



INTEGRATED TAXONOMIC TECHNIQUES FOR MARINE BIODIVERSITY CONSERVATION

ICAR Sponsored **SHORT COURSE**



18-28 February 2025



Organized by
Indian Council of Agricultural Research
CENTRAL MARINE FISHERIES RESEARCH INSTITUTE

CMFRI Training Manual Series No.48/2025

Course Manual

**ICAR Sponsored Short course on
Integrated Taxonomic techniques for Marine Biodiversity Conservation**

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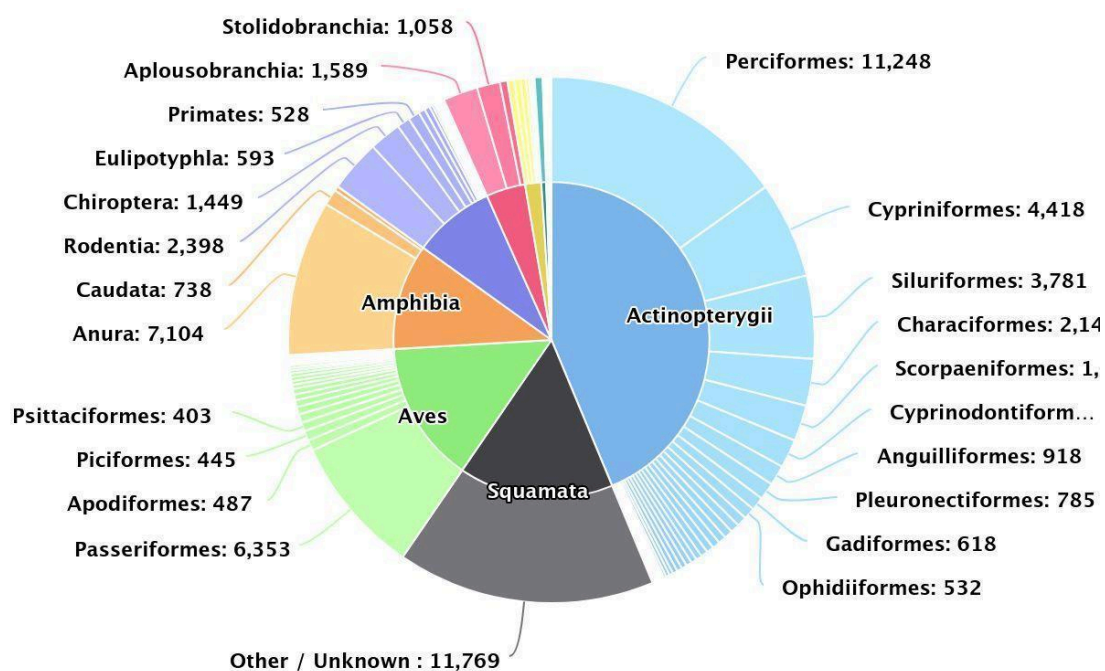
6. Finfish Diversity and Taxonomy

Dr. Rekha J Nair

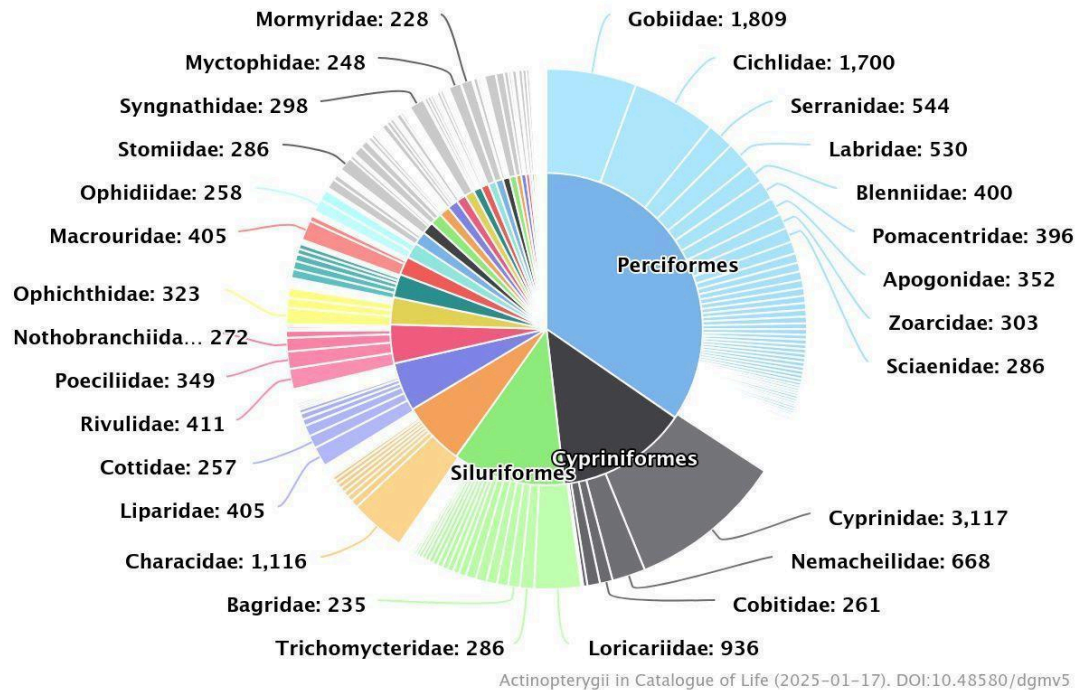
Marine Biodiversity and Environment Management Division, ICAR-Central Marine Fisheries Research Institute, Kochi

According to FishBase about 34,800 species of fish had been described as of February 2022, which is more than the combined total of all other vertebrate species: mammals, amphibians, reptiles and birds. Of the fish species from the world, India supports of about 2923 marine fishes owing to 8.84% of the total marine fish resources. Of the overall fish diversity known from India, the marine fishes make up 62 percent, containing 1838 species and the freshwater species 1048 species contributing to 36 percent. Of the total marine fishes reported, 182 species are deepwater forms.

