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Research Article

An updated checklist of clupeiform fishes (Teleostei: Clupeiformes) in the North-Western Indian Ocean: Taxonomy, diversity, distribution, and conservation status

Hamid Reza Esmaeili*, Sorour Echreshavi

Ichthyology and Molecular Systematics Research Laboratory, Zoology Section, Department of Biology, School of Science, Shiraz University, Shiraz, Iran
*Correspondence: hresmaeili@shirazu.ac.ir; hresmaeili22@gmail.com

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Abstract

The present study lists species diversity of the order Clupeiformes in most parts of the Northwest Indian Ocean (NIO) and encompasses the marine waters of the Persian Gulf, Oman Sea, Arabian Sea, Red Sea, and the Gulf of Aden. The updated checklist enumerates 56 species, representing 21 genera and six families. At the family level, Dorosomatidae and Engraulidae have the greatest number of species (20 species; 35.7% in each), followed by Dussumieriidae (four species; 7.1%), and Chirocentridae and Spratelloididae (two species; 3.6% in each). Species diversity of the Persian Gulf and the Oman, Arabian, and Red seas are different due to substantial variations in the environmental features and oceanographic characteristics of the Persian Gulf (e.g., sea surface temperature ranges, salinity, depth, geographic position, and its geological history during the glaciation in Pleistocene. Based on the IUCN red list, most of the reported species (42 species, 75.4%) have been rated as "least concern" (LC), and the other species (13 species, 22.8%) have been rated as "data deficient" (DD), and one species (*Tenualosa toli*) as "vulnerable" (VU). Further research is underway, and it is expected that other species may be present in the northwestern Indian Ocean.

Keywords: Fish diversity, Clupeidae, Distribution, Red List, Persian Gulf, Arabian Sea, Iran, Oman Gulf

Introduction

Clupeiforms are globally distributed fish found in marine and freshwater water bodies and some are diadromous species (Bloom & Egan, 2018; Fricke et al., 2023). The clupeiform fishes (order Clupeiformes Goodrich, 1909) are small or medium-sized fish of coastal and dominant ecosystems that are abundant and are usually at the base of the food pyramid. They are prey for many predators such as fish-eating fish, mammals, squid, and seabirds. Many of which are also commercially important. Members of the order Clupeiformes are filter-feeding fishes that form large schools having a diverse group of trophic guilds and habitats (Bloom & Egan, 2018). Members of the order Clupeiformes are easy to access, economically of universal nutritional importance, have extremely high nutrient content, and in some human societies and countries, are the only source of protein. In total, they make up 20% to 30% of the world's annual

catch. Due to the ecological, cultural, nutritional, and economic importance of clupeiforms around the world, their conservation status requires more attention (Birge et al., 2021; Wang et al., 2022).

Till date, many attempts have been undertaken to resolve the phylogenetic intrarelationships of the clupeiforms (Figure 1), and several contradictory hypotheses have been proposed in the last decades (see Wang et al., 2022).

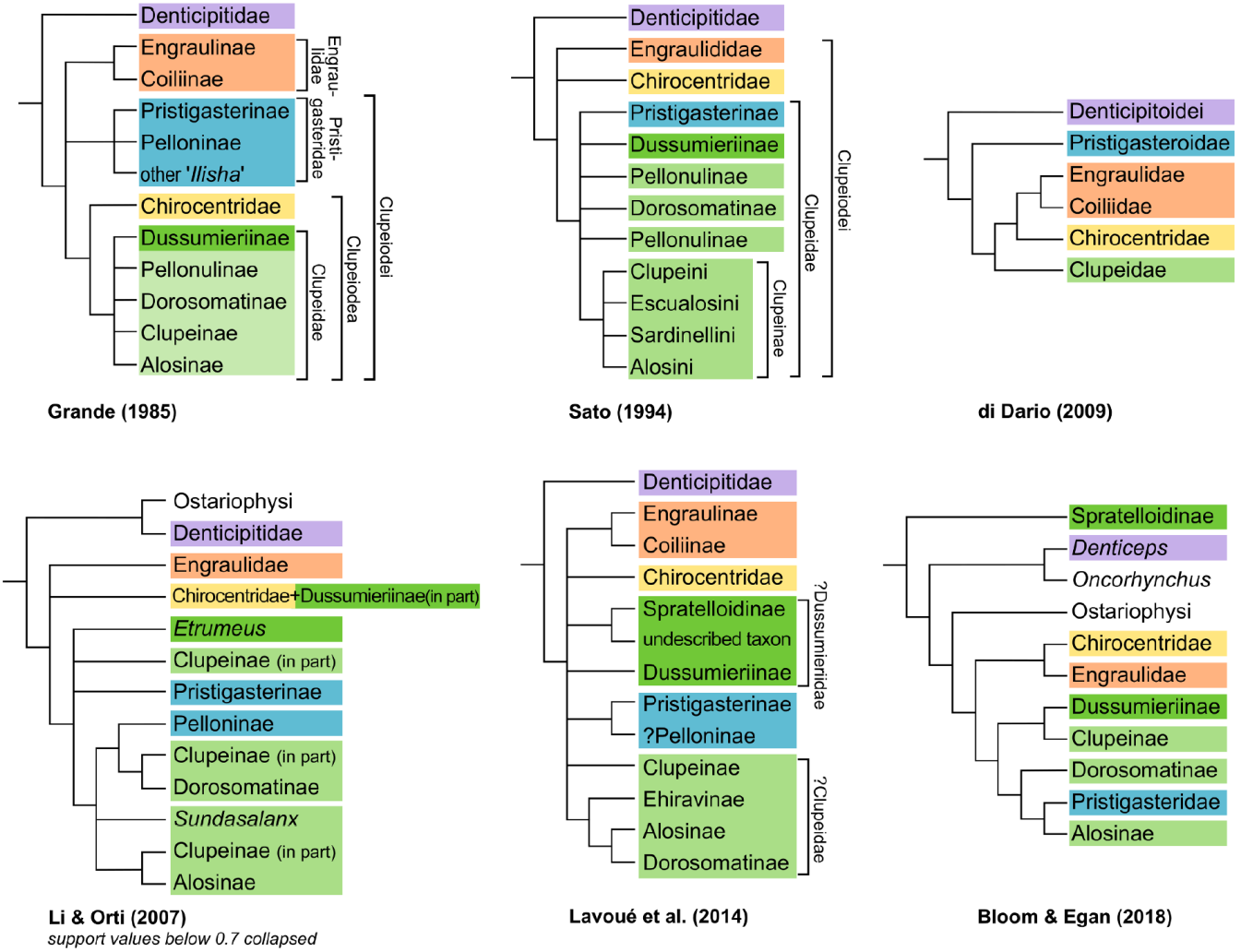

Figure 1. Selected morphological (upper row from Grande, 1985; Sato, 1994; di Dario 2009) and molecular (lower row from Li & Orti, 2007 based on 12 s, 16 s, rag1 and rag2 genes; Lavou´e et al., 2014 based on mitochondrial genomes; Bloom & Egan, 2018 based on *cytb*, 16 s, rag1 and rag2 genes) hypotheses on the phylogeny of Clupeiformes (see Wang et al., 2022).

Based on nuclear sequence data from 4,434 single-copy protein-coding loci using a gene-capture method, Wang et al. (2022) obtained a robust phylogeny based on 1,165 filtered loci with less than 30% missing data (Figure 2). Wang et al. (2022) reconfirm the monophyly of the Clupeiformes (Denticipitidae is considered as sister group to all other clupeiforms); confirm polyphyletic nature of dussumieriids, and the early branching of Spratelloididae from all other clupeoids. According to Wang et al. (2022), i) the Engraulidae and Pristigasteridae are both monophyletic groups, ii) within Pristigasteridae there is no support for monophyletic Pelloninae, iii) *Chirocentrus* is close to *Dussumieria* and not to engraulids, iv) the miniaturized *Sundasalanx* is placed close to the ehiravine *Clupeonella*, however, with a relatively deep split, v) the genus *Clupea*, is not part of the diverse "Clupeidae", but part of a clade containing additionally *Sprattus* and *Etrumeus*, and vi) Alosidae and Dorosomatidae are retrieved as sister clades.

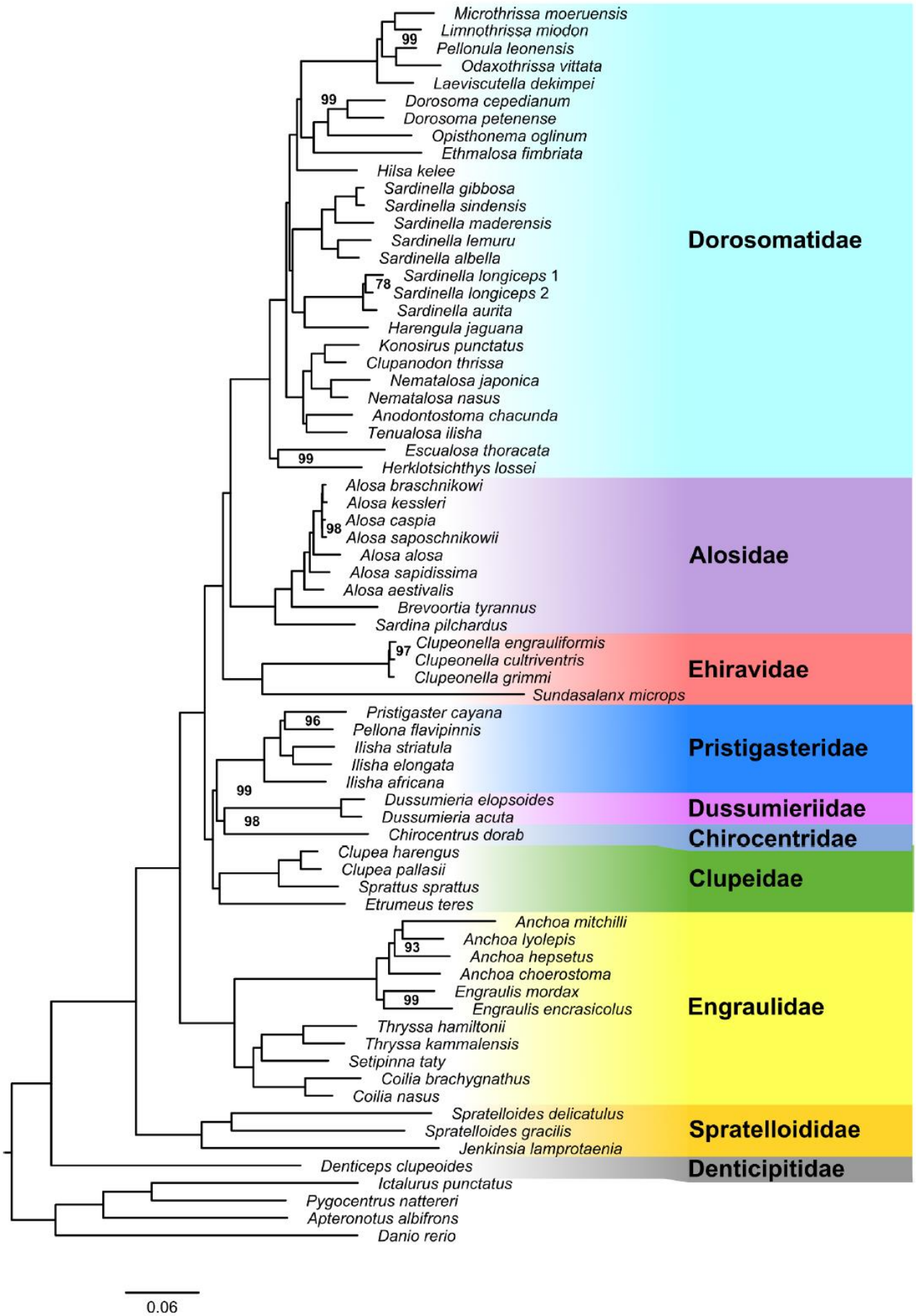

Figure 2. Maximum likelihood tree of the Clupeiformes based on 1,165 loci reconstructed using IQtree with best partition scheme from PartitionFinder2. Only bootstrap supports not equal to 100% are shown. Tree was rooted with *Lepisosteus oculatus* (not shown) (Wang et al., 2022).

Based on new fossil calibration points, Wang et al. (2022) found that major lineages of the clupeiforms diverged in the late Cretaceous and early Paleogene. The extinction event at the end of the Cretaceous may have created ecological niches, which could have fueled the diversification of clupeiform fishes. Based on new classifican proposed by Wang et al. (2022), the order Clupeiformes (Figure 2) globally includes two suborders (Denticipitoidei and Clupeoidei) and 10 families viz., Denticipitidae (one genus, one species), Spratelloididae (two genera, nine species), Engraulidae (Engraulinae + Coiliinae: 16 genera, 187 species), Clupeidae (seven genera, 14 species), Chirocentridae (one genus, two species), Dussumieriidae (two genera, 15 species), Pristigasteridae (nine genera, 39 species), Ehiravidae (11 genera, 29 species), Alosidae (four genera, 34 species), and Dorosomatidae (30 genera, 116 species). The highest diversity belongs to Engraulidae with two subfamilies Engraulinae (11 genera, 131 species), and Coiliinae (five genera, 56 species) (Fricke et al., 2023).

The International Union for Conservation of Nature (IUCN) Red List of Endangered Species provides a key starting point for highlighting and addressing species conservation needs. Red List (IUCN), Free Access Repository Specific species assessments categorize species conservation status by changing its extinction risk, which is the most accepted standard for species-level risk assessments that can be used to inform and be used to influence decisions related to biodiversity conservation (Birge et al., 2021).

