Durand & Borsa (2015) placed it in the genus *Chelon*.

251. *Chelon saliens* (Risso, 1810)**
Mugil saliens Risso [A.] 1810:345 [Ichthyologie de Nice].
EN: Leaping mullet.
Type locality: Nice, northwestern Mediterranean Sea. No types known.
Distribution: Introduced to the Caspian Sea

basin.

IUCN: Least Concern.

Comment: Formerly placed in the genus *Liza* but Durand & Borsa (2015) placed it in the genus *Chelon*.

Genus *Ellochelon* Whitley, 1930 (1 species)

Ellochelon Whitley [G.P.] 1930:251. Masc. *Mugil vaigiensis* Quoy & Gaimard, 1825. Type by original designation (also monotypic).

252. *Ellochelon vaigiensis* (Quoy & Gaimard 1825)

Mugil vaigiensis Quoy [J. R. C.] & Gaimard [J. P.] 1825:337, Pl. 59 (fig. 2).

EN: Squaretail mullet.

Type locality: Waigiou [Pulau Waigeo, Papua Barat Province, Indonesia, western Pacific.

Comment: *Liza vaigiensis* (Quoy & Gaimard, 1824) and *Mugil vaigiensis* Quoy & Gaimard, 1825 are synonyms.

Distribution: Tigris; possibly other coastal rivers in the Persian Gulf.

IUCN: Least Concern.

Genus *Mugil* Linnaeus, 1758 (1 species)

Mugil Linnaeus [C.] 1758:316. Masc. *Mugil cephalus* Linnaeus, 1758. Type by monotypy. On Official List (Opinion 75). *Mugie* Macklot 1830 on Official Index as an incorrect subsequent spelling (Direction 56).

253. *Mugil cephalus* Linnaeus, 1758 :

Mugil cephalus Linnaeus [C.] 1758:316 [Systema Naturae, Ed. X v. 1].

EN: Flathead Mullet.

Type locality: European sea, Europe.

Distribution: The Caspian Sea (Exotic), Tigris and Makran basins; possibly other coastal rivers in the Persian Gulf.

IUCN: Not Evaluated.

Comments: Jolodar & Abdoli (2004) and Yelghi et al. (2012) reported it from the Gomishan Lagoon but only in farms there. According to Yelghi et al. (2012) the grey mullet fingerling were imported to Iran in 1997 from Hong Kong and in coastal fish pond of northern part of Iran were

successfully cultured in order to obtain broodstocks and induce artificial reproduction.

Genus *Planiliza* Whitley, 1945 (2 species)

Planiliza (subgenus of *Moolgarda*) Whitley [G.P.] 1945:17. Fem. *Moolgarda* (*Planiliza*) *ordensis* Whitley, 1945. Type by original designation (also monotypic).

254. *Planiliza abu* (Heckel, 1843)

Mugil abu Heckel [J. J.] 1843:1097 [107] [Ichthyologie [von Syrien]. In Russegger v. 1 (pt 2).

EN: Abu mullet.

Type locality: Tigris River, near Mosul, Iraq. Distribution: Tigris, Persis and Hormuz; possibly introduced in the Lake Maharlu basin.

IUCN: Least Concern.

Comments: Formerly placed in the genus *Liza* but Durand & Borsa (2015) placed it in the genus *Planiliza*.

Mugil pseudotelestes Pietschmann, 1912 and *Mugil hishni* Misra, 1943 are synonyms. The subspecies *Mugil abu zarudnyi* Berg, 1949 from Iran is of doubtful validity.

255. *Planiliza subviridis* (Valenciennes, 1836)

Mugil subviridis Valenciennes [A.] in Cuvier & Valenciennes 1836:115 [Histoire naturelle des poissons v. 11].

EN: Greenback mullet.

Type locality: Ganges River, Malabar, India. Distribution: Tigris and Persis.

IUCN: Not Evaluated.

Comments: Formerly placed in the genus *Liza* but Durand & Borsa (2015) and Xia et al. (2016) placed it in the genus *Planiliza*.

Order Cichliformes (1 family, 4 genera and 6 species) (see Nelson et al. 2016).

Family Cichlidae (4 genera and 6 species)

Genus *Amatitlania* Schmitter-Soto 2007 (1 species)

Amatitlania Schmitter-Soto [J.J.] 2007:48. Fem. *Heros nigrofasciatus* Günther, 1867.

Type by original designation.

256. *Amatitlania nigrofasciata* (Günther 1867)**

Heros nigrofasciatus Günther [A.] 1867:601 [Proceedings of the Zoological Society of London 1866 (pt 3)].

EN: Convict cichlid.

Type locality: Lake Amatitlán, Guatemala.

Distribution: Reported from headwater of Kol River (Hormuz) (Esmaeili et al. 2013) and Soleymaniyeh spring, Namak Lake basin (Mousavi-Sabet & Eagderi 2016). It seems that the population from Kol River has been established due to its presence till Feb. 2017.

IUCN: Not Evaluated.