Among the fish diversity rich areas in the marine waters of India, the Andaman and Nicobar archipelago exhibits the highest number of species, 1431, followed by the east coast of India with 1121 species and the west coast with 1071. We recognize since 91 species of endemic marine fishes to exist in the coastal waters of India. As per Catalogue of Life (2025 online), the species wise breakup is given below



Chordata in Catalogue of Life (2025-01-17). DOI:10.48580/dgmv5



Phylum Chordata has 74333 species; Class Actinopterygii at present has 32513 species in 46 orders, 488 families with 4908 genera.

Class Elasmobranchii with 1266 species includes all cartilaginous fishes.

- **Class Myxini**
 - **Order Myxiniiformes**
 - **Family Myxinidae** Rafinesque 1815 (hagfishes)
 - Subfamily **Rubicundinae** Fernholm, Norén, Kullander, Quattrini et al. 2013 (reddish hagfishes)
 - Subfamily **Eptatretinae** Bonaparte 1850 (multi-gill hagfishes)
 - Subfamily **Myxininae** Rafinesque 1815 (hagfishes)
- **Class Petromyzonti**
 - **Order Petromyzontiformes**
 - **Family Petromyzontidae** Bonaparte 1831 (lampreys)
 - **Family Geotriidae** Gill 1893 (pouched lampreys)
 - **Family Mordaciidae** Gill 1893 (southern topeyed lampreys)
- **Class Elasmobranchii**
 - **Order Hexanchiformes**
 - **Family Hexanchidae** Gray 1851 (cow sharks)
 - **Family Chlamydoselachidae** Garman 1884 (frill sharks)

- o Order **Heterodontiformes**
 - Family **Heterodontidae** Gray 1851 (bullhead sharks or horn sharks)
- o Order **Orectolobiformes**
 - Family **Rhincodontidae** Müller & Henle 1841 (whale sharks)
 - Family **Parascylliidae** Gill 1862 (collared carpet sharks)
 - Family **Brachaeluridae** Applegate 1974 (blind sharks)
 - Family **Orectolobidae** Gill 1896 (wobbegongs)
 - Family **Hemiscylliidae** Gill 1862 (bamboo sharks)
 - Family **Stegostomatidae** Gill 1862 (zebra sharks)
 - Family **Ginglymostomatidae** Gill 1862 (nurse sharks)
- o Order **Lamniformes**
 - Family **Mitsukurinidae** Jordan 1898 (goblin sharks)
 - Family **Carchariidae** Müller & Henle 1838 (sand tigers)
 - Family **Odontaspidae** Müller & Henle 1839 (sand tiger sharks)
 - Family **Pseudocarchariidae** Taylor, Compagno & Struhsaker 1983 (crocodile sharks)
 - Family **Megachasmidae** Taylor, Compagno & Struhsaker 1983 (megamouth sharks)
 - Family **Alopiidae** Bonaparte 1835 (thresher sharks)
 - Family **Cetorhinidae** Gill 1861 (basking sharks)
 - Family **Lamnidae** Bonaparte 1835 (mackerel sharks)
- o Order **Carcharhiniformes**
 - Suborder **Scyliorhinoidei**
 - Family **Scyliorhinidae** Gill 1862 (catsharks)
 - Suborder **Carcharhinoidei**
 - Family **Atelomycteridae** White 1936 (coloured catsharks)
 - Family **Pentanchidae** Smith 1912 (deepwater catsharks)
 - Family **Dichichthyidae** White, Stewart, O'Neill & Naylor 2024 (bristle sharks)
 - Family **Pseudotriakidae** Gill 1893 (false catsharks)
 - Family **Proscylliidae** Fowler 1941 (finback catsharks)

- Family **Leptochariidae** Gray 1851 (barbeled houndsharks)
- Family **Triakidae** Gray 1851 (houndsharks)
 - Subfamily **Triakinae** Gray 1851 (smooth-hounds)
 - Subfamily **Galeorhininae** Gill 1862 (school sharks)
- Family **Hemigaleidae** Hasse 1878 (weasel sharks)
- Family **Carcharhinidae** Jordan & Evermann 1896 (requiem sharks)
- Family **Galeocerdonidae** Poey 1875 (tiger sharks)
- Family **Sphyrnidae** Bonaparte 1840 (hammerhead sharks)
- o Order **Squaliformes**
 - Family **Dalatiidae** Gray 1851 (kitefin sharks)
 - Family **Etmopteridae** Fowler 1934 (lantern sharks)
 - Family **Somniosidae** Jordan 1888 (sleeper sharks)
 - Family **Oxynotidae** Gill 1863 (rough sharks)
 - Family **Centrophoridae** Bleeker 1859 (gulper sharks)
 - Family **Squalidae** Blainville 1816 (dogfish sharks)
- o Order **Echinorhiniformes**
 - Family **Echinorhinidae** Gill 1862 (bramble sharks)
- o Order **Pristiophoriformes**
 - Family **Pristiophoridae** Bleeker 1859 (saw sharks)
- o Order **Squatiniiformes**
 - Family **Squatinae** Blainville 1816 (angel sharks)
- o Order **Torpediniformes**
 - Family **Platyrrhinidae** Jordan 1923 (thornbacks or fanrays)
 - Family **Narkidae** Fowler 1934 (sleeper rays)
 - Family **Narcinidae** Gill 1862 (electric rays)
 - Family **Hypnidae** Gill 1862 (coffin rays)
 - Family **Torpedinidae** Henle 1834 (torpedo electric rays or torpedo rays)