The present checklist is designed to meet the rather urgent needs of those working on the order Clupeiformes. Many species are described and named annually, and several new records are being reported (Fricke et al., 2023). Most of this information is scattered in scientific journals. Collecting them in the form of checklists is a great help to researchers in the biological and environmental sciences. In this study, we compiled a list based on the online version of the Catalog of Fish and Fish Base until June 2023.

The current study covers Clupeiformes fishes of most parts of the Northwest Indian Ocean and encompasses the marine waters of the Persian Gulf, Oman Sea, Arabian Sea, Red Sea, and the Gulf of Aden (Figure 3). It provides an updated checklist of the order Clupeiformes including six families: Chirocentridae, Dorosomatidae, Dussumieriidae, Engraulidae, Spratelloididae, and Pristigasteridae in the Northwest Indian Ocean waters.

Figure 3. Map indicating marine boundaries for the of the studied area in the northwestern Indian Ocean.

Materials and Methods

Abbreviations of museum collections (see below) follow Fricke and Eschmeyer (2022a). This checklist is a collection of works listed in references (see selected Bibliography, e.g. Bath, 1977; Eagderi et al., 2019; Fischer & Bianchi, 1984; Golani & Bogorodsky, 2010; Golani & Fricke, 2018; Grande, 1985; Hadley Hansen, 1986; Lavoue et al., 2014; Nelson, 2016; Randall, 1995; Randall & DiBattista, 2012; Whitehead, 1985), and also, samples deposited in the Zoological Museum and Collection of Biology Department, Shiraz (ZM-CBSU). Genera and species are arranged alphabetically; the nomenclature and authorities used for Clupeiformes follow those of the online electronic version of the Catalog of Fishes (Fricke et al., 2023). For classification of Clupeiformes, Wang et al. (2022), and Fricke et al. (2023) were followed. English/common names are provided. The IUCN Red List of threatened species was followed to show the conservation status of each species (IUCN, 2023).

Results

Systematics

In total, 56 species belonging to 21 genera and six families viz., Dorosomatidae (nine genera and 20 species), Engraulidae (five genera and 20 species), Pristigasteridae (three genera and eight species), Dussumieriidae (two genera and four species), and Chirocentridae and Spratelloididae (one genus and two species in each) found in the Persian Gulf, the Sea of Oman, the Arabian Sea and the Red Sea.

The general morphological characteristics of the families are presented here:

The family Chirocentridae (Wolf-herrings) are characterized by the following morphological characteristics: very elongate, highly compressed fishes resembling the Clupeidae, but without scutes along the belly. Large canine teeth in both jaws. No spiny rays in fins; a single dorsal fin set well behind the midpoint of the body; pectoral fins set low on the body; pelvic fins about equidistant between pectoral base and anal origin; anal fin origin below anterior dorsal fin base; caudal fin deeply forked. 17–22 gill rakers; no pyloric caeca; scales small; dorsal fin with 16–19 rays; anal fin with 30–35 rays; pelvic fins small, with six or seven rays; pectoral fin with 13–15 rays; eight branchiostegals; pelvic scute highly reduced in adults; vertebrae 69–75 (42–45 abdominal and 27–31 caudal). Wolf herrings are voracious carnivores, unlike other clupeoids. Maximum length 100 cm. The only fossil recognized in the Chirocentridae is the Late Cretaceous †Gastroclupea from Bolivia. Marine; Indian (west to South Africa and the Red Sea) and western Pacific (Japan to Queensland, Australia) (Nelson et al., 2016; Psomadakis et al., 2015) (Figure 4). The family Chirocentridae includes the genus *Chirocentrus* with two species (3.6%) (Figure 5).

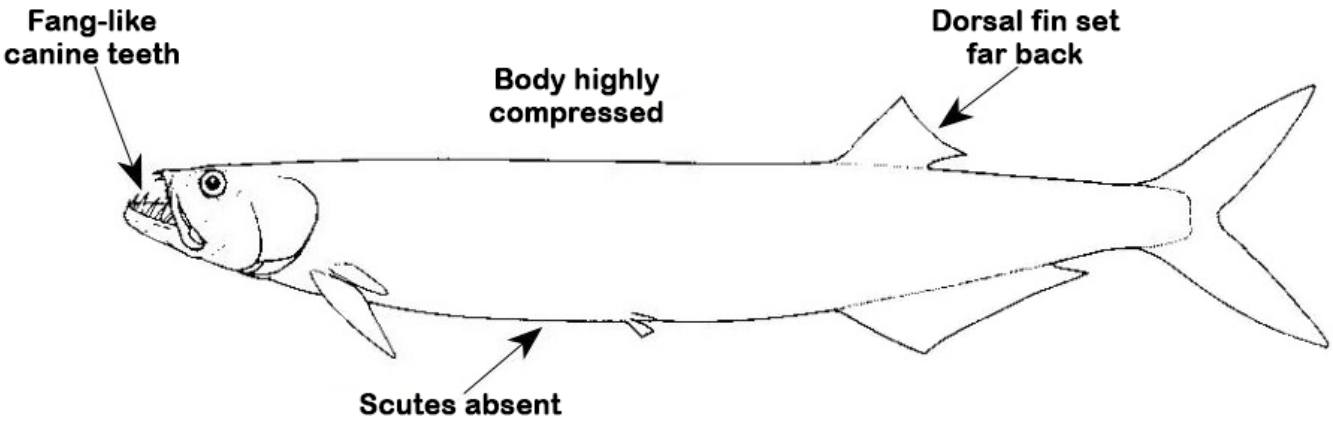

Figure 4. General morphology of a Wolf herring, Psomadakis et al. (2015).

The family Dorosomatidae (Gizzard shads) is characterized by: moderate-sized (<30 cm SL) with w-shaped pelvic scutes. Mouth inferior or subterminal in Western Indian Ocean species; tip of lower jaw fits into notch in upper jaw; no teeth. Last dorsal-fin ray filamentous except in two genera. Stomach wall thick, and gizzard-like. Occur in all three major oceans, but some are entirely freshwater. It comprises 10 genera and 20 species in the studied region.

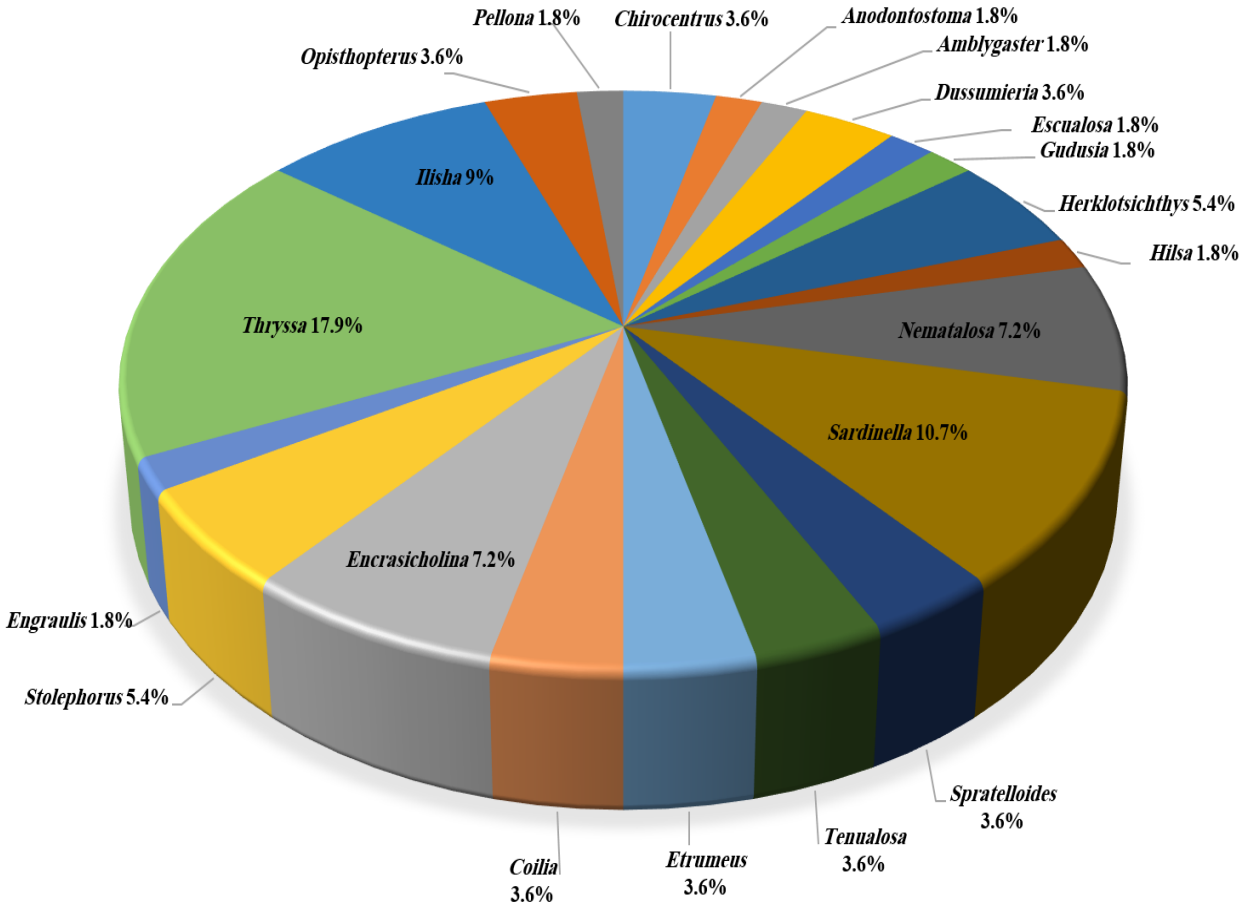

Figure 5. The genera diversity of Chirocentridae, Dorosomatidae, Dussumieriidae, Engraulidae, Pristigasteridae and Spratelloididae in the North-Western Indian Ocean.

The family Dussumieriidae (round herrings–rainbow sardines) is characterized by: absence of dorsal and anal spines, dorsal soft rays 16-18; anal soft rays 14-18; pelvic fins advanced; and W-shaped pelvic scute. Branchiostegal rays 13 to 17. No striae on the posterior part of scales. Isthmus with tapering evenly forward. To 23 cm. Marine, pelagic, and schooling fishes. Of interest to fisheries (Lavoué et al., 2017; Nelson et al., 2016). The family Dussumieriidae includes two genera and four species (7.1%) (Figure 5).

Engraulidae (Anchovies) is another family of clupeiforms characterized by: small, mostly silvery fishes, usually between 7 to 15 cm length, generally with fusiform, subcylindrical bodies (Figure 6) but sometimes quite strongly compressed (body tapering to a point in the grenadier anchovies *Coilia*). Scutes usually present along belly (except in *Engraulis*). Snout usually pig-like and projecting, lower jaw characteristically "underslung"; the hind of tip of the upper jaw (maxilla) extending far backward, sometimes projecting beyond the gill cover; jaw teeth small; pseudobranch present gill-like structure on inner face of opercle). No spiny rays in fins; pectoral fins set low on body; pelvic fins usually about half-way between pectoral fin bases and anal fin origin; anal fin short or long; caudal fin normally forked, but small and rounded in the grenadier anchovies (*Coilia*). Scales cycloid (smooth to touch); no lateral line. Body in back blue/green or translucent grey, and sides silver or with a silver band. Most anchovies are marine, but some can tolerate low salinities or even freshwater. Although usually small, many are shoaling species of great importance to fisheries; some are used for food, others for bait (Nelson et al., 2016; Psomadakis et al., 2015). In the family Engraulidae of the studied region, the genus *Thryssa* presents 10 species (17.9%), *Encrasicholina* four species (7.1%), *Stolephorus* three species (5.4%), *Coilia* two species (3.6%), and *Engraulis* one species (1.8%) (Figure 5).

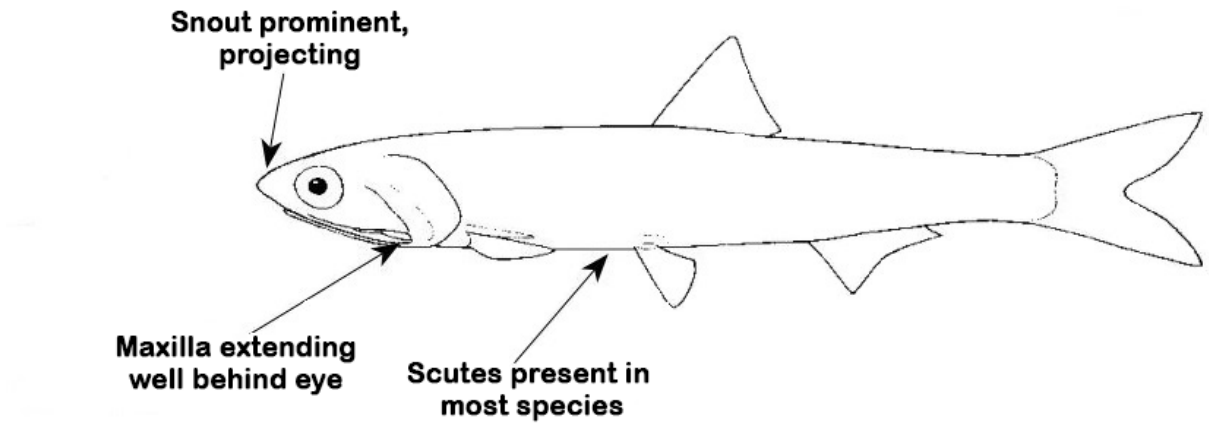

Figure 6. General morphology of an Anchovies, Psomadakis et al. (2015).