Genus *Coptodon* Gervais 1853 (1 species)

Coptodon Gervais [F. L. P.] 1853:8. Masc.

Acerina zillii Gervais, 1848. Type by original designation (also monotypic). Also appeared as new in Gervais 1853:80; there twice misspelled as *Coptodus*. Earliest publication not researched.

Etymology: *Coptodon*: Bechuana, African native thiape = fish.

257. *Coptodon zillii* (Gervais, 1848)**

Acerina zillii Gervais [F. L. P.] 1848:203 [Annales des Sciences Naturelles, Paris (Zoologie) (Sér. 3) v. 10].

EN: Zill's tilapia, redbelly tilapia.

Type locality: Artesian well, Tuggurth, Algeria [North Africa].

Distribution: Tigris. Reported from the Shadegan wetland, (Jarahi River) which drains into the Persian Gulf (Khaefi et al. 2014).

IUCN: Not Evaluated.

Comment: *Tilapia zillii* (Gervais, 1848) [sometimes as *zilli*] is a synonym.

Genus *Iranocichla* Coad, 1982 (3 species)

Iranocichla Coad [B. W.] 1982:28. Fem.

Iranocichla hormuzensis Coad, 1982. Type by original designation (also monotypic).

Etymology: *Irano*: Iran, the country of origin of species + *Cichla*: Cichlidae, the family to which it belongs.

258. *Iranocichla hormuzensis* Coad, 1982*

Iranocichla hormuzensis Coad [B.W.] 1982: 29, figs. 1-3 [Copeia 1982 (no. 1)].

EN: Hormuz cichlid.

Type locality: Mehran River, Hormozdgan Province, southern Iran, 27°04'N, 54°35'E.

Distribution: Mehran River (Hormuz).

IUCN: Not Evaluated.

259. *Iranocichla persa* Esmaeili, Sayyadzadeh & Seehausen 2016*

Iranocichla persa Esmaeili [H.R.], Sayyadzadeh [G.] & Seehausen [O.] 2016:144, figs. 3-5 [ZooKeys v. 636].

EN: Persis cichlid.

Type locality: Hormuzgan province, Shur River approx. 30 km east of Bandar Abbas, Iran, 27°17'40.10"N, 56°29'15.68"E.

Distribution: Shur, Hasanlangi and Minab River drainages flowing into the Persian Gulf at the Strait of Hormuz.

IUCN: Not Evaluated.

260. *Iranocichla* sp.*

Hormuz (Kol River drainages, see Schwarzer et al. 2016).

Genus *Oreochromis* Günther, 1889 (1 species)

Oreochromis Günther [A.] 1889:70. Masc.

Oreochromis hunteri Günther, 1889. Type by monotypy.

Etymology: *Oreochromis*: Latin, aurum = gold + Greek, chromis = a fish, perhaps a perch.

261. *Oreochromis aureus* (Steindachner, 1864)**

Chromis aureus Steindachner [F.] 1864:229, Pl. 8 (fig. 5) [Verhandlungen der K.-K. zoologisch-botanischen Gesellschaft in Wien v. 14].

EN: Blue tilapia.

Type locality: West Africa.

Distribution: Tigris (Arvand and Karun River drainages).

IUCN: Not Evaluated.

Order Atheriniformes (1 family, 1 genus and

1 species)

Family Atherinidae (1 genus and 1 species)

Genus *Atherina* Linnaeus, 1758 (1 species)

Atherina Linnaeus [C.] 1758:315. Fem. *Atherina hepsetus* Linnaeus, 1758. Type by monotypy. Spelled *Atherine* by Berkenhout 1789:82. On Official List (Opinion 75).

Etymology: *Atherina*: Greek, atherina, the Greek name for the eperlane.

262. *Atherina caspia* Eichwald, 1831

Atherina presbyter caspia var. Eichwald [C.E. von] 1831:72 [Zoologia specialis quam expositis animalibus tum vivis Pars posterior [3].

EN: Caspian silverside.

Type locality: Caspian Sea. No types known. Comment: *Atherina presbyter var. caspia* Eichwald, 1831 was recognised as the taxon in Iran, later synonymised with *Atherina boyeri* Risso, 1810, but now considered distinct (Naseka & Bogutskaya 2009) and this is followed by Esmaeili et al. (2014b) and Jouladeh-Roudbar et al. (2015b).

Distribution: Caspian Sea basin.

IUCN: Not Evaluated.

Order Cyprinodontiformes (2 families, 4 genera and 17 species)

Family Cyprinodontidae (1 genus and 14 species)

Genus *Aphanius* Nardo, 1827

Aphanius Nardo [G.D.] 1827:34, 39-40. Masc. *Aphanius nanus* Nardo, 1827. Type by subsequent designation. Also in Isis, v. 20:482 (seen). Type designated by Jordan 1917:121. Proposal submitted to the ICZN to conserve this name (Kottelat & Wheeler 2001:110); conserved in Opinion 2057. Name was placed on the Official List of Specific Names in Zoology (Opinion 2057).