o Order **Rhinopristiformes**

- Family **Trygonorrhinidae** Last, Séret & Naylor 2016 (fiddler rays or banjo rays)
- Family **Rhinobatidae** Bonaparte 1835 (guitarfishes)
- Family **Rhinidae** Müller & Henle 1841 (bowmouth guitarfishes or wedgefishes)
- Family **Glaucostegidae** Last, Séret & Naylor 2016 (giant guitarfishes)
- Family **Pristidae** Bonaparte 1835 (sawfishes)

o Order **Rajiformes**

- Family **Rajidae** Blainville 1816 (hardnose skates)
- Family **Arhynchobatidae** Fowler 1934 (softnose skates or longtail skates)
- Family **Gurgesiellidae** de Buen 1959 (pygmy skates)
- Family **Anacanthobatidae** von Bonde & Swart 1923 (legskates or smooth skates)

o Order **Myliobatiformes**

- Family **Zanobatidae** Fowler 1934 (panrays)
- Family **Hexatrygonidae** Heemstra & Smith 1980 (sixgill stingrays)
- Family **Dasyatidae** Jordan & Gilbert 1879 (whiptail stingrays)
 - Subfamily **Dasyatinae** Jordan & Gilbert 1879 (stingrays)
 - Subfamily **Neotrygoninae** Last, Naylor & Manjaji-Matsumoto 2016 (shortsnout stingrays)
 - Subfamily **Urogymninae** Gray 1851 (whiprays)
 - Subfamily **Hypolophinae** Stromer 1910 (cowtail stingrays)
- Family **Potamotrygonidae** Garman 1877 (neotropical stingrays)
 - Subfamily **Styracurinae** Carvalho, Loboda & da Silva 2016 (whiptail stingrays)
 - Subfamily **Potamotrygoninae** Garman 1877 (river stingrays)
- Family **Urotrygonidae** McEachran, Dunn & Miyake 1996 (American round stingrays)
- Family **Gymnuridae** Fowler 1934 (butterfly rays)
- Family **Plesiobatidae** Nishida 1990 (deepwater stingrays or giant stingarees)

- Family **Urolophidae** Müller & Henle 1841 (round stingrays or stingarees)
- Family **Aetobatidae** Agassiz 1858 (pelagic eagle rays)
- Family **Myliobatidae** Bonaparte 1835 (eagle rays)
- Family **Rhinopteridae** Jordan & Evermann 1896 (cownose rays)
- Family **Mobulidae** Gill 1893 (mantas or devil rays)
- Class **Holocephali**
 - Order **Chimaeriformes**
 - Family **Callorhynchidae** Garman 1901 (plownose chimaeras)
 - Family **Chimaeridae** Rafinesque 1815 (shortnose chimaeras or ratfishes)
 - Family **Rhinochimaeridae** Garman 1901 (longnose chimaeras)
- Class **Cladistii**
 - Order **Polypteriformes**
 - Family **Polypteridae** Bonaparte 1835 (bichirs)
- Class **Actinopteri**
 - Order **Acipenseriformes**
 - Family **Acipenseridae** Bonaparte 1831 (sturgeons)
 - Family **Polyodontidae** Bonaparte 1835 (paddlefishes)
 - Order **Amiiformes**
 - Family **Amiidae** Bonaparte 1831 (bowfins)
 - Order **Lepisosteiformes**
 - Family **Lepisosteidae** Agassiz 1832 (gars)
 - Order **Hiodontiformes**
 - Family **Hiodontidae** Valenciennes 1847 (mooneyes)
 - Order **Osteoglossiformes**
 - Family **Pantodontidae** Peters 1876 (freshwater butterfly fishes)
 - Family **Osteoglossidae** Bonaparte 1845 (bonytongues)
 - Family **Arapaimidae** Bonaparte 1846 (arapaimas)
 - Family **Notopteridae** Bleeker 1851 (featherfin knifefishes or featherbacks)

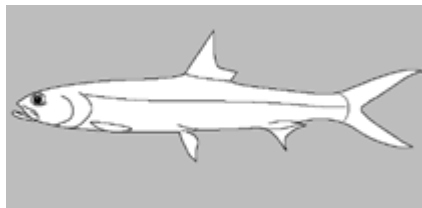
- Subfamily **Notopterinae** Bleeker 1851 (Asiatic featherbacks)
- Subfamily **Xenomystinae** Greenwood 1963 (African knifefishes)
- Family **Mormyridae** Bonaparte 1831 (elephantfishes)
- Family **Gymnarchidae** Bleeker 1859 (abas)

o Order **Elopiformes** – 2 species reported from Indian waters

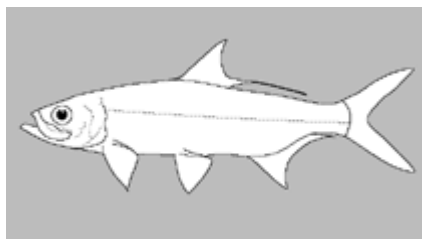


Elopiformes have well-developed gular plates, or extra bones in the throat between the lower jaws, found only in some primitive bony fishes

- Family **Elopidae** Valenciennes 1847 (tenpounders and ladyfishes)



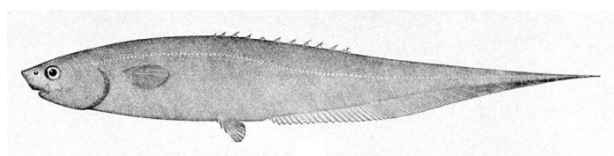
- Family **Megalopidae** Jordan & Gilbert 1883 (tarpons)



o Order **Albuliformes** -1 species from WIO and 2 from EIO; The family is small, with 11 species in 3 genera worldwide