The family Pristigasteridae (longfin herrings) is a group of primarily marine (some freshwater) that are distributed in South America and Southeast Asia; Atlantic, Indian, and Pacific in tropical and some subtropical seas. Mouth usually superior, otherwise terminal; jaw teeth small, canines only in *Chirocentrodon*; abdominal scutes present; anal fin long with 30–92 rays; six branchiostegal rays; scales in lateral series about 35–55; vertebrae usually 40–55, up to 62 in *Raconda*. Pelvic fins absent in several species. Grande (1985) recognized this taxon on the basis of having the predorsal bones orientated either vertically or inclined anterodorsally (versus being inclined posterodorsally as in nearly all other teleosts) and no notch in the third hypural of the caudal skeleton (versus having a distinct notch that creates a gap with the second hypural as in most clupeomorphs). He recognized this group as a superfamily, giving family status to the following subfamilies, and noted that *Ilisha*, as recognized here, is not monophyletic. Maximum length about 55 cm SL, attained in *Pellona flavipinnis* of South America; most under 25 cm (Nelson et al., 2016; Psomadakis et al., 2015) (Figure 7). In the family Pristigasteridae, the genus *Ilisha* presents five species (9%), *Opisthopterus* with two species (3.6%), and *Pellona* with one species (1.8%) (Figure 5).

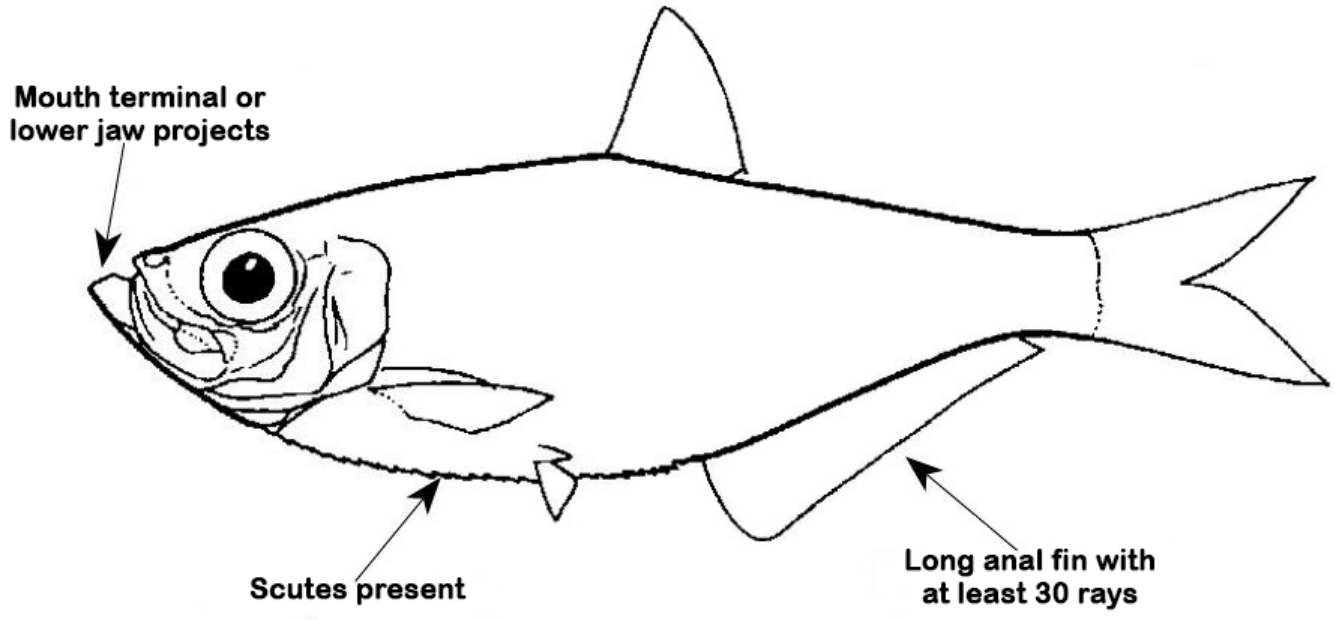

Figure 7. General morphology of a longfin herring, Psomadakis et al. (2015).

The family Spratelloididae (Round herring) is a group of coastal marine fishes found in tropical and temperate waters of the Indo-West Pacific, and are important as food and bait. They are characterized by: Body elongated, slightly compressed, rounded ventrally. Snout pointed, and jaws equal or lower very slightly projecting. Two supra-maxillae, well-developed posterior fontanelles usually narrowly

anteriorly. Premaxilla edentulous. Cleithral flap well developed. Posterior border of sub operculum evenly rounded. W-shaped pelvic scute; pelvic fins below the middle of the dorsal fin (Nelson et al., 2016; Psomadakis et al., 2015) (Figure 8). In the Spratelloididae family, the genus *Spratelloides* presents two species (3.6%) (Figure 5).

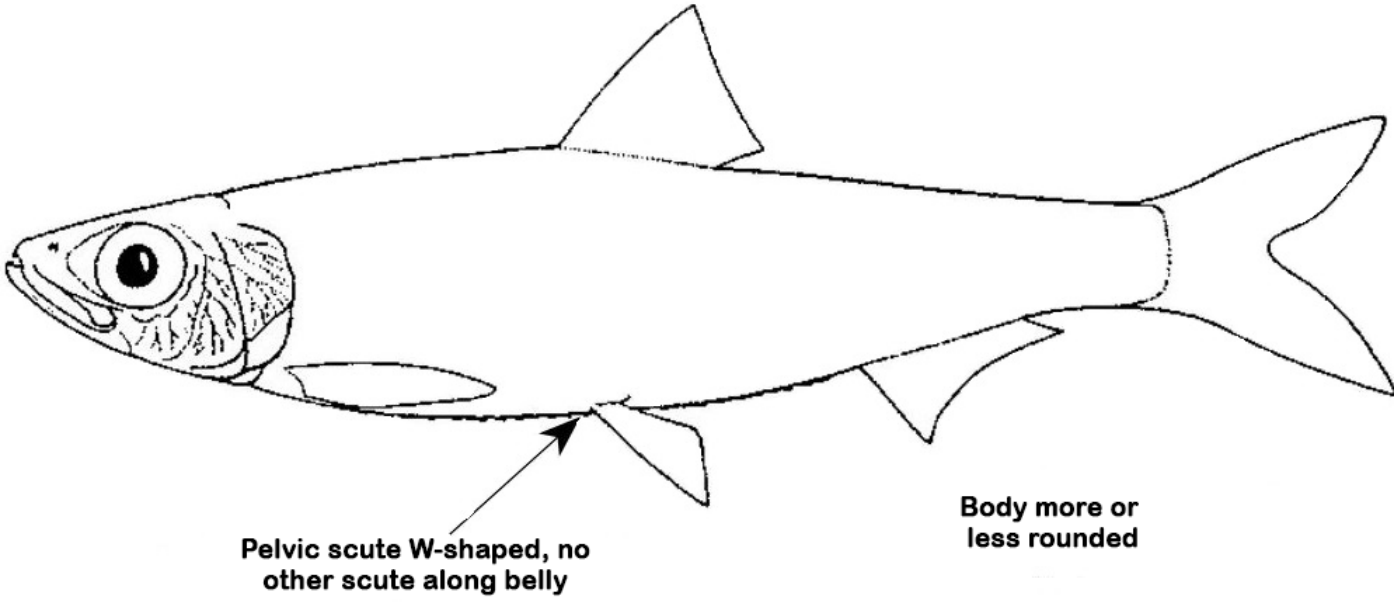

Figure 8. General morphology of a Round herrings, Psomadakis et al. (2015).

Based on the IUCN red list, most of the reported species (42 species, 75.4%) have been rated as least concern (LC), 13 species (22.8%) have been rated as "data deficient" (DD), one species (*Tenualosa toli*) is listed in the vulnerable (VU) category (Figure 9).

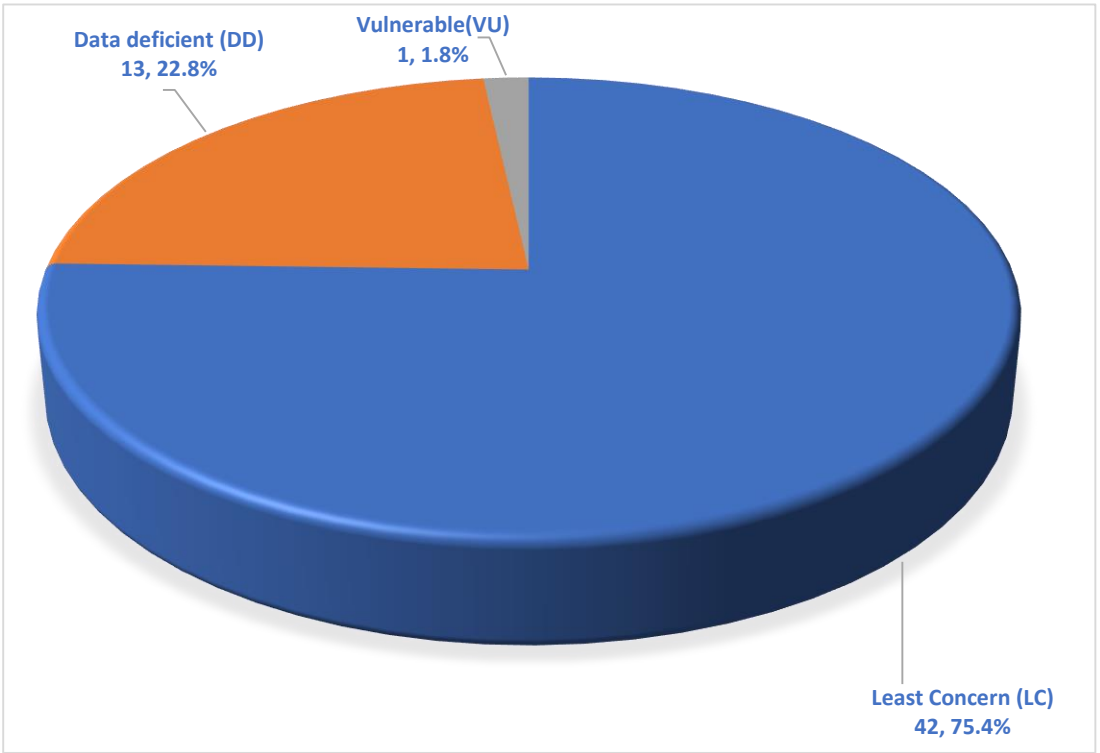

Figure 9. Number and percentage of clupeiform species in different IUCN categories in the North-Western Indian Ocean.

Information about distribution, habitat, IUCN categories, etc. for each species are given below, taking into account the systematic ranking.

Class: Actinopterygii
Order: Clupeiformes (six families, 21 genera, and 56 species)
Family: Chirocentridae (one genus, and two species)
***Chirocentrus* Cuvier, 1816**
Chirocentrus Cuvier 1816: 178 [Le Règne Animal v. 2] Masc. *Clupea dorab* Forsskål, 1775. Type by monotypy.

1) *Chirocentrus dorab* (Forsskål, 1775) - Dorab wolf-herring
Original description: *Clupea dorab* Fabricius 1775: 72, xiii [Descriptiones animalium (Forsskål)].
Synonyms: *Clupea dentex* Bloch & Schneider, 1801; *Esox chirocentrus* Lacepède, 1803; *Chirocentrus hypselosoma* Bleeker, 1852; *Neosudis vorax* Castelnau, 1873.
Type: Jeddah, Saudi Arabia, Red Sea; [Mochhae] Al-Mukhā, Yemen, Red Sea. No types known. Neotype designation by Fricke (1999: 81).
Distribution: Red Sea; Indo-West Pacific: East Africa, KwaZulu-Natal (South Africa), Socotra, Seychelles, Madagascar, eastern Mascarenes and Persian Gulf east to Indonesia, Fiji and Tonga, north to southern Japan, south to Western Australia at 22°15'S, New South Wales (Australia) and New Caledonia.
Environment: Reef-associated.
Depth range: 0-120 m.
IUCN: Least Concern (LC).

2) *Chirocentrus nudus* (Swainson, 1839) - Whitefin wolf-herring
Original description: *Chirocentrus nudus* Swainson 1839: 294 [The natural history and classification v. 2].
Synonyms: *Esox nudus* Herman, 1804; *Chirocentrus russellii* Swainson, 1838.
Type: No locality [Visakhapatnam, India, eastern Indian Ocean]. No types known.
Distribution: Red Sea; Indo-West Pacific: East Africa, Durban (South Africa), Madagascar, Seychelles, and Persian Gulf east to the Philippines and New Guinea, north to southern Japan, south to Western Australia and Queensland (Australia).
Environment: Pelagic-neritic**.**
Depth range: 0-150 m.
IUCN: Least Concern (LC).

Family: Dorosomatidae (nine genera and 20 species)
***Anodontostoma* Bleeker, 1849**
Anodontostoma Bleeker 1849: 15 [Verhandelingen van het Bataviaasch Genootschap van Kunsten en Wetenschappen. v. 22 [8]; Neut. *Anodontostoma hasseltii* Bleeker 1849. Type by monotypy.

3) *Anodontostoma chacunda* (Hamilton, 1822) - Chacunda gizzard shad
Original description: *Clupanodon chacunda* Hamilton 1822: 246, 283 [An account of the fishes found in the river Ganges.].
Synonyms: *Clupanodon chacunda* Hamilton, 1822; *Chatoessus tampo* Valenciennes, 1848; *Anodontostoma hasseltii* Bleeker, 1849; *Gonostoma javanicum* Hyrtl, 1855; *Chatoessus altior* Günther, 1868.
Type: Ganges River estuary, India. No types known.
Distribution: Indo-West Pacific: Persian Gulf to coasts of India and Andaman Sea, to Gulf of Thailand, Indonesia, Viet Nam, and the Philippines, south to northern Australia, the Caroline Islands, and New Caledonia.
Environment: Pelagic-neritic.
Depth range: 0-50 m.
IUCN: Least Concern (LC).