Comment: *Lebias* Goldfuss [G.A.] 1820. Masc. *Lebias fasciata* Valenciennes 1821. Type by subsequent designation. Formerly placed in the genera *Lebias* Goldfuss, 1820 or *Cyprinodon* Lacepède, 1809.

263. *Aphanius arakensis* Teimori, Esmaeili, Gholami, Zarei & Reichenbacher, 2012*

Aphanius arakensis Teimori [A.], Esmaeili [H. R.], Gholami [Z.], Zarei [N.] & Reichenbacher [B.] 2012:62, figs. 2A, B, 5 [ZooKeys No. 215].

EN: Arak tooth-carp.

Type locality: small pond, Namak Lake basin, 34°00'N, 49°50'E, 5 km southeast of the city of Arak, Iran, elevation 1786 meters. Holotype: ZM-CBSU 10999.

Distribution: Namak Lake basin.

IUCN: Not Evaluated.

264. *Aphanius darabensis* Esmaeili, Teimori, Gholami & Reichenbacher, 2014*

Aphanius darabensis Esmaeili [H. R.], Teimori [A.], Gholami [Z.] & Reichenbacher [B.] 2014:254, figs. 2-3, 4A-E [Zootaxa 3786 (no. 3)].

EN: Darab tooth-carp, Kol tooth-carp.

Type locality: Fars, Darab, Korsiah Banaki spring-stream system, Kol River, 28°46'24.96"N, 54°23'35.48"E, Iran, altitude 1027m. Holotype: ZM-CBSU 9713. Distribution: Hormuz (Kol River drainages).

IUCN: Not Evaluated.

265. *Aphanius dispar* (Rüppell, 1829) 1829: *Lebias dispar* Rüppell [W.P.E.S.] 1829:66, Pl. 18 (figs. 1-2) [Atlas zu der Reise im nördlichen Africa. Fische des Rothen Meeres.

EN: common tooth-carp (Fig. 38).

Type locality: Red Sea. Lectotype: SMF 821. Paralectotypes: BMNH 1860.11.9.152 (3) Abyssinia, Rüppell coll., SMF 1988 (10). Lectotype designated by Villwock et al. 1983:246.

Distribution: Tigris, Persis, Hormuz, Makran, Hamun-e Jaz Murian and Mashkid. IUCN: Least Concern.

266. *Aphanius farsicus* Teimori, Esmaeili & Reichenbacher 2011*

Aphanius farsicus, Teimori [A.], Esmaeili [H.R.] & Reichenbacher [B.] 2011:55, figs. 2-3 [Zootaxa No. 3096].

EN: Fars tooth-carp.

Type locality: Spring on the edge of Shiraz [Maharlu] Lake, southern Iran. Syntypes: ZSI F9403-04 (2).

Distribution: Lake Maharlu basin.

IUCN: Not Evaluated. But should be

considered as critically Endangered.

Comment: Replacement name for *Aphanius persicus* (Jenkins, 1910), preoccupied by *Aphanius persicus* (Priem, 1908) in fossil fishes.



Fig. 37. *Paraschistura nielseni*, upstream of Helleh River, Persis, Persian Gulf basin (H.R. Esmaeili).

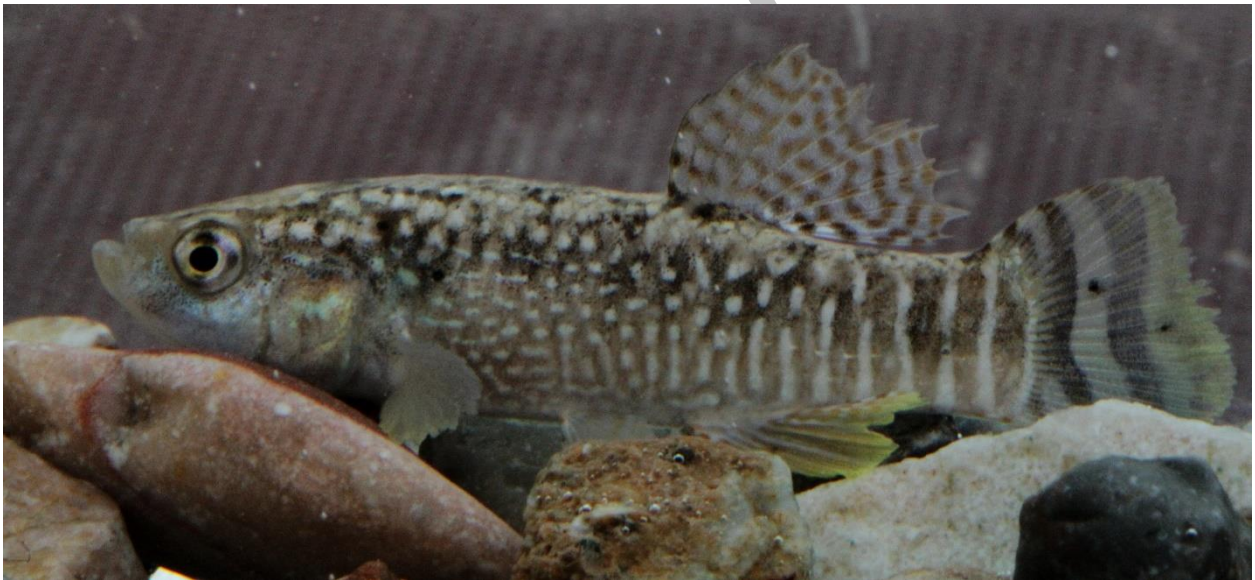


Fig. 38. *Aphanius dispar*, male, Mond River, Persis, Persian Gulf basin (H.R. Esmaeili).