- Family **Albulidae** Bleeker 1849 (bonefishes)

o Order **Notacanthiformes**- 10 species from WIO and 8 from EIO; they are much more eel-like than the albuliforms; the caudal fin is not present



- Family **Halosauridae** Günther 1868 (halosaurs)

- Family **Notacanthidae** Rafinesque 1810 (deepsea spiny eels)



Halosaurus carinicauda (Alcock, 1889)-reported from Arabian Sea

o Order **Anguilliformes**

- Family **Chlopsidae** Rafinesque 1815 (false morays) -5 species from EIO
- Family **Protanguillidae** Johnson, Ida & Miya 2011 (primitive cave eels)
- Family **Synphobranchidae** Johnson 1862 (cutthroat eels)
 - Subfamily **Simenchelyinae** Gill 1879 (pugnose parasitic eels)
 - Subfamily **Ilyophinae** Jordan & Davis 1891 (arrowtooth eels or mustard eels)
 - Subfamily **Synphobranchinae** Johnson 1862 (cutthroat eels)

o Suborder **Anguilloidei**

- Family **Moringuidae** Gill 1885 (spaghetti eels)- 4 species in India – WIO, 2 species in EIO



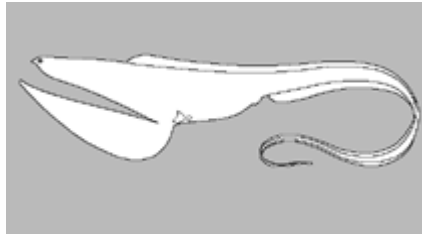
- Family **Anguillidae** Rafinesque 1810 (freshwater eels)- 4 species in India – WIO, 2 species in EIO



- Family **Nemichthyidae** Kaup 1859 (snipe eels or threadtail snipe eels)-1 species in Indian waters



- Family **Serrivomeridae** Trewavas 1932 (sawtooth eels)
- Family **Cyematidae** Regan 1912 (bobtail eels)
- Family **Monognathidae** Trewavas 1937 (onejaw gulpers)
- Family **Neocyematidae** Poulsen, Miller, Sado, Hanel, Tsukamoto & Miya 2018 (orange bobtail eels)
- Family **Eurypharyngidae** Gill 1883 (gulper eels or pelican eels)



- Family **Saccopharyngidae** Bleeker 1859 (swallower eels or whiptail gulpers)



o Suborder **Muraenoidei**

- Family **Heterenchelyidae** Regan 1912 (mud eels)

Gill openings low on body. Origin of dorsal until over gill opening. Lateral line absent.



- Family **Myrocongridae** Gill 1890 (myroconger eels)

Body compressed, moray-like; eye well developed; pectoral fin present; lateral line restricted to a few pores at anterior-most end; posterior nostril level with upper margin of eye

- Family **Muraenidae** Rafinesque 1815 (moray eels) – 30 species in India from WIO



- Subfamily **Uropterygiinae** Fowler 1925 (tailfin moray eels)
- Subfamily **Muraeninae** Rafinesque 1815 (morays)

o Suborder **Congroidei**

- Family **Colocongridae** Smith 1976 (shorttail eels) – 1 species from WIO



- Family **Derichthyidae** Gill 1884 (longneck eels or narrowneck eels)

Head bearing a series of parallel striations that form part of a sensory system. Pectorals present, pelvics absent; dorsal fin origin behind tip of pectorals. Anus well behind midlength. Snout short in *Derichthys* and relatively long in *Nessorhamphus*.

- Family **Ophichthidae** Günther 1870 (snake eels and worm eels) - 15 species in India from WIO



- Subfamily **Myrophinae** Kaup 1856 (worm eels)
- Subfamily **Ophichthinae** Günther 1870 (snake eels)

- Family **Muraenesocidae** Kaup 1859 (pike conger eels)
 - 4 species in India WIO



Pike congers have cylindrical bodies, scaleless skin, narrow heads with large eyes, and strong teeth. Their dorsal fins start above the well-developed pectoral fins. These rather aggressive fish range from 60 to 250 cm

- Family **Nettastomatidae** Kaup 1859 (duckbill eels)

Duckbill eels are found along the continental slopes of tropical and temperate oceans worldwide. They are bottom-dwelling fish, feeding on invertebrates and smaller fish. They are slender eels, up to 125 centimetres (4.10 ft) in length, with narrow heads and large, toothy, mouths. Most species lack pectoral fins.



- Family **Congridae** Kaup 1856 (conger eels)

The Congridae are the family of conger and garden eels. Congers are valuable and often large food fishes, while garden eels live in colonies, all protruding from the sea floor after the manner of plants in a garden (thus the name).^[2] The family includes over 220 species in 32 genera



- Subfamily **Congrinae** Kaup 1856 (congers)
 - Subfamily **Bathymyrinae** Böhlke 1949
 - Subfamily **Heterocongrinae** Günther 1870 (garden eels)
- Order **Clupeiformes**

Includes the herring family, Clupeidae, and the anchovy family, Engraulidae and sardines. The group includes many of the most important forage and food fish.