4) *Amblygaster sirm* (Walbaum, 1792) - Spotted sardinella

Original description: *Amblygaster sirm* var. Walbaum 1792: 38 [Petri Artedi sueci genera piscium Part 3.].

Synonyms: *Clupea sirm* Walbaum, 1792; *Sardinella leiogastroides* Bleeker, 1854; *Clupea pinguis* Günther, 1872; *Sardinops dakini* Whitley, 1937; *Sardinella jonesi* Lazarus, 1983.

Type: [No locality stated] Red Sea. No types known. Type catalog: Fricke (2008: 17).

Distribution: Indo-West Pacific: Red Sea and Mozambique to the Philippines, north to Taiwan and Okinawa (Japan), south to New Guinea, the Arafura Sea, northern Australia, and Fiji.

Environment: Reef-associated.

Depth range: 10-75 m.

IUCN: Least Concern (LC).

***Escualosa* Whitley, 1940**

Escualosa Whitley 1940: 402 [Australian Zoologist v. 9 (pt 4)] Fem. *Clupea macrolepis* Steindachner, 1879. Type by original designation (also monotypic).

5) *Escualosa thoracata* (Valenciennes, 1847) - White sardine

Original description: *Kowala thoracata* Valenciennes, 1847: 363 [Histoire naturelle des poissons v. 20].

Synonyms: *Clupea coval* Cuvier, 1829; *Clupea kowal* Rüppell, 1837; *Kowala thoracata* Valenciennes, 1847; *Meletta lile* Valenciennes, 1847; *Rogenia argyrotaenia* Bleeker, 1852; *Clupea macrolepis* Steindachner, 1879; *Clupea huae* Tirant, 1883.

Type: Puducherry, India. Lectotype: MNHN 0000-3172. Paralectotypes: MNHN B-3075 [ex MNHN 0000-3172] (2). Type catalog: Bertin (1940: 282), Whitehead and Bauchot (1986: 16). Lectotype selected by Whitehead (1967: 71).

Distribution: Indo-West Pacific: northern Indian Ocean (Karachi eastward to Rangoon) to Thailand, Indonesia (Java Sea), the Philippines, Papua New Guinea, and Australia.

Environment: Pelagic-neritic.

Depth range: 0-50 m.

IUCN: Least Concern (LC).

***Gudusia* Fowler, 1911**

Gudusia (subgenus of *Sardinella*) Fowler 1911: 207 [Proceedings of the Academy of Natural Sciences of Philadelphia v. 63] Fem. *Clupanodon chapra* Hamilton, 1822. Type by original designation (also monotypic). Misspelled *Gadusia* by authors.

6) *Gudusia chapra* (Hamilton, 1822) - Indian river shad

Original description: *Clupanodon chapra* Hamilton 1822: 248, 383 [An account of the fishes found in the river Ganges].

Synonyms: *Clupanodon cagius* Hamilton, 1822; *Clupea champil* Gray, 1834; *Clupea indica* Gray, 1834; *Alausa microlepis* Valenciennes, 1847; *Clupea suhia* Chaudhuri, 1912; *Gudusia godanahiai* Srivastava, 1968.

Type: Upper parts of Ganges River, Gandak River in Saran, Bihar, India. Holotype: ZSI F4648/1. Type catalog: Menon and Yazdani (1968: 99). Hamilton's original, unpublished illustration reproduced by Britz (2019: Pl. 139).

Distribution: Asia: rivers of India and Bangladesh affluent to the Bay of Bengal (chiefly the Ganges and Brahmaputra systems and the Mahanadi River of Orissa). Reported from Nepal and Pakistan.

Environment: Pelagic.

Depth range: -

IUCN: Least Concern (LC).

***Herklotsichthys* Whitley, 1951**

Herklotsichthys Whitley 1951: 67 [Proceedings of the Royal Zoological Society of New South Wales v. for 1949-50] Masc. *Harengula dispilonotus* Bleeker 1852. Type by being a replacement name. Replacement for *Herklotsella* Fowler, 1934 (Jan.), preoccupied by *Herklotsella* Herre, 1933 in fishes.

7) *Herklotsichthys lossei* (Wongratana, 1983) - Gulf herring

Original description: *Herklotsichthys lossei* Wongratana 1983: 392, fig. 7 [Japanese Journal of Ichthyology v. 29 (no. 4)].

Synonyms: -

Type: Persian Gulf, 30°08'N, 46°54'E. Holotype: BMNH 1976.8.19.78. Paratypes: BMNH 1976.8.19.51-63 (13), 1976.8.19.64-77 (21); ZMUC C.1 (1), C.2-4 (3).

Distribution: Western Indian Ocean: Persian Gulf, possibly also the Red Sea.

Environment: Pelagic-neritic.

Depth range: 0-50 m.

IUCN: Least Concern (LC).

8) *Herklotsichthys quadrimaculatus* (Rüppell, 1837) - Bluestripe herring

Original description: *Clupea quadrimaculata* Rüppell 1837: 78, Pl. 21 (fig. 3) [Neue Wirbelthiere zu der Fauna von *Abyssinien gehörig*. Fische des Rothen Meeres].

Synonyms: *Clupea mauritiana* Bennett, 1833; *Clupeonia fasciata* Valenciennes, 1847; *Harengula bipunctata* Valenciennes, 1847; *Meletta obtusirostris* Valenciennes, 1847; *Meletta venenose* Valenciennes, 1847; *Sardinella lineolate* Valenciennes, 1847; *Alausa schrammii* Bleeker, 1849; *Harengula moluccensis* Bleeker, 1853; *Harengula kunzei* Bleeker, 1856; *Clupea dubia* Bleeker, 1872; *Harengula stereolepis* Ogilby, 1898; *Clupea rechingeri* Steindachner, 1906; *Clupea mizun* Kishinouye, 1908; *Harengula lippa* Whitley, 1931.

Type: Bay of Massawa, Eritrea, Red Sea. Lectotype: SMF 4648. Paralectotypes: SMF 78 (1), 4649-52 (4). Lectotype selected by Dor (1984: 41).

Distribution: Indo-Pacific: widespread in the Indian Ocean and western Pacific, including the entire eastern coast of Africa, Madagascar, Mauritius eastward to Japan, eastern Australia, and Samoa. Introduced into Hawaii, apparently by accident, and now abundant. At least one country reports adverse ecological impact after introduction.

Environment: Reef-associated.

Depth range: 0-13 m.

IUCN: Least Concern (LC).

9) *Herklotsichthys punctatus* (Rüppell, 1837) - Spotback herring

Original description: *Clupea punctata* Rüppell 1837: 78, Pl. 21 (fig. 2) [Neue Wirbelthiere zu der Fauna von Abyssinien gehörig. Fische des Rothen Meeres].

Synonyms: *Harengula arabica* Valenciennes, 1847; *Harengula bipunctata* Valenciennes, 1847.

Type: Red Sea. Lectotype: SMF 567. Paralectotypes: SMF 4649 (1), 6650 (1). Lectotype established by Dor (1984: 40) if not designated earlier.

Distribution: Western Indian Ocean: Red Sea and possibly Gulf of Aden; an immigrant into eastern Mediterranean Sea. The names *Herklotsichthys punctata* and *Herklotsichthys punctatus* have been widely misused in the literature for another species, *Herklotsichthys quadrimaculatus*.

Environment: Pelagic-neritic.

Depth range: 0-50 m.

IUCN: Least Concern (LC).

***Hilsa* Regan, 1917**

Hilsa Regan 1917: 303 [Annals and Magazine of Natural History (Series 8) v. 19 (no. 112)] Fem. *Clupea durbanensis* Regan 1906. Type by being a replacement name. Replacement for *Paralosa* Regan 1916, preoccupied by *Paralosa* Bleeker 1868 in fishes. Treated by some authors as a junior synonym of *Macrura* van Hasselt [see account of *Macrura* van Hasselt].

10) *Hilsa kelee* (Cuvier, 1829) - Kelee shad

Original description: *Clupea kelee* Cuvier 1829: 320 [Le Règne Animal (Edition 2) v. 2].

Synonyms: *Clupeonia blochii* Valenciennes, 1847; *Alosa brevis* Bleeker, 1848; *Alausa kanagurta* Bleeker, 1852; *Alausa brachysoma* Bleeker, 1854; *Alosa malayana* Bleeker, 1866; *Clupea platygaster* Günther, 1868; *Clupea durbanensis* Regan, 1906.

Type: Vizagapatam, India. No types known. Type catalog: Whitehead and Bauchot (1986: 39).

Distribution: Indo-West Pacific: probably all coasts of Indian Ocean, from Gulf of Oman and Gulf of Aden south to Durban and Madagascar, across the Bay of Bengal, Gulf of Thailand, Java Sea and north to Hong Kong and east to Papua New Guinea and possibly further.

Environment: Pelagic-neritic.

Depth range: 10 m.

IUCN: Least Concern (LC).

***Nematalosa* Regan, 1917**

Nematalosa Regan 1917: 312 [Annals and Magazine of Natural History (Series 8) v. 19 (no. 112)] Fem. *Clupea nasus* Bloch, 1795. Type by subsequent designation. Type designated by Jordan (1920: 560). *Nematolosa* is a misspelling.

11) *Nematalosa arabica* (Regan, 1917) - Arabian gizzard shad

Original description: *Nematalosa arabica* Regan 1917: 313 [Annals and Magazine of Natural History (Series 8) v. 19 (no. 112)].

Synonyms: -

Type: Muscat, Oman, Gulf of Oman, Arabian Sea, northwestern Indian Ocean. Holotype (unique): BMNH 1887.11.11.312.

Distribution: Northwestern Indian Ocean: Gulf of Aden, Socotra, Gulf of Oman and Persian Gulf.

Environment: Pelagic-neritic.

Depth range: -

IUCN: Data deficient (DD).

12) *Nematalosa nasus* (Bloch, 1795)

Original description: *Clupea nasus* Bloch 1795: 116, Pl. 429 (fig. 1) [Naturgeschichte der ausländischen Fische v. 9].

Synonyms: *Clupanodon nasica* Lacepède, 1803; *Chatoessus altus* Gray, 1834; *Chatoessus chrysopterus* Richardson, 1846.

Type: Malabar, India. Holotype (unique): ZMB 3898. Type catalog: Paepke (1999: 65) with locality as Indian Ocean. On p. 117 of Bloch's Ichthyologie, v. 12.

Distribution: Indo-West Pacific: Gulf of Aden north to the Persian Gulf, then eastward to the Andaman Sea, South China Sea and the Philippines, and north to southern tip of Korea. Also reported from Durban Bay in South Africa based on a single juvenile.

Environment: Pelagic-neritic.

Depth range: 0-30 m.

IUCN: Least Concern (LC).

13) *Nematalosa persara* Nelson & McCarthy, 1995 - Persara gizzard shad

Original description: *Nematalosa persara* Nelson & McCarthy 1995: 380, fig. 1 [Japanese Journal of Ichthyology v. 41 (no. 4)].

Synonyms: -

Type: Road Bay, Saudi Arabia. Holotype: AMNH 56108. Paratypes: AMNH 56109 (16). Non-types: AMNH, BMNH, BPBM.

Distribution: Northwestern Indian Ocean: Persian Gulf east to Pakistan.

Environment: Pelagic-neritic.

Depth range: -

IUCN: Data deficient (DD).

14) *Nematalosa resticularia* Nelson & McCarthy, 1995 - Gulf gizzard shad

Original description: *Nematalosa resticularia* Nelson & McCarthy 1995: 379, fig. 1 [Japanese Journal of Ichthyology v. 41 (no. 4)].

Synonyms: -

Type: Tarut Island, Saudi Arabia. Holotype: AMNH 56100. Paratypes: AMNH 56101 (19). Additional material: AMNH, BPBM, and ZMUC.

Distribution: Northwestern Indian Ocean: Somalia and Gulf of Aden to Persian Gulf.

Environment: Pelagic-neritic.

Depth range: -

IUCN: Data deficient (DD).

***Sardinella* Valenciennes, 1847**

Sardinella Valenciennes, 1847: 261 [Histoire naturelle des poissons v. 20] Fem. *Sardinella aurita* Valenciennes, 1847. Type by subsequent designation. Type designation by Gill (1861: 35) (see Whitehead, 1967: 36 or by designation by Valenciennes p. 262).

15) *Sardinella albella* (Valenciennes, 1847) - White sardinella

Original description: *Kowala albella* Valenciennes, 1847: 362, Pl. 602 [Histoire naturelle des poissons v. 20].

Synonyms: *Clupalosa bulan* Bleeker, 1849; *Clupeonia perforata* Cantor, 1849; *Kowala lauta* Cantor, 1849; *Spratella kowala* Bleeker, 1851; *Clupea sundaica* Bleeker, 1870; *Harengula dollfusi* Chabanaud, 1933.

Type: Puducherry, India. Lectotype: MNHN 0000-0665. Paralectotypes: MNHN 0000-3231 (1). Type catalog: Bertin (1940: 287), Whitehead & Bauchot (1986: 16). Lectotype selected by Whitehead (1967: 53).

Distribution: Indo-West Pacific: Red Sea, Persian Gulf, East African coasts, Madagascar eastward to Indonesia and the Arafura Sea, north to Taiwan and south to Papua New Guinea.

Environment: Reef-associated.

Depth range: 0-50m.

IUCN: Least Concern (LC).