267. *Aphanius furcatus* Teimori, Esmaeili, Erpenbeck & Reichenbacher, 2014*

Aphanius furcatus Teimori [A.], Esmaeili [H.R.], Erpenbeck [D.] & Reichenbacher [B.] 2014:329, figs. 2a-b, 3, 4a-d, 5a-e, 6a [Zoologischer Anzeiger v. 253].

EN: Scaleless tooth-carp.

Type locality: Shur River, along the

BandarAbbas–Minab road, 20km East of Bandar Abbas 27°19'37.6"N, 56°28'10.2"E altitude 2m), Iran, Hormuzgan province, collected on 26th September 2010 by A. Teimori, H.R. Esmaeili, A. Gholamifard and R. Khaefi.

Distribution: Hormuz (Kol and Mehran River drainages) and Makran basin.

IUCN: Not Evaluated. But should be considered as Least Concern.

268. *Aphanius ginaonis* (Holly, 1929)*

Cyprinodon ginaonis Holly [M.] 1929:63 [2] [Anzeiger der Akademie der Wissenschaften in Wien, Mathematisch Naturwissenschaftliche Klasse v. 66 (no. 7)].

EN: Geno (Genow) tooth-carp.

Type locality: Hot spring at Ginao (Genow), north of Bandar Abbas, southeastern Iran.

Syntypes: (3 in original) NMW 13800-03 (1, 1, 1). On p. 2 of separate.

Distribution: Hormuz basin.

IUCN: Not Evaluated.

269. *Aphanius isfahanensis* Hrbek, Keivany & Coad, 2007*

Aphanius isfahanensis Hrbek [T.], Keivany [Y.] & Coad [B.W.] 2006:245, figs. 2A, B [Copeia 2006 (no. 2)].

EN: Esfahan tooth-carp.

Type locality: Zayandeh Rud (Zayandeh River) at Varzaneh Bridge, 32°25'32"N, 52°39'14E, Isfahan Province, Iran.

Holotype: CMNFI 2004-0001.

Distribution: Zayandeh Rud (Esfahan) basin.

IUCN: Not Evaluated.

270. *Aphanius kavirensis* Esmaeili, Teimori, Gholami & Reichenbacher 2014*

Aphanius kavirensis Esmaeili [H.R.], Teimori [A.], Gholami [Z.] & Reichenbacher [B.] 2014:259, figs. 4F-J, 6-7 [Zootaxa 3786 (no. 3)].

EN: Kavir tooth-carp.

Type locality: Semnan, Damghan, Cheshmeh Ali Spring, Kavir Basin, 36°16'45.6"N, 54°05'01.6"E, Iran, altitude 1569 meters. Holotype: ZM-CBSU 9587a.

Distribution: Kavir basin.

IUCN: Not Evaluated. However, it is found only in one locality (type locality) with low number of individuals.

271. *Aphanius mento* (Heckel, 1843)

Lebias mento Heckel [J. J.] 1843:1089 [99] [Ichthyologie [von Syrien]. In Russegger v. 1 (pt 2).

EN: Iridescent toothcarp.

Type locality: Mossul, northern Iraq (36°18'N, 43°18'E). Possible syntypes: NMW 21699-704 (6), 59832 (21).

Distribution: Tigris.

IUCN: Least Concern.

Comment: *Lebias cypris* Heckel, 1843 is a synonym.

272. *Aphanius mesopotamicus* Coad, 2009

Aphanius mesopotamicus Coad [B.W.] 2009:150, fig. 1 [ZooKeys No. 31].

EN: Mesopotamian toothcarp

Type locality: Khuzestan, canal branch of Karkheh River, 31°40'N, 48°35'E, Iran.

Holotype: CMNFI 1979-0360A.

Distribution: Tigris (Karkheh and Jarrahi Rivers).

IUCN: Not Evaluated.

273. *Aphanius pluristriatus* (Jenkins 1910)*

Cyprinodon pluristriatus Jenkins [J.T.] 1910:125, Pl. 6 (fig. 5) [Records of the Indian Museum (Calcutta) v. 5 (art. 12)].

EN: Mond tooth-carp.

Type locality: East of Shiraz, stream running to Fussa [Fasa], southern Iran, elevation 5000 feet. Syntypes: ZSI F9408-9411 (4), F9412 (?).

Distribution: Mond river tributaries (Persis).

IUCN: Not Evaluated.