 - Suborder **Denticipitoidei**
 - Family **Denticipitidae** Clausen 1959 (denticle herrings)
 - Suborder **Clupeoidei**

- Family **Spratelloididae** Jordan 1925 (dwarf herrings or small round herrings)

Spratelloididae is a small family of marine ray-finned fishes which also includes the anchovies and herrings. The taxa in this family were previously classified within the family Clupeidae but are now considered to be a valid family.^[2] One genus, *Jenkinsia* is found in the Western Atlantic, the other, *Spratelloides*, in the Indian and Pacific Oceans

- Family **Engraulidae** Gill 1861 (anchovies)
 - Subfamily **Coiliinae** Bleeker 1872 (Old World anchovies)
 - Subfamily **Engraulinae** Gill 1861 (anchovies)
 - Family **Clupeidae** Cuvier 1816 (herrings and sprats)
 - Family **Chirocentridae** Bleeker 1849 (wolf herrings)
 - Family **Dussumieriidae** Gill 1861 (round herrings or rainbow sardines)
 - Family **Pristigasteridae** Bleeker 1872 (longfin herrings)
 - Family **Ehiravidae** Deraniyagala 1929 (river sprats)
 - Family **Alosidae** Svetovidov 1952 (shads and sardines)
 - Family **Dorosomatidae** Gill 1861 (thread herrings or gizzard shads and sardinellas)
- Order **Alepocephaliformes**
 - Family **Alepocephalidae** Bonaparte 1846 (slickheads)
 - Family **Platytrichtidae** Koefoed 1927 (tubeshoulders)
 - Order **Gonorynchiformes**
 - Family **Chanidae** Günther 1868 (milkfishes)
 - Family **Gonorynchidae** Fowler 1941 (1848) (beaked sandfishes)
 - Family **Kneriidae** Günther 1868 (shellears)
 - Family **Phractolaemidae** Boulenger 1901 (snake mudheads)
 - Order **Cypriniformes**
 - Suborder **Gyrinocheiloidei**
 - Family **Gyrinocheilidae** Gill 1907 (algae eaters)
 - Suborder **Catostomoidei**
 - Family **Catostomidae** Agassiz 1850 (suckers)

- Subfamily **Myxocyprininae** Fowler 1958 (Chinese suckers)
- Subfamily **Cycleptinae** Gill 1861 (blue suckers)
- Subfamily **Ictiobinae** Bleeker 1863 (carpsuckers and buffalos)
- Subfamily **Catostominae** Agassiz 1850 (suckers)
- o Suborder **Cobitoidei**
 - Family **Botiidae** Berg 1940 (pointface loaches)
 - Subfamily **Leptobotiinae** Nalbant 2002 (Chinese pointface loaches)
 - Subfamily **Botiinae** Berg 1940 (beautiful loaches)
 - Family **Vaillantellidae** Nalbant & Bănărescu 1977 (longfin loaches)
 - Family **Cobitidae** Swainson 1838 (spined loaches)
 - Family **Barbuccidae** Kottelat 2012 (scooter loaches)
 - Family **Gastromyzontidae** Fowler 1905 (hillstream loaches)
 - Family **Serpenticobitidae** Kottelat 2012 (snake loaches)
 - Family **Balitoridae** Swainson 1839 (river loaches)
 - Family **Ellopostomatidae** Bohlen & Šlechtová 2009 (square-head loaches)
 - Family **Nemacheilidae** Regan 1911 (brook loaches)
- o Suborder **Cyprinoidei**
 - Family **Paedocyprididae** Mayden & Chen 2010 (tiny carps)
 - Family **Psilorhynchidae** Hora 1926 (mountain carps)
 - Family **Cyprinidae** Rafinesque 1815 (carps)
 - Subfamily **Labeoninae** Bleeker 1859 (labeonines)
 - Subfamily **Probarbinae** Yang et al. 2015 (primitive cyprinids)
 - Subfamily **Torinae** Karaman 1971 (large barbs)
 - Subfamily **Smiliogastrinae** Bleeker 1863 (small barbs)
 - Subfamily **Cyprininae** Rafinesque 1815 (carps)
 - Subfamily **Acrossocheilinae** Yang et al. 2015 (East Asian barbs)
 - Subfamily **Barbinae** Bleeker 1859 (barbels)
 - Subfamily **Spinibarbinae** Yang et al. 2015 (spine barbs)

- Subfamily **Schizothoracinae** McClelland 1842 (snow barbels)
- Subfamily **Schizopygopsinae** Mirza 1991 (mountain barbels)
- Family **Sundadanionidae** Mayden & Chen 2010 (tiny danios)
- Family **Danionidae** Bleeker 1863 (danionids)
 - Subfamily **Chedrinae** Bleeker 1863 (troutbarbs)
 - Subfamily **Rasborinae** Günther 1868 (rasborines)
 - Subfamily **Danioninae** Bleeker 1863 (danionines)
 - Subfamily **Esominae** Tan & Armbruster 2018 (flying barbels)
- Family **Leptobarbidae** Bleeker 1864 (cigar barbels)
- Family **Xenocyprididae** Günther 1868 (East Asian minnows or sharpbellies)
- Family **Tincidae** Jordan 1878 (tenches)
- Family **Acheilognathidae** Bleeker 1863 (bitterlings)
- Family **Gobionidae** Bleeker 1863 (freshwater gudgeons)
- Family **Tanichthyidae** Mayden & Chen 2010 (mountain minnows)
- Family **Leuciscidae** Bonaparte 1835 (minnows)
 - Subfamily **Pseudaspinae** Bogutskaya 1990 (Far East Asian leuciscines)
 - Subfamily **Laviniinae** Bleeker 1863 (western chubs)
 - Subfamily **Plagopterinae** Cope 1874 (creek chubs)
 - Subfamily **Leuciscinae** Bonaparte 1835 (leuciscines)
 - Subfamily **Phoxininae** Bleeker 1863 (phoxinines)
 - Subfamily **Pogonichthyinae** Girard 1858 (minnows & shiners)
- Order **Gymnotiformes**
 - o Family **Apteronotidae** Jordan 1923 (ghost knifefishes)
 - Subfamily **Sternarchorhamphinae** Albert 2001 (longsnout knifefishes)
 - Subfamily **Apteronotinae** Jordan 1923 (ghost knifefishes)
 - o Family **Sternopygidae** Cope 1871 (glass knifefishes)
 - Subfamily **Sternopyginae** Cope 1871 (rattail knifefishes)
 - Subfamily **Eigenmanniinae** Mago-Leccia 1978 (glass knifefishes)