16) *Sardinella gibbosa* (Bleeker, 1849) - Goldstripe sardinella

Original description: *Clupea gibbosa* Bleeker 1849: 72 [Journal of the Indian Archipelago and Eastern Asia (Singapore) v. 3 (no. 1)].

Synonyms: *Clupanodon jussieu* Lacepède, 1803; *Spratella tembang* Bleeker, 1851; *Clupea immaculata* Kishinouye, 1908; *Harengula dollfusi* Chabanaud, 1933; *Fimbriclupea dactylolepis* Whitley, 1940; *Sardinella taiwanensis* Raja & Hiyama, 1969.

Type: Makassar, Sulawesi, Indonesia. Neotype: BMNH 1867.11.28.46. Possible syntypes: AMS I.86 (1), RMNH 7100 (some of 26). Bleeker specimens: MNHN 0000-2040 (1), NMV 46041-41 (2). Type catalog: Bertin (1940: 287). Neotype (as putative neotype) selected by Whitehead et al. (1966: 57).

Distribution: Indo-West Pacific: widespread in the Indo-West Pacific including the Red Sea, and reported as an invasive species in the eastern Mediterranean basin.

Environment: Reef-associated.

Depth range: 10-70 m.

IUCN: Least Concern (LC).

17) *Sardinella longiceps* (Valenciennes, 1847) - Indian oil sardine

Original description: *Sardinella longiceps* Valenciennes, 1847: 273 [Histoire naturelle des poissons v. 20].

Synonyms: *Alausa scombrina* Valenciennes, 1847; *Sardinella neohowii* Valenciennes, 1847; *Sardinella neglecta* Wongratana, 1983.

Type: Puducherry, India. Lectotype: MNHN 0000-3743. Paralectotypes: MNHN B-3089 [ex MNHN 0000-3743] (5). Type catalog: Bertin, 1940:285, Whitehead & Bauchot (1986: 27-28). Lectotype selected by Whitehead (1967: 44).

Distribution: Red Sea, western Indian Ocean: East Africa, Somalia, Gulf of Aden, Socotra, and Persian Gulf east to India.
Environment: Pelagic-neritic.
Depth range: 20-200 m.
IUCN: Least Concern (LC).

18) *Sardinella melanura* (Cuvier, 1829) - Blacktip sardinella
Original description: *Clupea melanura* Cuvier 1829: 318 [Le Règne Animal (Edition 2) v. 2]
Synonyms: *Clupeonia commersoni* Valenciennes, 1847; *Clupeonia vittate* Valenciennes, 1847; *Harengula melanurus* Bleeker, 1854; *Clupea atricauda* Günther, 1868; *Harengula valenciennesi* Bleeker, 1868; *Harengula vanicoris* Jordan & Seale, 1906; *Sardinella nigricaudata* Chan, 1965.
Type: Vanikoro Island, Santa Cruz Islands, southwestern Pacific. Neotype: MNHN 0000-3233. Non-types: MNHN B-3090 [ex MNHN 0000-3233] (2). Type catalog: Whitehead and Bauchot (1986: 11). Available from footnote as, "*Cl. melanura*, N., Lacéd., V, xi, 3, sous le nom de *Clupanodon Jussieu*, mais la description se rapporte à la fig. xi, 3, nommée variété du *clupanodon chinois*." Neotype designated by Whitehead (1967: 62).
Distribution: Indo-West Pacific: East Africa, Persian Gulf, Seychelles, Madagascar and western Mascarenes east to northern Gilbert Islands (Kiribati), Samoa and Tonga, north to southern Japan, south to Dampier Archipelago (Western Australia), Queensland (Australia) south to 23°03'S and New Caledonia.
Environment: Pelagic-neritic.
Depth range: 0-50 m.
IUCN: Least Concern (LC).

19) *Sardinella sindensis* (Day, 1878) - Sind sardinella
Original description: *Clupea sindensis* Day 1878: 638, Pl. 163 (fig. 2) [The fishes of India Part 4].
Synonyms: -
Type: Karachi, Pakistan. Lectotype: ZSI 2630. Possible types and/or Day specimen: AMS B.7642 (1, paralectotype) Mumbai; BMNH 1889.2.1.1919-24 (6); RMNH 2519 (1); ZSI 2614 (1). Type catalog: Whitehead & Talwar (1976: 154), Ferraris et al. (2000: 302). Lectotype selected by Talwar and Whitehead (1971).
Distribution: Northwestern Indian Ocean: Gulf of Aden, Persian Gulf and Gulf of Oman east to western India.
Environment: Pelagic-neritic.
Depth range: 0-200 m.
IUCN: Least Concern (LC).

20) *Sardinella fimbriata* (Valenciennes, 1847) - Fringescale sardinella
Original description: *Spratela fimbriata* Valenciennes, 1847: 359, Pl. 601 [Histoire naturelle des poissons v. 20].
Synonyms: -
Type: Malabar coast, India. Lectotype: MNHN 0000-3227. Paralectotypes: MNHN B-3084 [ex MNHN 0000-3227] (4). Type catalog: Bertin, 1940:287, Whitehead & Bauchot (1986: 29). Lectotype selected by Whitehead (1967: 50). On Official List of Specific Names in Zoology (Opinion 901).
Distribution: Indo-West Pacific: from Kuwait to southern India and the Bay of Bengal to the Philippines, also the eastern tip of Papua New Guinea.
Environment: Pelagic-neritic.
Depth range: 0-50 m.
IUCN: Least Concern (LC).

***Tenualosa* Fowler, 1934**

Tenualosa (subgenus of *Hilsa*) Fowler 1934: 246 [Proceedings of the Academy of Natural Sciences of Philadelphia v. 85 (for 1933)] Fem. *Alosa reevesii* Richardson 1846. Type by original designation. Misspelled *Tennalosa* in Zoological Record for 1934.

21) *Tenualosa toli* (Valenciennes, 1847) - Toli shad

Original description: *Alausa toli* Valenciennes, 1847: 435 [Histoire naturelle des poissons v. 20].

Synonyms: *Alausa argyrochloris* Valenciennes, 1847; *Alausa ctenolepis* Bleeker, 1852.

Type: Puducherry, India. Lectotype: MNHN 0000-3939 (dry). Paralectotypes: MNHN 0000-3940 (1, dry), 0000-3684 (1). Type catalog: Whitehead & Bauchot (1986: 9). Lectotype selected by (Whitehead 1967: 93).

Distribution: Indo-West Pacific; Mauritius (Mascarenes) and Persian Gulf east to western Indonesia, north to south China Sea.

Environment: Pelagic-neritic.

Depth range: 10 m.

IUCN: Vulnerable (VU).

22) *Tenualosa ilisha* (Hamilton, 1822) - Hilsa shad

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

Synonyms: *Clupea palasah* Cuvier, 1829.

Type: Ganges estuaries, Patua, Goyakarra, Calcutta, and Dhasa, India. No types known. Hamilton's original illustration reproduced by Britz (2019: Pl. 137).

Distribution: Indian Ocean: Persian Gulf eastward to Myanmar, including western and eastern coasts of India. Reported from the Gulf of Tonkin, Viet Nam. Reported in Tigris River basin and probably other rivers of southern Iran.

Environment: Pelagic-neritic.

Depth range: 0-200 m.

IUCN: Least Concern (LC).

Family: Dussumieriidae (two genera and four species)

***Dussumieria* Cuvier & Valenciennes, 1847**

Dussumieria Valenciennes 1847: 467 [Histoire naturelle des poissons v. 20; Fem. *Dussumieria acuta* Valenciennes, 1847. Type by monotypy.

23) *Dussumieria acuta* (Valenciennes, 1847) - Rainbow sardine

Original description: *Dussumieria acuta* Valenciennes, 1847: 467, Pl. 606 [Histoire naturelle des poissons v. 20].

Synonyms: *Clupea flosmaris* Richardson, 1846; *Dussumieria elopsoides* Bleeker, 1849; *Dussumieria hasseltii* Bleeker, 1851; *Dussumieria productissima* Chabanaud, 1933; *Etrumeus albulina* Fowler, 1934.

Type: Coromandel, southeastern India. Lectotype: MNHN 0000-3697. Paralectotypes: MNHN B-3074 [ex MNHN 0000-3697] (1), 0000-3217 (9), 0000-3694 (4), 0000-3964 (3). Type catalog: Bertin 1940:299, Whitehead and Bauchot (1986: 13), Hata et al. (2020: [3]). Lectotype selected by Whitehead (1967: 13). On Official List of Specific Names in Zoology (Opinion 901).

Distribution: Indo-West Pacific: Somalia, Oman, Persian Gulf, and Madagascar east to South China Sea, north to Taiwan.

Environment: Pelagic-neritic.

Depth range: 10-20 m.

IUCN: Least Concern (LC).

24) *Dussumieria elopsoides* (Bleeker, 1849) - Slender rainbow sardine

Original description: *Dussumieria elopsoides* Bleeker 1849: 12 [Verhandelingen van het Bataviaasch Genootschap van Kunsten en Wetenschappen. v. 22 [8].

Synonyms: *Dussumieria acuta* Valenciennes, 1847; *Dussumieria hasseltii* Bleeker, 1851; *Dussumieria productissima* Chabanaud, 1933.

Type: Madura Straits near Kammal and Surabaya; Jakarta and Semarang, etc. Java, Indonesia. Lectotype: BMNH 1867.11.28.17. Paralectotypes: RMNH 7129 (16). Type catalog: Whitehead et al. (1966: 30). Lectotype selected by Whitehead et al. (1966: 30).

Distribution: Indo-Pacific: Suez and the western Indian Ocean (the Persian Gulf to Mombasa; possibly to Madagascar) to China, the Arafura Sea, and to about Tonga. Previous records of *Dussumieria acuta* from the northeastern Indian Ocean would refer to this species.

Environment: Pelagic-neritic.

Depth range: 0-200 m.

IUCN: Least Concern (LC).

***Etrumeus* Bleeker, 1853**

Etrumeus Bleeker 1853: 48 [Verhandelingen van het Bataviaasch Genootschap van Kunsten en Wetenschappen. v. 25 (art. 7)] Masc. *Clupea micropus* Temminck & Schlegel, 1846. Type by monotypy.

25) *Etrumeus golanii* DiBattista, Randall & Bowen, 2012

Original description: *Etrumeus golanii* Di Battista, Randall & Bowen 2012: 451, fig. 1 [Cybium v. 36 (no. 3)].

Synonyms: *Alosa teres* DeKay, 1842.

Type: Limassol, Republic of Cyprus. Holotype: HUJ 18422. Paratypes: AMS 33822-006 (2); BPBM 41058 (2); HUJ 5903 (4), 15812 (2), 17000 (1). Plus, non-type material.

Distribution: Western Indian Ocean: from northern Red Sea, to the Mediterranean.

Environment: Pelagic-neritic.

Depth range: 0-50 m.

IUCN: Data deficient (DD).

26) *Etrumeus sadina* (Mitchill, 1814) - Red-eye round herring

Original description: *Clupea sadina* Mitchill 1814: 21 [Report, in part, of Samuel L. Mitchill]

Synonyms: *Alosa teres* DeKay, 1842.

Type: New York, U.S.A. No types known. Also, in Mitchill (1815: 457). Mitchill's species sadina predates teres DeKay; see Randall & DiBattista (2012: 99).

Distribution: Restricted to the northwestern Atlantic: from the Bay of Fundy to the Gulf of Mexico.

Environment: Pelagic-neritic.

Depth range: 0-125 m.

IUCN: Least Concern (LC).

Family: Engraulidae (five genera and 20 species)

***Coilia* Gray, 1830**

Coilia (subgenus of *Engraulis*) Gray 1830: Pl. 85 (v. 1) [Illustrations of Indian zoology] Fem. *Engraulis (Coilia) hamiltonii* Gray, 1830 (= *Mystus ramcarati* Hamilton, 1822). Type by monotypy. Also appeared in Gray, 1831:9 as a new genus.

27) *Coilia dussumieri* Valenciennes, 1848 - Goldspotted grenadier anchovy

Original description: *Coilia dussumieri* Valenciennes, 1848: 81, Pl. 610 [Histoire naturelle des poissons v. 21].

Synonyms: *Leptonurus chrysostigma* Bleeker, 1849; *Coilia quadrifilis* Günther, 1868; *Demicoilia margaritifera* Jordan & Seale, 1926.

Type: Mumbai, India. Lectotype: MNHN 0000-3749. Paralectotypes: MNHN B-3099 [ex MNHN 0000-3749] (3), ?0000-3718 (3). Type catalog: Bertin (1940: 295), Whitehead & Bauchot (1986: 30). Lectotype selected by Whitehead (1967: 154).

Distribution: Indian Ocean: India from Bombay to Calcutta, probably also Myanmar, Thailand and Malaysia. Western Central Pacific: Thailand to Java, presumably also Kalimantan). Valenciennes listed a specimen from Mahé which lies to the south of Cannanore, India but there is no such specimen in Paris.

Environment: Pelagic-neritic.

Depth range: 0-50 m.

IUCN: Least Concern (LC).

28) *Coilia neglecta* Whitehead, 1967 - Neglected grenadier anchovy

Original description: *Coilia neglecta* Whitehead 1968: 33, fig. 4 [Journal of the Marine Biological Association of India v. 9 (no. 1)].

Synonyms: -

Type: Arabian Sea, 21°23'N, 69°46'E, Anton Bruun cruise 4B, station 211A, depth 10 fathoms. Holotype: USNM 213489. Paratypes: BMNH 1967.11.20.560-569 (10). Additional material: BMNH 1967.11.20.407-424 (18), 1967.11.20.425-428 (4), 1967.11.20.429-436 (8), 1967.11.20.437-461 (25), 1967.11.20.462-559 (97).