274. *Aphanius shirini* Gholami, Esmaeili, Erpenbeck & Reichenbacher, 2014*

Aphanius shirini Gholami [Z.], Esmaeili [H. R.], Erpenbeck [D.] & Reichenbacher [B.] 2014:132, figs. 3a-b [Journal of Zoological Systematics and Evolutionary Research = Zeitschrift für zoologische Systematik und Evolutionsforschung v. 52 (no. 2)].

EN: Shirin tooth-carp.

Type locality: Paselari spring of the Khosroshirin spring-stream system, Khosroshirin Village, Abadeh City, Fars,

uppermost reaches of Kor River Basin, 30°53'29.5"N, 52°00'36.8"E, Iran, altitude 2327 meters. Holotype: ZM-CBSU, ZG151. Distribution: Endemic to the Kor River basin but has been translocated to the Helleh River drainage (Persis).

IUCN: Not Evaluated.

275. *Aphanius sophiae* (Heckel, 1849)*

Lebias sophiae Heckel [J. J.] 1847:267, Pl. 22 [Reisen in Europa, Asien und Africa v. 2 (pt 3)].

EN: Kor tooth-carp.

Type locality: Accepted locality: endorheic Kor River basin north of Shiraz, Fars Province, Iran. Kor River basin.

Distribution: Endemic to the Kor River basin but has been translocated to the Persis and Tigris.

IUCN: Not Evaluated.

Comments: *Lebias punctatus* Heckel, 1849, *Lebias crystalodon* Heckel, 1849 and possibly *Cyprinodon blanfordii* Jenkins, 1910 are synonyms.

276. *Aphanius vladykovi* Coad, 1988*

Aphanius vladykovi Coad [B.W.] 1988:115, fig. 1 [Environmental Biology of Fishes v. 23 (no. 1-2)].

EN: Zagros tooth-carp.

Type locality: Large pool in Shahrestan-e Bakhtiari va Chahar Mahall, 3km west of Boldaji, Iran, 31°57'N, 51°01'E, elevation about 2380m. Holotype: NMC 79-0247.

Distribution: Tigris.

IUCN: Not Evaluated.

Family Poeciliidae (3 genera and 3 species)

Genus *Gambusia* Poey, 1854 (1 species)

Gambusia Poey [F.] 1854:382, 390. Fem. *Gambusia punctata* Poey, 1854. Type by subsequent designation. Type apparently designated first by Bleeker 1864:140, also by Jordan & Copeland 1877:142. On Official List (Opinion 375).

Etymology: *Gambusia*: *Gambusia*: From the Cuban term, *Gambusino*, which means

"nothing", usually in the context of a joke or a farce. Fishing for gambusinos = when one catches nothing.

277. *Gambusia holbrooki* Girard, 1859**

Gambusia holbrooki Girard [C.F.] (ex Agassiz) 1859:62 [Proceedings of the Academy of Natural Sciences of Philadelphia v. 11].

EN: Eastern mosquitofish (Fig. 39).

Type locality: Palatka, eastern Florida; Charleston, South Carolina, U.S.A. Syntypes: ANSP 6976-77 (2) Palatka, MCZ 35999 [ex USNM 8301] (5) Charleston, USNM 8301 (45).

Distribution: Introduced to all basins.

IUCN: Least Concern.

Genus *Poecilia* Bloch & Schneider 1801 (1 species)

Poecilia Bloch [M.E.] & Schneider [J.G.] 1801: 452. Fem. *Poecilia vivipara* Bloch & Schneider, 1801. Type by subsequent designation [not by monotypy]. Type designated by Bleeker 1864:140. Spelled *Paecilia* by McClelland 1839:300.

Etymology: *Poecilia*: Greek, poikilos = with a lot of colours.

278. *Poecilia reticulata* Peters, 1859**

Poecilia reticulata Peters [W. (C. H.)] 1859:412 [Monatsberichte der Königlichen Preussischen Akademie der Wissenschaften zu Berlin 1859].

EN: Guppy.

Type locality: Guayre River, Caracas, Venezuela.

Distribution: Namak basin.

IUCN: Not Evaluated.

Genus *Xiphophorus* Heckel, 1848 (1 species)

Xiphophorus Heckel [J. J.] 1848:291. Masc. *Xiphophorus hellerii* Heckel, 1848. Type by subsequent designation. Type designated by Bleeker 1864:140, also by Günther 1866:349. Etymology: *Xiphophorus*: Greek, xiphos = sword + Greek, pherein = to carry.

279. *Xiphophorus hellerii* Heckel, 1848**

Xiphophorus hellerii Heckel [J. J.]



Fig. 39. Male and female specimens of *Gambusia holbrooki*, a non-native introduced species to Mond River, Persis, Persian Gulf basin (H.R. Esmaeili).



Fig. 40. *Syngnathus caspius*, Caspian Sea (K. Abbasi).

1848:291, Pl. 8 (figs. 1-3) [Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften. Mathematisch-Naturwissenschaftliche Classe v. 1 (pt 1-5) [1848].

EN: Green swordtail.