- o Family **Gymnotidae** Rafinesque 1815 (gymnotid eels)
 - Subfamily **Electrophorinae** Gill 1872 (electric eels)
 - Subfamily **Gymnotinae** Rafinesque 1815 (nakedback knifefishes)
- o Family **Hypopomidae** Eigenmann 1912 (bluntnose knifefishes)
- o Family **Rhamphichthyidae** Regan 1911 (painted knifefishes)
- Order **Characiformes**
 - o Suborder **Citharinoidei**
 - Family **Citharinidae** Günther 1864 (citharinids)
 - Family **Distichodontidae** Günther 1864 (distichodontids)
 - o Suborder **Characoidei**
 - Family **Crenuchidae** Günther 1864 (crenuchids)
 - Subfamily **Crenuchinae** Günther 1864 (sailfin tetras)
 - Subfamily **Characidiinae** Fowler 1932 (South American darters)
 - Family **Alestidae** Cockerell 1910 (African tetras)
 - Family **Lepidarchidae** Melo & Stiassny 2024
 - Family **Hepsetidae** Hubbs 1939 (African pikes)
 - Family **Tarumaniidae** de Pinna, Zuanon, Rapp Py-Daniel & Petry 2017 (muckfishes)
 - Family **Erythrinidae** Valenciennes 1847 (trahiras)
 - Family **Parodontidae** Eigenmann 1910 (darter tetras)
 - Family **Cynodontidae** Eigenmann 1903 (sabertoothed characids)
 - Family **Serrasalminidae** Bleeker 1859 (piranhas and allies)
 - Subfamily **Colossomatinae** Kolmann et al. 2021 (lowland pacus)
 - Subfamily **Myleinae** Eigenmann 1903 (upland pacus)
 - Subfamily **Serrasalminae** Bleeker 1859 (piranhas)
 - Family **Hemiodontidae** Bleeker 1859 (hemiodontids)
 - Family **Anostomidae** Günther 1864 (toothed headstanders)
 - Family **Chilodontidae** Eigenmann 1903 (headstanders)
 - Family **Curimatidae** Gill 1858 (toothless characiforms)

- Family **Prochilodontidae** Eigenmann 1909 (bocachicos)
- Family **Lebiasinidae** Gill 1889 (lebiasinids)
 - Subfamily **Lebiasininae** Gill 1889 (lebiasinas)
 - Subfamily **Pyrrhulininae** Bleeker 1859 (splashing tetras and pencilfishes)
- Family **Ctenoluciidae** Schultz 1944 (pike characids)
- Family **Chalceidae** Fowler 1958 (tucanfishes)
- Family **Triporthidae** Fowler 1940 (hatchet characins)
 - Subfamily **Triporthinae** Fowler 1940 (keeled characines)
 - Subfamily **Agoniatinae** Bleeker 1859 (anchovy characines)
 - Subfamily **Clupeacharacinae** Fowler 1958 (herring characines)
- Family **Gasteropelecidae** Bleeker 1859 (freshwater hatchetfishes)
- Family **Bryconidae** Eigenmann 1912 (bryconids)
 - Subfamily **Bryconinae** Eigenmann 1912 (bryconines)
 - Subfamily **Salmininae** Cockerell 1915 (dorados)
- Family **Iguanodectidae** Eigenmann 1909 (iguanodectids)
- Family **Acestrorhynchidae** Eigenmann 1912 (freshwater barracudas and biting tetras)
 - Subfamily **Acestrorhynchinae** Eigenmann 1912 (freshwater barracudas)
 - Subfamily **Roestinae** Lucena & Menezes 1998 (biting tetras)
 - Subfamily **Heterocharacinae** Géry 1966 (small biting tetras)
- Family **Spintherobolidae** Mirande 2019 (piquiras)
- Family **Stevardiidae** Gill 1858 (stevardiids)
 - Subfamily **Landoninae** Weitzman & Menezes 1998 (caudal sac characins)
 - Subfamily **Xenrobryconinae** Myers & Böhlke 1956 (xenrobryconines)
 - Subfamily **Glandulocaudinae** Eigenmann 1914 (chirping tetras)
 - Subfamily **Argopleurinae** Melo & Oliveira 2024 (Andean tetras)