Distribution: Indian Ocean: Karachi eastward to the Andaman Sea and Penang. Western Central Pacific: Singapore south to Barito River, Kalimantan).

Environment: Pelagic-neritic.

Depth range: 0-50 m.

IUCN: Least Concern (LC).

***Encrasicholina* Fowler, 1938.**

Encrasicholina Fowler 1938: 156 [Monographs of the Academy of Natural Sciences of Philadelphia No. 2] Fem. *Encrasicholina punctifer* Fowler, 1938. Type by original designation (also monotypic).

29) *Encrasicholina devisi* (Whitley, 1940) - Devis' anchovy

Original description: *Amentum devisi* Whitley 1940: 404, fig. 11. [Australian Zoologist v. 9 (pt 4)].

Synonyms: -

Type: Norman River mouth, Gulf of Carpentaria, Queensland, Australia. Holotype: AMS IB.609 [ex AMS I.377]. Paratypes: AMS IB.610 (4). See Myers and Donaldson (2003: 652).

Distribution: Indo-Pacific: widespread in the northern part of the Indian Ocean (Gulf of Aden, but apparently not the Red Sea nor Kenya, the Persian Gulf, India, Andaman Islands) and Western Central Pacific (Indonesia, Thailand, north to at least Taiwan Island, south to northern Australia; also, eastward to Fiji and Tonga).

Environment: Reef-associated.

Depth range: 10-30 m.

IUCN: Least Concern (LC).

30) *Encrasicholina heteroloba* (Rüppell, 1837) - Shorthead anchovy

Original description: *Engraulis heteroloba* Rüppell 1837: 79, Pl. 21 (fig. 4) [Neue Wirbelthiere zu der Fauna von *Abyssinien gehörig*. Fische des Rothen Meeres].

Synonyms: *Stolephorus pseudoheterolobus* Hardenberg, 1933; *Amentum devisi* Whitley, 1940.

Type: Massawa, Eritrea, Red Sea. Holotype: SMF 4305.

Distribution: Indo-Pacific: Red Sea and East Africa to northern Madagascar and the Bay of Bengal; southern Japan and northern coast of Australia to the Solomon Islands, New Caledonia, Fiji, Tonga, and Samoa.

Environment: Reef-associated.

Depth range: 20-50 m.

IUCN: Least Concern (LC).

31) *Encrasicholina punctifer* (Fowler, 1938) - Buccaneer anchovy

Original description: *Encrasicholina punctifer* Fowler 1938: 157, Pl. 7 (fig. 13) [Monographs of the Academy of Natural Sciences of Philadelphia No. 2].

Synonyms: *Stolephorus buccaneeri* Strasburg, 1960.

Type: Fare Bay, Huaheine Island, Society Islands [French Polynesia, South Pacific]. Holotype: ANSP 68308. Paratypes: ANSP 68309-20 (12), 68321-24 (4, missing). Type catalog: Böhlke (1984: 101).

Distribution: Indo-Pacific: Red Sea and Persian Gulf south to perhaps Durban in South Africa, Pakistan, India, Sri Lanka, and probably Burma. Also, from southern Japan to China, Philippines, Thailand, Indonesia south to Brisbane, Australia, Japan eastward to Hawaii, the Solomon Islands, Fiji, Samoa and Tahiti.

Environment: Reef-associated.

Depth range: -

IUCN: Least Concern (LC).

32) *Encrasicholina gloria* Hata & Motomura, 2016 - Red Sea anchovy

Original description: *Encrasicholina gloria* Hata & Motomura 2016: 80, fig. 2 [Raffles Bulletin of Zoology v. 64].

Synonyms: *Encrasicholina punctifer* Fowler, 1938.

Type: Fare Bay, Huaheine Island, Society Islands [French Polynesia, South Pacific]. Holotype: MNHN 1966-0646. Paratypes: BMNH 1984.5.16.9-13 (5), HUJ, KAUM-I, MNHN.

Distribution: Western Indian Ocean: Persian Gulf (Oman, Khasab), Red Sea (Egypt and Saudi Arabia) and from the eastern Mediterranean (Israel).

Environment: Pelagic-neritic.

Depth range: -

IUCN: Data deficient (DD).

***Stolephorus* Lacepède, 1803**

Stolephorus Lacepède 1803: 381 [Histoire naturelle des poissons (Lacepède) v. 5] Masc. *Stolephorus commersonnii* Lacepède, 1803. Type designated by ICZN and name placed on Official List (Opinion 93 and 749).

33) *Stolephorus commersonnii* (Lacepède, 1803) - Commerson's anchovy

Original description: *Stolephorus commersonnii* Lacepède (ex Commerson) 1803: 381, 382, Pl. 12 (fig. 1) [Histoire naturelle des poissons (Lacepède) v. 5].

Synonyms: *Stolephorus extensus* Jordan & Seale, 1926; *Stolephorus rex* Jordan & Seale, 1926.

Type: Mauritius, Mascarenes, southwestern Indian Ocean [no locality]. Neotype: MCZ 6133. Type catalog: Whitehead & Bauchot (1986: 50). Should be spelled commersonnii. Based on Commerson drawing and notes. *Stolephorus commersonianus* is an incorrect subsequent spelling (see entry in Official Index). Neotype designated by Hata et al. (2021: 19).

Distribution: Indian Ocean: endemic off Mauritius. Its distribution in eastern coast of Africa, from Gulf of Aden to Zanzibar, northern Madagascar, eastward to Hong Kong and Papua New Guinea is based on misidentifications for other species: *Stolephorus mercurius*, *S. rex* and *S. zephyrus*.

Environment: Pelagic-neritic.

Depth range: 0-50 m.

IUCN: Least Concern (LC).

34) *Stolephorus indicus* (van Hasselt, 1823) - Indian anchovy

Original description: *Engraulis indicus* van Hasselt 1823: 329 [Algemeene Konst- en Letter-bode voor het Jaar I Deel (no. 21)].

Synonyms: *Clupea schaleb* Fabricius, 1775; *Elops albus* Swainson, 1839; *Engraulis balinensis* Bleeker, 1849; *Engraulis russellii* Bleeker, 1852; *Engraulis samaminan* Thiollièr, 1857; *Anchovia scitula* Fowler, 1911; *Stolephorus extensus* Jordan & Seale, 1926; *Stolephorus insularum* Jordan & Seale, 1926; *Stolephorus nanus* Hardenberg, 1933.

Type: Pamban Island, Tamil Nadu, India [Vizagapatam, India]. Neotype: USNM 276475. Based on Russel 1803, II, p. 71, Pl. CLXXXVII (see Alfred, 1961: 83; Kottelat, 1987: 370). Nomen protectum according to Fricke (2008: 16). Also, in van Hasselt (1824: 92). Neotype designated by Hata et al. (2021:28).

Distribution: Indo-Pacific: Red Sea and South Africa, including the Persian Gulf, Madagascar and Mauritius eastward to Hong Kong, the Arafura Sea, northern and eastern coasts of Australia and further east to Samoa and Tahiti.

Environment: Pelagic-neritic.

Depth range: 20-50 m.

IUCN: Least Concern (LC).

35) *Stolephorus insularis* Hardenberg, 1933 - Lined rock skipper

Original description: *Stolephorus oceanicus insularis* Hardenberg 1933: 261 [Natuurkundig Tijdschrift voor Nederlandsch Indië v. 93 (no. 2)].

Synonyms: *Stolephorus bataviensis* Hardenberg, 1933; *Stolephorus baweanensis* Hardenberg, 1933; *Stolephorus oceanicus* Hardenberg, 1933.

Type: Mouth of Merggatal River, Kota Kinabalu, Sabah, Malaysia, 06°03-05'N, 116°07-09'E, depth 2 meters. [southern coast of Java, Indonesia.] Neotype: KAUM-I 22316. Appeared first briefly as above; then in Hardenberg (1934: 350). Neotype designated by Hata et al. (2019: 25).

Distribution: Indo-Pacific: northern part of the Indian Ocean (Gulf of Aden, not Red Sea or the Persian Gulf, eastward to Burma) and western Pacific (Gulf of Thailand, Java Sea, also Hong Kong, Fujian and Taiwan Island; if correctly identified, then reaches to Fiji and Samoa). Mediterranean: Tel Aviv, Israel.

Environment: Reef-associated.

Depth range: 0-3 m.

IUCN: Data deficient (DD).

***Engraulis* Cuvier, 1816**

Engraulis Cuvier 1816: 174 [Le Règne Animal v. 2] Fem. *Clupea encrasicolus* Linnaeus, 1758. Type by subsequent designation. Type designated by Fleming (1822: 385) according to Whitehead (1967: 124). See Whitley (1935: 136) for possible earlier publication. Genus name misspelled *Langraulis* by Gruvel & Bouyat (1906: 156).

36) *Engraulis encrasicolus* (Linnaeus, 1758) - European anchovy

Original description: *Clupea encrasicolus* Linnaeus 1758: 318 [Systema Naturae, Ed. X v. 1].

Synonyms: *Engraulis amara* Risso, 1827; *Engraulis vulgaris* Nilsson, 1832; *Engraulis argyrophanus* Valenciennes, 1848; *Engraulis capensis* Gilchrist, 1913; *Engraulis atlantica* de Buen, 1926; *Engraulis atlanticus* Pusanov & Zeeb, 1926; *Engraulis maeoticus* Pusanov & Zeeb, 1926; *Engraulis mediterraneus* Pusanov & Zeeb, 1926; *Engraulis pontica* Pusanov & Zeeb, 1926; *Engraulis aquitanicus* Aleksandrov, 1927; *Engraulis ponticus* Aleksandrov, 1927; *Engraulis meletta* Cuvier, 1829; *Engraulis symaetensis* Dulzetto, 1938; *Engraulis russoi* Dulzetto, 1947; *Engraulis oliveri* Scuderi, 1957; *Anchoviella guineensis* Rossignol & Blache 1961.

Type: 18 nautical miles off Sète, Gulf of Lyon, France, northwestern Mediterranean Sea. MNHN 2002-1775. Neotype designated by Fricke (1999: 20), but withdrawn in Fricke (2000: 639). Neotype designated by Borsa et al. (2004: 1113). Spelled *encrasiolus* in Brünnich (1768: 83). Sometimes spelled *encrasicholus* or *encrassicolus*.

Distribution: Eastern Atlantic: Bergen, Norway to East London, South Africa (perhaps reaching Durban). Also, all of Mediterranean, Black and Azov seas, with stray individuals in Suez Canal and Gulf of Suez; also recorded from St. Helena. Reported from Estonia.

Environment: Pelagic-neritic.

Depth range: 0-400 m.

IUCN: Least Concern (LC).

***Thryssa* Cuvier, 1829**

Thryssa Cuvier 1829: 323 [Le Règne Animal (Edition 2) v. 2] Fem. *Clupea setirostris* Broussonet, 1782. Type by subsequent designation. Type by subsequent designation of Jordan (1917: 98). Considered by some authors as a new spelling for *Thrissa* Cuvier, 1816, preoccupied by *Thrissa* Rafinesque, 1815 in fishes (see Whitehead, 1967: 140), and if regarded as such then type would be same as for *Thrissa* Cuvier (*Clupea mystus* Linnaeus, 1758). Here regarded as independent of *Thrissa* Cuvier, 1816, for the sake of stability.

37) *Thryssa baelama* (Forsskål, 1775) - Baelama anchovy

Original description: *Clupea baelama* Fabricius in Niebuhr (ex Forsskål) 1775: 72, xiii [Descriptiones animalium (Forsskål)].

Synonyms: *Clupea tuberculosa* Lacepède, 1803; *Engraulis nesogallicus* Bennett, 1832; *Engraulis samam* Montrouzier, 1857; *Engraulis polynemoides* Günther, 1868; *Anchovia evermanni* Jordan & Seale, 1906; *Engraulis macrops* Kishinouye, 1911.

Type: No locality stated (Red Sea). No types known. Originally *Clupea baelama, encrasicolus?* on p, 72, *Clupea encrasicolus* on p. xiii. Authorship according to Fricke (2008: 16). Also spelled *boelama* by authors. We assume *encrasicolus* refers to Linnaeus, 1758 and that *baelama* is an available name.

Distribution: Indo-Pacific: widespread in Indian Ocean, including Red Sea, coasts of East Africa to Madagascar and Mauritius, Sri Lanka and Andaman Islands, but no Indian specimens known; and in western central Pacific, including Indonesia, the Philippines, Papua New Guinea, northern and eastern coasts of Australia, and eastward to Tonga. No records are known from South China Sea or to the north, but the Ogasawara, Bonin Islands, record seems reliable. Its occurrence in Thailand needs confirmation.

Environment: Reef-associated.

Depth range: 0-50 m.

IUCN: Least Concern (LC).

38) *Thryssa hamiltonii* (Gray, 1835) - Hamilton's thryssa

Original description: *Thrissa hamiltonii* Gray 1835: no page number, Pl. 92 (fig. 3) [Illustrations of Indian zoology].

Synonyms: *Engraulis grayi* Bleeker, 1851; *Engraulis nasutus* Castelnau, 1878.

Type: Parengipettai, Tamil Nadu State, India. Neotype: BMNH 1979.8.15.1. Published about 20 Feb. 1935. Based on a Hardwicke drawing. Neotype designated by Hata et al. (2022: 2).

Distribution: Indo-Pacific: Persian Gulf eastward to Myanmar, Andamans and Penang; Taiwan south to Arafura Sea, the northern coasts of Australia and Papua New Guinea; Sarawak; a record from the Bonin Islands; presumably the Philippines; perhaps not eastward to the Hebrides, etc.