Type locality: Orizaba, Mexico [Atlantic].
Syntypes: NMW 60543 (8).

Distribution: Introduced to the Namak Lake and Persis.

IUCN: Not Evaluated.

Order Synbranchiformes (1 family, 1 genus and 1 species)

Family Mastacembelidae (1 genus and 1 species)

Comment: Mastacembelinae Swainson, 1839: 175 (type genus: *Mastacembelus* Scopoli, 1777: 458; *Mastecembelus* is an erroneous subsequent spelling; correct stem is *Mastacembel*– and correct spelling is Mastacembelidae).

Genus *Mastacembelus* Scopoli, 1777 (1 species)

Mastacembelus Scopoli [J.A.] (ex Gronow) 1777:458. Masc. *Ophidium* [sic] *mastacembelus* Banks & Solander, 1794. Type apparently by subsequent monotypy. Appeared first without species; addition of species not researched. Scopoli's spelling is *Mastocembelus* on Gronow's 1763 unavailable [*Mastacembelus*]; Scopoli's spelling regarded

as in error (see Sufi 1956:106.

Etymology: *Mastacembelus*: Greek, mastax, -agos = bite + Greek, emballo = to throw oneself.

280. *Mastacembelus mastacembelus* (Banks & Solander, 1794):

Ophidium mastacembelus Banks [J.] & Solander [D.C.] in Russell 1794:209, Pl. 6 [Natural History of Aleppo. Second Edition v. 2].

EN: Mesopotamian spiny eel.

Type locality: Kowick River, Aleppo [Quwayq River, Halab, Syria].

Comment: *Rhynchobdella haleppensis* Bloch & Schneider, 1801 is a synonym. *Mastacembelus aleppensis* Günther, 1861 is an unjustified emendation of *haleppensis*.

Distribution: Tigris, Kor and Persis. Its presence from the Kor River should be confirmed by specimen.

IUCN: Least Concern.

Order Anabantiformes

Family Channidae (1 genus and 1 species)

Genus *Channa* Scopoli, 1777 (1 species)

Channa Scopoli [J. A.] (ex Gronow) 1777:459.

Fem. *Channa orientalis* Bloch & Schneider, 1801. Type by subsequent monotypy. Appeared without species; first addition of species apparently one treated by Bloch & Schneider 1801:496, lvi].

281. *Channa gachua* (Hamilton, 1822)

Ophicephalus gachua Hamilton [F.] 1822:68, 367, Pl. 21 (fig. 21) [An account of the fishes found in the river Ganges].

EN: Dwarf snakehead

Type locality: Ponds and ditches of Bengal.

Distribution: Hamun-e Jaz Murian, Makran and Mashkid basins.

IUCN: Least Concern.

Comment: Formerly in the genus *Ophicephalus*.

Order Syngnathiformes (1 family, 1 genus and 1 species)

Family Syngnathidae (1 genus and 1 species)

Genus *Syngnathus* Linnaeus, 1758 (1 species)

Syngnathus Linnaeus [C.] 1758:336. Masc.

Syngnathus acus Linnaeus 1758. Type by subsequent designation. Type designated by Fowler 1906:93, predating Jordan 1912:103 as given by ICZN; on Official List (Opinion 77, Direction 56).

Etymology: *Syngnathus*: Greek, syn, symphysis = grown together + Greek, gnathos = jaw.

282. *Syngnathus caspius* Eichwald, 1831

Syngnathus caspius Eichwald [C.E. von] 1831:61 [Zoologia specialis quam expositis animalibus tum vivis Pars posterior [3]].

EN: Caspian pipefish.

Type locality: Balkhan Bay, Caspian Sea.

Syntypes: whereabouts unknown.

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Comment: *Syngnathus nigrolineatus caspius* Eichwald, 1831 was considered to be the taxon in Iran, later synonymised with *Syngnathus abaster* Risso, 1827 but now recognised as distinct (Naseka & Bogutskaya 2009). Betancur et al. (2013) and Nelson et al. (2016) placed Syngnathidae in order Syngnathiformes.

Order Perciformes (1 family, 2 genera 3 species)

Family Percidae (2 genera and 3 species)

Genus *Perca* Linnaeus, 1758 (1 species)

Perca Linnaeus [C.] 1758:289. Fem. *Perca fluviatilis* Linnaeus, 1758. Type by subsequent designation. Type designated by Gill 1861:48. On Official List (Opinion 77, Direction 56).

Etymology: *Perca*: Greek, perke = perch, a fish without identification.

283. *Perca fluviatilis* Linnaeus, 1758

Perca fluviatilis Linnaeus [C.] 1758:289 [Systema Naturae, Ed. X v. 1].

EN: Perch.

Type locality: Europe. Syntypes: BMNH 1853.11.12.3 [Gronovius coll.] (1, skin), LS 1 (right half-skin).

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Genus *Sander* Oken, 1817 (2 species)

Sander Oken [L.] (ex Cuvier) 1817:1182 =1782. Masc. *Perca lucioperca* of Bloch (= *Perca lucioperca* Linnaeus, 1758). Type by monotypy. Based on "Les Sandres" of Cuvier 1816:294 (see Gill 1903:966). Cuvier gave the species as *Perca Lucio perca*, but this is not a trinomen but the way some species were presented in early literature.