- Subfamily **Hemibryconinae** Géry 1966 (hemibryconines)
- Subfamily **Stevardiinae** Gill 1858 (stevardiines)
- Subfamily **Planaltinae** Oliveira & Souza 2024 (Brazilian Shield tetras)
- Subfamily **Creagrutinae** Miles 1943 (creagrutines)
- Subfamily **Diapominae** Eigenmann 1909
- Family **Characidae** Latreille 1825 (characids)
 - Subfamily **Aphyocharacinae** Eigenmann 1909 (glass characins)
 - Subfamily **Cheirodontinae** Eigenmann 1915 (cheirodontines)
 - Subfamily **Exodontinae** Fowler 1958 (lepidophagous characins)
 - Subfamily **Tetragonopterinae** Gill 1858
 - Subfamily **Characinae** Latreille 1825 (characines)
- Family **Acestrorhamphidae** Eigenmann 1907 (American tetras)
 - Subfamily **Oxybryconinae** Melo, Mattox & Oliveira 2024
 - Subfamily **Trochilocharacinae** Zarske 2010 (hummingbird characins)
 - Subfamily **Stygichthyinae** Géry 1972
 - Subfamily **Megalamphodinae** Carvalho, Lima & Melo 2024 (red tetras)
 - Subfamily **Stichonodontinae** Eigenmann 1910
 - Subfamily **Stethaprioninae** Eigenmann 1907 (discus tetras)
 - Subfamily **Pristellinae** Géry & Boutière 1964
 - Subfamily **Jupiabinae** Benine & Ota 2024
 - Subfamily **Tyttobryconinae** Mattox & Melo 2024
 - Subfamily **Hyphessobryconinae** Lima, Carvalho & Faria 2024 (multicusp characins)
 - Subfamily **Thayeriinae** Ota, Reia & Benine 2024
 - Subfamily **Rhoadsiinae** Fowler 1911 (Pacific characins)
 - Subfamily **Grundulinae** Fowler 1958
 - Subfamily **Acestrorhamphinae** Eigenmann 1907

- Family **Characids incertae sedis**
- Order **Siluriformes**
 - Suborder **Diplomystoidei**
 - Family **Diplomystidae** Eigenmann 1890 (diplomystid catfishes)
 - Suborder **Cetopsoidei**
 - Family **Cetopsidae** Bleeker 1858 (cetopsid catfishes)
 - Subfamily **Cetopsinae** Bleeker 1858 (whalelike catfishes)
 - Subfamily **Helogeninae** Regan 1911 (marbled catfishes)
 - Suborder **Loricarioidei**
 - Family **Nematogenyidae** Bleeker 1862 (mountain catfishes)
 - Family **Trichomycteridae** Bleeker 1858 (pencil catfishes)
 - Subfamily **Copionodontinae** de Pinna 1992 (Chapada pencil catfishes)
 - Subfamily **Trichogeninae** Isbrücker 1986 (longfin pencil catfishes)
 - Subfamily **Trichomycterinae** Bleeker 1858 (pencil catfishes)
 - Subfamily **Microcambevinae** Costa, Henschel & Katz 2020 (Atlantic Forest trichomycterids)
 - Subfamily **Glanapteryginae** Myers 1944 (miniature pencil catfishes)
 - Subfamily **Sarcoglanidinae** Myers & Weitzman 1966 (psammophilic catfishes)
 - Subfamily **Tridentinae** Eigenmann 1918 (tiny pencil catfishes)
 - Subfamily **Stegophilinae** Günther 1864 (parasitic catfishes)
 - Subfamily **Vandelliinae** Bleeker 1862 (hematophagous catfishes)
 - Family **Callichthyidae** Bonaparte 1835 (callichthyid armored catfishes)
 - Subfamily **Callichthyinae** Bonaparte 1835 (callichthyines)
 - Subfamily **Corydoradinae** Hoedeman 1952 (corys)
 - Family **Loricariidae** Rafinesque 1815 (suckermouth armored catfishes)
 - Subfamily **Lithogeninae** Gosline 1947 (climbing armored catfishes)

- Subfamily **Delturinae** Reis, Pereira & Armbruster 2006 (primitive suckermouth catfishes)
 - Subfamily **Rhinelepinae** Armbruster 2004 (rhinelepine plecos)
 - Subfamily **Loricariinae** Rafinesque 1815 (mailed catfishes)
 - Subfamily **Hypoptopomatinae** Eigenmann & Eigenmann 1890 (cascudinhos)
 - Subfamily **Hypostominae** Kner 1853 (suckermouth catfishes)
 - Family **Scoloplacidae** Bailey & Baskin 1976 (spiny dwarf catfishes)
 - Family **Astroblepidae** Bleeker 1862 (climbing catfishes)
- o Suborder **Siluroidei**
- Family **Chacidae** Bleeker 1858 (squarehead or angler catfishes)
 - Family **Plotosidae** Bleeker 1858 (eeltail catfishes)
 - Family **Ritidae** Bleeker 1862 (velvet catfishes)
 - Family **Ailiidae** Bleeker 1858 (Asian schilbeids)
 - Family **Horabagridae** Jayaram 2006 (imperial catfishes)
 - Family **Bagridae** Bleeker 1858 (bagrid catfishes)
 - Family **Akysidae** Gill 1861 (stream catfishes)
 - Subfamily **Akysinae** Gill 1861 (wasp catfishes)
 - Subfamily **Parakysinae** Roberts 1989 (warty catfishes)
 - Family **Amblycipitidae** Day 1873 (torrent catfishes)
 - Family **Sisoridae** Bleeker 1858 (sisorid catfishes)
 - Subfamily **Sisorinae** Bleeker 1858 (Asian stream catfishes)
 - Subfamily **Glyptosterninae** Gill 1861 (Asian sucker catfishes)
 - Family **Pangasiidae** Bleeker 1858 (pangasid catfishes)
 - Family **Siluridae** Rafinesque 1815 (sheatfishes)
 - Family **Kryptoglanidae** Britz, Kakkassery & Raghavan 2014 (Indian cave catfishes)
 - Family **Aspredinidae** Adams 1854 (banjo catfishes)
 - Subfamily **Pseudobunocephalinae** Carvalho, Arce H., Reis & Sabaj 2018 (terminal-mouth banjo catfishes)
 - Subfamily **Hoplomyzontinae** Fernández-Yépez 1950 (small banjo catfishes)