Environment: Pelagic-neritic.

Depth range: 10-13 m.

IUCN: Least Concern (LC).

39) *Thryssa setirostris* (Broussonet, 1782) - Longjaw thryssa

Original description: *Clupea setirostris* Broussonet (ex Forster) 1782: [47], Pl. [11] [Ichthyologia, sistens piscium descriptiones et icones. Decas I.].

Synonyms: *Thryssa macrognathos* Bleeker, 1849.

Type: Tanna Island, Vanuatu, southwestern Pacific. No types known. On unnumbered p. 47 and unnumbered Pl. 11. Neotype designation by Fricke (1999: 78) is invalid; see Fricke (2000: 639).

Distribution: Indo-Pacific: India Ocean from Gulf of Oman south to Port Alfred, but no records from the Red Sea and Madagascar; coasts of Pakistan, India and probably Burma; Thailand, Indonesia, Philippines to Taiwan, including Arafura Sea; also, northern Australia, Papua New Guinea, Solomon Islands and New Hebrides.

Environment: Pelagic-neritic.

Depth range: 0-20 m.

IUCN: Least Concern (LC).

40) *Thryssa vitrirostris* (Gilchrist & Thompson, 1908) - Orangemouth anchovy

Original description: *Engraulis vitrirostris* Gilchrist & Thompson 1908: 201 [Annals of the South African Museum v. 6 (pt 2)].

Synonyms: -

Type: Inner harbor, Durban, South Africa, southwestern Indian Ocean. Lectotype: SAM 9932. Paralectotypes: SAM 9931 (1, headless), 9746 (1, headless). Lectotype selected by Hata & Motomura (2019: 5).

Distribution: Indian Ocean: Madagascar; coasts of Africa from Port Alfred northward to the Persian Gulf, but not in the Red Sea; coasts of Pakistan and India, perhaps to Calcutta and off Myanmar, but no records. Also, from lower Zambezi delta in Mozambique.

Environment: Pelagic-neritic.

Depth range: 0-50 m.

IUCN: Least Concern (LC).

41) *Thryssa dayi* Wongratana, 1983 - Day's thryssa

Original description: *Thryssa dayi (Scutengraulis)* Wongratana 1983: 404, fig. 24 [Japanese Journal of Ichthyology v. 29 (no. 4)].

Synonyms: -

Type: Mumbai, India. Holotype: BMNH 1889.2.1.1803. Paratypes: BMNH 1860.3.19.820 (1), 1889.2.1.1802 (1), 1965.7.12.249-250 (2), 1965.7.12.251-255 (5). Other specimens: BMNH 1889.2.1.1794 (1), BMNH 1969.8.19.9. (1).

Distribution: Western Indian Ocean: entire western coast of India north to Pakistan, possibly to Gulf of Oman.

Environment: Pelagic-neritic.

Depth range: 0-50 m.

IUCN: Data deficient (DD).

42) *Thryssa dussumieri* (Valenciennes, 1848) - Dussumier's thryssa

Original description: *Engraulis dussumieri* Valenciennes 1848: 69 [Histoire naturelle des poissons v. 21].

Synonyms: *Engraulis auratus* Day, 1865; *Trichosoma adelae* Rutter, 1897.

Type: Gulf of Khambhat, Gujarat, India, Arabian Sea (originally no type locality). Neotype: BMNH 1966.11.30.1. Type catalog: Whitehead & Bauchot (1985: 48). Putative neotype designated by Whitehead (1967: 142), accepted by Whitehead & Bauchot (1986: 48); and in addition, Kottelat (2013) designates the neotype.

Distribution: Indo-Pacific: coasts of Pakistan, India, Myanmar and south of Penang; apparently not yet found in Gulf of Oman nor in the Persian Gulf; Malaysia, Indonesia north to Taiwan, no records from Papua New Guinea or northern coasts of Australia.

Environment: Pelagic-neritic.

Depth range: 0-50 m.

IUCN: Least Concern (LC).

43) *Thryssa malabarica* (Bloch, 1795) - Malabar thryssa

Original description: *Clupea malabaricus* Bloch 1795: 115, Pl. 432 [Naturgeschichte der ausländischen Fische v. 9].

Synonyms: *Clupea cuvierii* Swainson, 1839.

Type: Tranquebar [Tharangambadi], India. Syntypes: ZMB 8804 (1, dry, lost). Type catalog: Paepke, 1999:65. Spelled *malabarica* on plate. Spelled *malabar* in Lacepède (1803: 459). Whitehead (1969: 274) suggested a putative neotype (BMNH 1868.10.25.27). On p. 116 of Bloch's Ichthyologie, v. 12.

Distribution: Indian Ocean: India, perhaps reaching to Pakistan, but not recorded from the Gulf and the Red Sea, its place in the Gulf being taken by *Thryssa whiteheadi*.

Environment: Pelagic-neritic.

Depth range: 0-50 m.

IUCN: Data deficient (DD).

44) *Thryssa mystax* (Bloch & Schneider, 1801) - Moustached thryssa

Original description: *Clupea mystax* Bloch & Schneider 1801: 426, Pl. 83 [M. E. Blochii, Systema Ichthyologiae].

Synonyms: *Clupea subspinosa* Swainson, 1839; *Engraulis mystacoides* Bleeker, 1852; *Thryssa poorawa* Jerdon, 1853; *Stolephorus valenciennesi* Bleeker, 1866; *Engraulis poorawah* Bleeker, 1872; *Engraulis hornelli* Fowler, 1924.

Type: Malabar, India. Holotype (unique): ZMB 3884. Type catalog: Paepke (1999: 78).

Distribution: Indo-West Pacific: western coast of India to Myanmar and south to Java, Indonesia.

Environment: Pelagic-oceanic.

Depth range: 0-50 m.

IUCN: Least Concern (LC).

45) *Thryssa whiteheadi* Wongratana, 1983 - Whitehead's thryssa

Original description: *Thryssa whiteheadi (Scutengraulis)* Wongratana 1983: 403, fig. 22 [Japanese Journal of Ichthyology v. 29 (no. 4)].

Synonyms: -

Type: Basra, Iraq, Persian Gulf. Holotype: BMNH 1920.3.3.192. Paratypes: BMNH 1920.3.3.183-191 (18); ZMUC CN.3-4 (2).

Distribution: Western Indian Ocean: known only from the Persian Gulf, but perhaps reaches into the Gulf of Oman.

Environment: Pelagic-neritic.

Depth range: -

IUCN: Least Concern (LC).

46) *Thryssa purava* (Hamilton, 1822) - Oblique-jaw thryssa

Original description: *Clupea purava* Hamilton 1822: 238, 382 [An account of the fishes found in the river Ganges].

Synonyms: *Clupea megastoma* Swainson, 1839; *Engraulis annandalei* Chaudhuri, 1916; *Engraulis kempi* Chaudhuri, 1916; *Engraulis rambhae* Chaudhuri, 1916.

Type: Ganges estuaries. No types known. Hamilton's original, unpublished illustration reproduced by Britz (2019: Pl. 135).

Distribution: Indian Ocean: eastern coasts of India; possibly also Myanmar.

Environment: Pelagic-neritic.

Depth range: 0-50 m.

IUCN: Data deficient (DD).

Family: Pristigasteridae (three genera and eighth species)

***Ilisha* Richardson, 1846**

Ilisha Richardson (ex Gray) 1846: 306 [Report of the British Association for the Advancement of Science 15th meeting [1845]] Fem. *Ilisha abnormis* Richardson, 1846. Type usually regarded as by monotypy, but second species cited by scientific name in footnote and apparently included in *Ilisha*; earliest type designation possibly by Jordan (1919: 227).

47) *Ilisha megaloptera* (Swainson, 1839) - Bigeye ilisha

Original description: *Clupea megalopterus (Platygaster)* Swainson 1839: 294 [The natural history and classification v. 2].

Synonyms: *Clupea purava* Hamilton, 1822; *Engraulis annandalei* Chaudhuri, 1916; *Engraulis kempi* Chaudhuri, 1916; *Engraulis rambhae* Chaudhuri, 1916.

Type: Coromandel Coast, India (original locality: Vizagapatham, India). Neotype: MNHN 3708. Based on drawing in Russell, 1803:Pl. 191, Jangarloo. Neotype designated by Kottelat (2013).

Distribution: Indo-Pacific: Indian Ocean (Bombay to Bay of Bengal and Andaman coast of Thailand), Java Sea (off Java, Singapore). Sarawak, `Cochinchina' and Macao specimens should be rechecked.
Environment: Pelagic-neritic.
Depth range: 0-50 m.
IUCN: Least Concern (LC).

48) *Ilisha melastoma* (Bloch & Schneider, 1801) - Indian ilisha
Original description: *Clupea melastoma* Bloch & Schneider 1801: 427 [M. E. Blochii, Systema Ichthyologiae].
Synonyms: *Platygaster verticalis* Swainson, 1838; *Clupea indicus* Swainson, 1839; *Pellona ditchoa* Valenciennes, 1847; *Pellona micropus* Valenciennes, 1847; *Pellona brachysoma* Bleeker, 1852; *Pellona schlegelii* Bleeker, 1853.
Type: Near Coromandel, Tamil Nadu, India Holotype (unique): ZMB 3842. Type catalog: Paepke (1999: 65) with locality as Indian Ocean. Declared a nomen oblitum by Whitelead (1967: 11).
Distribution: Indo-Pacific: Indian Ocean (Malabar coast to Calcutta), Java Sea (off Java), Arafura Sea, South China Sea (Singapore, Gulf of Thailand), East China Sea (north to Taiwan Island).
Environment: Pelagic-neritic.
Depth range: 0-50 m.
IUCN: Least Concern (LC).

49) *Ilisha sirishae* Seshagiri Rao, 1975 - Lobejaw ilisha
Original description: *Ilisha sirishai* Seshagiri Rao 1975: 464, figs. 1-2 [Hydrobiologia v. 47 (no. 3-4)].
Synonyms: -
Type: Vizagapatam, India. Holotype: BMNH 1975.9.24.48. Paratypes: BMNH 1975.9.24.49-60 (12), Mus. Dept. Zool. D.N.R. College, Bhimavaram (2). Named after Miss A. V. S. Sirisha, daughter of the author's cousin, therefore mandatory correction to *sirishae*.
Distribution: Indo-West Pacific: Persian Gulf to the Bay of Bengal and Andaman coast of Thailand to the Gulf of Thailand (Songkhla Lake).
Environment: Pelagic-neritic.
Depth range: 0-50 m.
IUCN: Data deficient (DD).

50) *Ilisha striatula* Wongratana, 1983 - Banded ilisha
Original description: *Ilisha striatula* Wongratana 1983: 396, fig. 13 [Japanese Journal of Ichthyology v. 29 (no. 4)].
Synonyms: -
Type: Pakistan, 25°11'N, 66°20'E. Holotype: BMNH 1968.8.26.2. Paratypes: BMNH 1898.6.29.184 (1), 1969.11.6.5-6 (2), 1975.3.20.696-699 (4), 1975.3.20.700-709 (10). Other specimens: BMNH (36).
Distribution: Indian Ocean: Karachi to Madras and perhaps north to Calcutta. Specimens from the northwestern coasts of Australia may be this species. Almost certainly mistaken in the past for the very similar *Ilisha melastoma* in Indian waters.
Environment: Pelagic-neritic.
Depth range: 0-50 m.
IUCN: Data deficient (DD).

51) *Ilisha compressa* Randall, 1994 - Compressed ilisha
Original description: *Ilisha compressa* Randall 1994: 895, fig. 1 [Raffles Bulletin of Zoology v. 42 (no. 4)].
Synonyms: -
Type: Kuwait Bay, Kuwait, Persian Gulf, depth 8-10 meters. Holotype: BPBM 33196. Paratypes: BMNH 1974.7.22.4 (1); BPBM 36412 (1); USNM 329752 (1).
Distribution: Western Indian Ocean.
Environment: Pelagic-neritic.

Depth range: 8-10 m.
IUCN: Least Concern (LC).

***Opisthopterus* Gill, 1861**

Opisthopterus Gill 1861: 38 [Proceedings of the Academy of Natural Sciences of Philadelphia v. 13] Masc. *Pristigaster tartoor* Valenciennes, 1847 (= *Pristigaster tardoore* Cuvier, 1829). Type by original designation (also monotypic).

52) *Opisthopterus valenciennesi* Bleeker, 1872 – Blackline fangblenny

Original description: *Opisthopterus valenciennesi* Bleeker 1872: 124 [Atlas ichthyologique des Indes Orientales Néêrlandaises].
Synonyms: -
Type: Jakarta, Java, Indonesia; Singapore. Lectotype: BMNH 1865.9.24.1. Paraectotypes: RMNH 7124 (5). Based on *Opisthopterus tartoor* of Bleeker (1872: 124), not of Valenciennes. Lectotupe designated by Whitehead et al. (1966: 106).
Distribution: Indo-West Pacific: Java Sea, Singapore north to East China Sea at Foochow.
Environment: Pelagic–neritic.
Depth range: -
IUCN: Data deficient (DD).

53) *Opisthopterus tardoore* (Cuvier, 1829) - Blackline fangblenny

Original description: *Opisthopterus tardoore* Cuvier 1829: 321 [Le Règne Animal (Edition 2) v. 2].
Synonyms: *Pristogaster elongate* Swainson, 1838; *Clupea indicus* Swainson, 1839; *Pristigaster tartoor* Valenciennes, 1847; *Opisthopterus macrognathus* Bleeker, 1866.
Type: Puducherry, India. Neotype: MNHN 0000-1688. Type catalog: Bertin (1940: 294), Whitehead & Bauchot (1986: 25). Available from footnote as, "*Pr. tardoore*, N., Russel, 193." Neotype designated by Whitehead (1967: 122).
Distribution: Indo-West Pacific: in tropical waters, from the Gulf of Oman to at least Madras, perhaps to the north and along the coasts of Myanmar, certainly at Penang, to the Java Sea, and Gulf of Thailand.
Environment: Pelagic–neritic.
Depth range: -
IUCN: Least Concern (LC).