284. *Sander lucioperca* (Linnaeus, 1758)

Perca lucioperca Linnaeus [C.] 1758:289 [Systema Naturae, Ed. X v. 1].

EN: Pike perch.

Type locality: European lakes. No types known.

Distribution: Caspian Sea basin; introduced to lakes and reservoirs throughout Iran.

IUCN: Least Concern.

285. *Sander marinus* (Cuvier, 1828)

Lucioperca marina Cuvier [G.] in Cuvier & Valenciennes, 1828:120 [Histoire naturelle des poissons v. 2].

EN: Estuarine perch.

Type locality: Black Sea; Sea of Azov. No types known

Distribution: Caspian Sea basin.

IUCN: Data Deficient.

Order Scorpaeniformes (1 family, 2 genera and 2 species) (see Nelson et al. 2016).

Family Gasterosteidae (2 genera and 2 species)

Genus *Gasterosteus* Linnaeus, 1758 (1 species)

Gasterosteus Linnaeus [C.] 1758:295. Masc. *Gasterosteus aculeatus* Linnaeus, 1758. Type by subsequent designation. Type designated by Jordan & Gilbert 1883:393. On Official List (Opinion 77, Direction 56). Misspellings include *Gasterosterus* and *Gastrosteus*. Name spelled *Gasterostius* by Nau 1787:108, and *Garterosteus* by Griffith & Smith 1834:189 in synonymy.

Etmology: *Gasterosteus*: Greek, gaster = stomach + Greek, osteon = bone.

286. *Gasterosteus aculeatus* Linnaeus,

1758**

Gasterosteus aculeatus Linnaeus [C.] 1758:295 [Systema Naturae, Ed. X v. 1].

EN: Threespined stickleback.

Type locality: Europe. Syntypes: Zool. Soc. Lond. 29 (left half-skin), 30-31 (2, right half-skins).

Distribution: Introduced to the Caspian Sea, Kavir and Hari River basins.

IUCN: Least Concern.

Genus *Pungitius* Coste, 1848 (1 species)

Pungitius Coste [P.] 1848:588. Masc. *Gasterosteus pungitius* Linnaeus, 1758. Type

by subsequent designation or tautonymy. Appeared without named species; subsequent addition of species not researched; type above as given by Jordan 1923:174. Type may involve *P. laevis* (see footnote in Monod 1973:283). Fowler (MS) credits genus to d'Annone 1760:302 [Act. Helvet., v. 4; not investigated]. Etymology: *Pungitius*: Latin, pungitius = prickling.

287. *Pungitius platygaster* (Kessler, 1859)

Gasterosteus platygaster Kessler [K. F.] 1859:202 [Bulletin de la Société Impériale des Naturalistes de Moscou v. 32 (no. 3)].

EN: Ukrainian stickleback (Fig. 41).

Type locality: Odessa and side arm of Dnieper River in Aleschki, Ukraine. Syntypes: BMNH 1897.7.5.2 [ex ZIN] (2), ZIN 2350-51 (6, 6+).

Distribution: Caspian Sea basin.

IUCN: Least Concern.

Order Spariformes (1 family, 1 genus 1 species) (see Nelson et al. 2016).

Family Sparidae (1 genus and 1 species)

Genus *Acanthopagrus* Peters, 1855

Acanthopagrus (subgenus of *Chrysophrys*) Peters [W. (C.H.)] 1855:242. Masc. *Chrysophrys vagus* Peters, 1852. Type by monotypy. Appeared as "64, *Chrysophrys (Acanthopagrus) vagus* Pet." in the Arch. Naturgesch., v. 21:242.

Etmology: *Acanthopagrus*: Greek, akantha = thorn + Greek, pagros, a kind of fish.



Fig. 41. *Pungitius platygaster*, Anzali wetland, Caspian Sea (K. Abbasi).

288. *Acanthopagrus arabicus* Iwatsuki, 2013:

Acanthopagrus arabicus Iwatsuki [Y.] 2013:83, fig. 4 (b) [Journal of Fish Biology v. 83 (no. 1)].

EN: Arabian yellowfin seabream.

Type locality: Western Coast of Qatar (market specimen). Holotype: MUFS 33840.

Distribution: Tigris, Hormuz and Persis.

IUCN: Least Concern.

Comment: *Acanthopagrus latus* (Houttuyn, 1782) is a synonyme.

Recommendations

Similar to threats observed in other countries, habitat modification, pollution, introduction of exotic aquatic species, droughts, human population growth and illegal fishing are main threats to fish diversity in Iran (see Esmaeili et al. 2014c). Hence, it is suggested that biology, ecology maps of conservation hot spots be drawn up based on a combination of characters (e.g., fish diversity, population density, ecological requirements, threats), and risk level of incurring losses to local–global biodiversity (e.g., number of critically endangered species). Moreover, the potential distribution of many species, especially key and/or endangered species regarding the zoogeographical point of view and conservation management strategies, can be modelled in future according to Mostafavi et al. (2014).