***Pellona* Valenciennes, 1847**

Pellona Valenciennes, 1847: 300 [Histoire naturelle des poissons v. 20] Fem. *Pellona orbignyana* Valenciennes, 1847. Type by subsequent designation. Type designated by Gill (1861: 38) (see Whitehead, 1967: 105).

54) *Pellona ditchela* Valenciennes, 1847 - Indian pellona

Original description: *Pellona ditchela* Valenciennes, 1847: 314 [Histoire naturelle des poissons v. 20].
Synonyms: *Pellona hoevenii* Bleeker, 1852; *Pellona natalensis* Gilchrist & Thompson, 1908.
Type: Vizagapatam, India. No types known. Type catalog: Whitehead and Bauchot (1986: 44). Based on Russell (1803: 72, Pl. 188).
Distribution: Indo-West Pacific: Indian Ocean: east coast of Africa northward from about Durban to the Gulf of Oman, including Madagascar, the coasts of India and Andaman Sea, and south to western Australia; also, South China Sea, and Indonesia to northern Australia and Papua New Guinea.
Environment: Pelagic–neritic.
Depth range: 10-55 m.
IUCN: Least Concern (LC).

Family Spratelloididae (one genus and two species)

***Spratelloides* Bleeker, 1851**

Spratelloides Bleeker 1851: 214 [Natuurkundig Tijdschrift voor Nederlandsch Indië v. 2 (no. 2)] Masc. *Clupea argyrotaeniata* Bleeker, 1852 (*Spratelloides gracilis* (Temminck & Schlegel, 1846)). Type by monotypy. Appeared first as "*Spratelloïdes argyrotaenia* Blkr. = *Clupea argyrotaenia* Blkr. Makassar.

55) *Spratelloides delicatulus* (Bennett, 1832) - Delicate round herring

Original description: *Clupea delicatula* Bennett 1832: 168 [Proceedings of the Committee of Science and Correspondence of the Zoological Society of London 1830-31 (pt 1)].

Synonyms: *Clupea flosmaris* Richardson, 1846; *Clupea macassariensis* Bleeker, 1849; *Alosa alburnus* Kner & Steindachner, 1867.

Type: Mauritius, Mascarenes, southwestern Indian Ocean. No types known.

Distribution: Red Sea; Indo-West Pacific: East Africa, South Africa, Persian Gulf, Seychelles, Madagascar and western Mascarenes east to Hawaiian Islands and Tuamotu Archipelago, north to southern Japan, south to Western Australia, Tasmania (Australia), and New Caledonia; Mediterranean Sea (Red Sea immigrant).

Environment: Reef-associated.

Depth range: 0-200 m.

IUCN: Least Concern (LC).

56) *Spratelloides gracilis* (Temminck & Schlegel, 1846) - Silver-stripe round herring.

Original description: *Clupea gracilis* Temminck & Schlegel 1846: 238, Pl. 108 (fig. 2) [Fauna Japonica Parts 10-14].

Synonyms: *Spratelloides atrofasciatus* Schultz, 1943; *Clupea argyrotaeniata* Bleeker, 1849.

Type: Southeastern coasts of Nagasaki, Japan. Lectotype: RMNH 3260a. Paralectotypes: RMNH 3260b-k (10). Lectotype selected by Boeseman (1947: 175).

Distribution: Red Sea; Indo-West Pacific: East Africa east to Tuamotu Archipelago, north to Korea and Japan, south to Western Australia and Queensland (Australia).

Environment: Pelagic-neritic.

Depth range: 0-40 m.

IUCN: Least Concern (LC).

Discussion

Using the survey data, published literature and online databases, we compiled a complete fish inventory of the order Clupeiformes in the North-Western Indian Ocean, and a total of 56 fish species were listed. During the last 10 years seven new species have been described from the region:

i) A new species of anchovy (Large head anchovy), *Encrasicholina macrocephala* Hata & Motomura, 2015, is described on the basis of 17 specimens collected from the Red Sea and the Arabian Sea. The species is closely related to *E. devisi* in that both species have three unbranched rays in the dorsal and anal fins, and a long upper jaw (posterior tip extending beyond posterior margin of preopercle).

ii) Two new anchovies, *Encrasicholina intermedia* and *E. gloria* are described by H. Hata and H. Motomura, in 2016, from the western Indian Ocean, and Persian Gulf, Red Sea and Mediterranean, respectively. Both species resemble *E. punctifer* in having a short upper jaw (posterior tip not reaching to anterior margin of preopercle) and well-developed needle-like scutes on the anteroventral body. *Encrasicholina intermedia* differs from *E. punctifer* and *E. gloria* in having 46–50, 36–38, 23–25 and 19–21 gill rakers on the first, second, third and fourth gill arches, respectively. *Encrasicholina gloria* is distinguished from the other two species by having a longer first unbranched dorsal-fin ray.

iii) *Thrissina cultella*, and *Thrissina serena* are described by H. Hata and H. Motomura, in 2020, from the Bay of Bengal and northwestern Indian Ocean, respectively. Although both species resemble *T. vitrirostris* (Gilchrist & Thompson, 1908), which is redescribed from both type and non-type specimens, in having a long upper jaw (posterior tip reaching to pectoral-fin insertion) and similar numbers of gill rakers and ventral scutes, the two new species differ in having fewer transverse scales (9–10 in both vs. 11–12 in *T. vitrirostris*).

iv) A new fish species, *Stolephorus tamilensis*, is described by Gangan et al. (2020), from the East coast of India. The major distinguishing characters are 5-6 small needle-like pre-pelvic scutes on belly; maxilla tip pointed, reaching to border of operculum, concave and indented in the preoperculum; 25-28 gill rakers on lower lobe of the first branchial arch; dorsal fin without spine; 17-19 anal-fin rays. Moreover, *S. tamilensis* present higher average genetic divergence values at mitochondrial cytochrome c oxidase subunit I and 16S rDNA loci in comparison with congeners.

v) The new anchovy *Stolephorus meteorum*, formerly confused with *Stolephorus indicus*, is described on the basis of 19 specimens collected from the southern Red Sea. Four other species, previously confused with or placed in the synonymy of *S. indicus*, have been either redescribed (*Stolephorus commersonnii*), described as new (*Stolephorus belaerius*), or resurrected from its synonymy (*Stolephorus balinensis* and *Stolephorus scitulus*). The new species shares with the latter four species, plus *S. indicus*, a relatively short maxilla and pelvic fins, and six or fewer prepelvic scutes but differs from them in the combination of some other characters, including intermediate numbers of gill rakers (total gill rakers on first gill arch 40–43, modally 41), 41 vertebrae, a large head and narrower interorbital area, and longer pelvic fins. A genetic analysis of the mitochondrial cytochrome oxidase I gene (COI) of *S. meteorum*, new species, *S. balinensis*, *S. belaerius*, and *S. indicus* revealed each species to be genetically divergent from the others by 2.5–3.6% uncorrected distance.

vi)*Thrissina supra* is described based on 15 specimens collected by Hata et al. (2021), from Sindh, Pakistan. The new species is closely related to *Thrissina whiteheadi* (Wongratana, 1983), which is herein redescribed, both species having a relatively long upper jaw with the posterior tip slightly beyond the opercle posterior margin, the snout tip above the eye center level, similar numbers of gill rakers, ventral scutes, and fin rays, and the first supramaxilla absent. However, the former is characterized by higher counts of longitudinal scale rows (45–47 vs. 40–42 in *T. whiteheadi*), transverse scales (12 or 13 vs. 10 or 11), total gill rakers on the first, second, third, and fourth gill arches [35–39, 33–37, 22–24, and 18–22, respectively vs. 30–34 (rarely 36), 29–32 (34), 19–21 (23), and 15–18 (14, 19), respectively], and branched anal-fin rays [42–45 (rarely 40) vs. 39–42 (43)], a longer snout (3.7–4.1% SL vs. 3.1–3.6%), pelvic fin (9.0–10.4% SL vs. 7.7–9.0%), and mandible (17.3–18.3% SL vs. 15.4–17.2%), a shorter pelvic-fin insertion to anal-fin origin distance (17.0–18.8% SL vs. 19.1–24.2%), and distinct paired dark lines along the dorsum from the occiput to the caudal-fin base (vs. uniformly distributed dorsal melanophores).

A checklist of the clupeoid fishes of Thailand by Thosaporn Wongratana (1980) is species included of Clupeidae (herrings) and Engraulidae (anchovies) family in Thai waters, for which no comprehensive taxonomic list it did not exists until then. In all, 153 species of 33 genera have been recognised (of which 25 species are new). Of these 66 species of 25 genera are here recorded from Thailand. The large number of clupeoid species in Thai waters reflects the fact that the Indo-Australian Archipelago has been the centre of speciation for numerous marine fish families and is one of the richest areas in the world as regards numbers of species and genera. However, the fact that Thai waters include both the Andaman Sea and the Gulf of Thailand does not significantly increase the complement of Thai clupeoid species since the species composition on either side of the country is very similar. The majority of the Thai clupeoid species are marine, but a few are anadromous (e.g., *Tenualosa toli*) and some are strictly freshwater (e.g. *Clupeichthys* sp.).

In the study, Global conservation status of the world's most prominent forage fishes (Teleostei: Clupeiformes) by Birge et al. (2021), applied the IUCN Red List methodology, a comprehensive and systematic approach to assess extinction risk, to all clupeiform species. The best estimate suggests nearly 11% of species are of elevated conservation concern, although this could be as high as 36%. Two regions, the Caribbean and the Indo-Malay-Philippine Archipelago have high concentrations of threatened and Data Deficient species and are areas of conservation concern. Major threats include overexploitation, pollution, and habitat modification.

In a study by Dizaj et al. (2020), on species belonging to the genus *Herklotsichthys*, it was found that *H. dispilonotus*, *H. lossei* and *H. punctaus*, these three species remain in the same genus and three others, *H. quadrimaculatus*, *H. lippa* and *H. spilurus* form a distinct genus.

In the inferred phylogenetic reconstructions (Lavoué et al., 2017), the families Clupeidae and the Dussumieriidae were never recovered as monophyletic. Position of *Sardinella* on the COI tree topology presented here, which has a broad tropical distribution, including the Indo-West Pacific region, and the

East and West Atlantic regions supports Lavoué et al. (2017) idea about unresolved phylogeny of clupeids.

Identification of anchovies (Engraulidae) is often challenging based on morphology because closely related species exhibit only slight morphological differentiation. In the study conducted by Afranda et al. (2020), they implimented morphological characteristics, and DNA barcodes for identification and validation of anchovies in the Persian Gulf and Oman Sea, and identified eight species: *Thryssa hamiltonii*, *T. setirostris*, *T. vitrirostris*, *T. whiteheadi*, *T. dussumieri*, *Encrasicholina punctifer*, *E. pseudoheteroloba*, and *Stolephorus indicus*.

In 2021, the finding of larval and juvenile specimens Clupeidae –*Tenualosa ilisha* (Hamilton, 1822) from the Omani coast of the Arabian Sea and the Arabian Gulf waters of Saudi Arabia and Iraq is reported for the first time (Jawad et al., 2021).

Psomadakis et al. (2015) listed 37 species in five genera in the checklist of Pakistan waters.

Different theories to explain the species diversity of the families in this checklist in the Persian Gulf and the Sea of Oman are discussed. For example, Late Pleistocene Sea level fluctuations, and ecological and geographical differences between the studied locations. Species diversity is different in the two parts of the Persian Gulf and the Sea of Oman because, the Strait of Hormuz and its geographical location play a role as a barrier. In principle, the Strait of Hormuz due to its narrowness, affects the water circulation in the Persian Gulf and environmental conditions in the study areas, and the Strait of Hormuz acts as a barrier (Swift & Bower, 2003; Thoppil & Hogan, 2010b). The phylogeographer interruption between the Persian Gulf and the Gulf of Oman is probably related to the hydrological history of the region in the late Pleistocene. When the sea level went down. from the Last Glacial Maximum (LGM) at about 18,000 until 14,000 years ago the Persian Gulf has been free of marine influence out to the Biaban Shelf edge (Lambeck, 1996; Randall, 1995). Following the Holocene transgression, approximately 18,000 years BP, the present-day form of the Persian Gulf originated. At this time, the sea level was approximately 120 m below its current level (Lambeck, 1996). The drop in sea level in this period may have caused the isolation and divergence of the Persian Gulf species related to the order Clupeiformes from the Oman Sea species. The drying up of the Strait of Hormuz at that time probably led to the isolation between different species of the Persian Gulf and the Gulf of Oman (Ghanbarifardi et al., 2018). Due to the unique conditions of the Persian Gulf, it should be considered as a distinct ecosystem and the Gulf of Oman should be considered as a zoogeographic boundary between the Western Indian Ocean and the Indo-Polynesian provinces (Béarez et al., 2008; Briggs, 1974).

Some of the less-known species, or species from less explored areas, deserve more attention and approval of a similar fine-resolution taxonomy approach, ideally accompanied by comprehensive integrative molecular studies, to more fully understand the overall diversity, the speciation events, and the evolutionary pathways involved in clupeiform systematics and phylogeny. Ongoing research and intensive collections are likely to reveal additional species in the Northwest Indian Ocean.

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