Conclusions

In general, geological history, a long history of the connection and isolation from fresh and marine waters, multiple sources of species, uneven distribution of inflows and nutrient inputs, and low to moderate salinity, different habitat types (both fresh and brackish habitats, rivers, lakes, lagoons, marshes and marine environments) all have contributed to the high ichthyodiversity found in Iran.

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مرور و فهرست بروز شده ماهیان آب شیرین ایران: آرایه‌شناسی، پراکنش و وضعیت حفاظتی

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چکیده: هدف از این فهرست مرور و خلاصه سازی نتایج پژوهش‌های سیستماتیک و جغرافیای جانوری فون ماهیان آب های داخلی ایران طی ۲۰۰ سال گذشته است. از زمان مطالعات ژ.ژ. هکل (۱۸۴۶-۱۸۴۹)، تعداد گونه‌های معتبر به طور قابل توجهی افزایش یافته و وضعیت سیستماتیک بسیاری از آنها تغییر کرده است و مرتب‌سازی مجدد و روزآمد سازی اطلاعات منتشر شده ضروری شده است. در اینجا ما از فرصت استفاده کرده و فهرست جدید و به روز ماهیان آب شیرین ایران را بر اساس منابع و اطلاعات حضور آرایه‌ها برگرفته از کلکسیون‌های تاریخ طبیعی و نمونه‌برداری‌های جدید، آرایه می‌نماییم. این مقاله ۲۸۸ گونه در ۱۰۷ جنس، ۲۸ خانواده، ۲۲ راسته و سه رده را لیست می‌کند که از حوضه‌های مختلف ایران گزارش شده است. با این وجود، حضور ۲۳ گونه گزارش شده از ایران نیازمند تأیید با نمونه صید شده است. متنوع‌ترین راسته کپورماهی‌شکلان (۱۷۱ گونه، ۵۹/۴۰٪) و پس از آن گاوماهی‌شکلان (۴۲ گونه، ۱۴/۶۰٪)، کپوردندان‌ماهی‌شکلان (۱۷ گونه، ۵/۹۰٪) و شگ‌ماهی‌شکلان (۱۱ گونه، ۳/۸۲٪) است. هشتادوهشت گونه بومزاد (۳۰/۵۶٪) در ۷ خانواده و ۲۶ گونه غیربومی (۹/۰۳٪) در ۹ خانواده در اینجا فهرست شده است. در بین ۲۸۸ گونه گزارش شده از ایران، ۱۶۳ گونه ارزیابی نشده، ۹۳ گونه حداقل نگرانی، ۱۱ گونه آسیب‌پذیر، ۸ گونه بدون اطلاعات کافی، ۷ گونه به شدت در معرض خطر، ۳ گونه در معرض تهدید، ۱ گونه تهدید شده و ۱ گونه نیز طبق لیست قرمز IUCN، در طبیعت منقرض شده است. تنها دلیل عدم لیست شدن چنین تعداد عظیمی از گونه‌ها در لیست قرمز IUCN، فقدان اطلاعات در مورد این گونه‌ها در آب های داخلی در سطح ملی و جهانی است. این نمایانگر ضرورت بازنگری تقسیمات جهانی و کاربرد معیارهای لیست قرمز IUCN در سطح ملی براساس خط و مشی‌های IUCN است. با توجه به تعداد گونه‌های بومزاد در ایران، اولین قدم باید تهیه برآوردی از گونه‌های بومزاد بر اساس لیست قرمز IUCN باشد. در ده سال گذشته، تعدادی گونه بومی و غیربومی در آب‌های طبیعی جایجا شده یا معرفی شده‌اند. آبی‌پروری، صید ورزشی، کنترل مالاریا، اهداف زینتی، فعالیت‌های پژوهشی، نمایش در نمایشگاه‌های ملی و معرفی تصادفی و ناخواسته، علل اصلی این معرفی‌هاست. در اینجا، برای اولین بار، حضور تیرماهی سوسماری *Atractosteus spatula* را به عنوان یک ماهی شکارچی معرفی شده به دریاچه مریوان که به نظر می‌رسد از آکواریوم رهاسازی شده، گزارش می‌نماییم. در این فهرست، سایر گونه‌های مشکل‌دار نیز لیست شده، نام انگلیسی/عمومی هر گونه آرایه شده، واژه‌شناسی هر جنس، وضعیت حفاظتی هر گونه، و فهرست کتابنامه‌های اغلب منابع منتشر شده در مورد سیستماتیک ماهیان آب‌های داخلی ایران آورده شده است. اطلاعات آرایه شده برای توسعه مدیریت صحیح و عملی و سیاست‌های حفاظتی مؤثر، ضروری خواهد بود.

کلیدواژه‌ها: تنوع ماهیان، جغرافیای ماهیان، گونه‌های بومزاد، گونه‌های بیگانه، مناطق بوم‌شناختی.