- Subfamily **Aspredininae** Adams 1854 (banjo cats)
- Family **Auchenipteridae** Bleeker 1862 (intromittant catfishes)
 - Subfamily **Centromochlinae** Bleeker 1862 (dimorphic intromittant catfishes)
 - Subfamily **Auchenipterinae** Bleeker 1862 (driftwood catfishes)
- Family **Doradidae** Bleeker 1858 (thorny catfishes)
 - Subfamily **Acanthodoradinae** Sabaj & Mariangeles 2021
 - Subfamily **Astrodoradinae** Higuchi, Birindelli, Sousa & Britski 2007 (spotted thorny cats)
 - Subfamily **Wertheimerinae** Birindelli 2014 (Eastern Brazil thorny cats)
 - Subfamily **Agamyxinae** Sabaj & Mariangeles 2021
 - Subfamily **Rhinodoradinae** Sabaj & Mariangeles 2021
 - Subfamily **Doradinae** Bleeker 1858 (fimbriate-barbel thorny cats)
- Family **Heptapteridae** Gill 1861 (seven-finned catfishes)
 - Subfamily **Rhamdiinae** Bleeker 1862 (whiskered catfishes)
 - Subfamily **Heptapterinae** Gill 1861 (slender whiskered catfishes)
- Family **Phreatobiidae** Reichel 1927 (cistern catfishes)
- Family **Pimelodidae** Bonaparte 1835 (long-whiskered catfishes)
- Family **Pseudopimelodidae** Fernández-Yépez & Antón 1966 (bumblebee catfishes)
 - Subfamily **Pseudopimelodinae** Fernández-Yépez & Antón 1966
 - Subfamily **Batrochoglaninae** Shibatta & Silva 2021 (frog catfishes)
- Family **Clariidae** Bonaparte 1845 (airbreathing or labyrinth catfishes)
- Family **Heteropneustidae** Hora 1936 (airsac catfishes)
- Family **Ariidae** Bleeker 1858 (sea catfishes)
 - Subfamily **Galeichthyinae** Acero & Betancur-R. 2007 (bearded sea catfishes)
 - Subfamily **Ariinae** Bleeker 1858

- Subfamily **Bagreinae** Schultz 1944 (whiskered sea catfishes)
- Family **Anchariidae** Glaw & Vences 1994 (Malagasy catfishes)
- Family **Austroglanididae** Mo 1991 (rock catlets)
- Family **Cranoglanididae** Myers 1931 (armorhead catfishes)
- Family **Ictaluridae** Gill 1861 (North American freshwater catfishes)
- Family **Lacantuniidae** Rodiles-Hernández, Hendrickson & Lundberg 2005 (Lacantún catfishes or Chiapas catfishes)
- Family **Amphiliidae** Regan 1911 (loach catfishes)
 - Subfamily **Amphiliinae** Regan 1911 (amphiliine catfishes)
 - Subfamily **Leptoglaninae** Roberts 2003 (sand catlets)
 - Subfamily **Doumeinae** Regan 1911 (doumeine catfishes)
- Family **Malapteruridae** Bleeker 1858 (electric catfishes)
- Family **Mochokidae** Regan 1912 (squeakers and upside-down catfishes)
 - Subfamily **Chiloglanidinae** Vigliotta 2008 (African suckermouths)
 - Subfamily **Mochokinae** Regan 1912 (squeakers)
- Family **Auchenoglanididae** Jayaram 1966 (flatnose catfishes)
- Family **Claroteidae** Bleeker 1862 (grunter catfishes)
- Family **Schilbeidae** Bleeker 1858 (schilbeid catfishes)
- Order **Lepidogalaxiiformes**
 - Family **Lepidogalaxiidae** Rosen 1974 (salamanderfishes)
- Order **Argentiniformes**
 - Family **Argentinidae** Bonaparte 1846 (argentines)
 - Family **Opisthoproctidae** Schmidt 1918 (spookfishes or barreleyes)
 - Family **Microstomatidae** Bleeker 1859 (pencilsmelts)
 - Family **Bathylagidae** Gill 1884 (deepsea smelts)
- Order **Salmoniformes**
 - Suborder **Salmonoidei**
 - Family **Salmonidae** Cuvier 1816 (salmonids)
 - Subfamily **Coregoninae** Bonaparte 1845 (whitefishes)

- Subfamily **Thymallinae** Gill 1885 (graylings)
 - Subfamily **Salmoninae** Cuvier 1816 (salmons, trouts, chars and allies)
- o Suborder **Esocoidei**
 - Family **Esocidae** Rafinesque 1815 (pikes)
 - Subfamily **Dalliinae** Jordan 1885 (blackfishes)
 - Subfamily **Esocinae** Rafinesque 1815 (pikes)
 - Family **Umbridae** Bonaparte 1845 (mudminnows)
- Order **Galaxiiformes**
 - o Family **Galaxiidae** Müller 1845 (galaxiids)
 - Subfamily **Aplocheilichthyinae** Günther 1864 (peladillas)
 - Subfamily **Galaxiinae** Müller 1845 (white bait and mudfishes)
- Order **Osmeriformes**
 - o Suborder **Retropinnoidae**
 - Family **Retropinnidae** Gill 1862 (New Zealand smelts)
 - Subfamily **Retropinninae** Gill 1862 (southern smelts)
 - Subfamily **Prototroctinae** Hubbs 1952 (southern graylings)
 - o Suborder **Osmeroidei**
 - Family **Osmeridae** Regan 1913 (smelts)
 - Family **Plecoglossidae** Bleeker 1859 (ayu fishes)
 - Family **Salangidae** Bleeker 1859 (icefishes or noodlefishes)
- Order **Stomiiformes**
 - o Family **Gonostomatidae** Cocco 1838 (bristlemouths)
 - o Family **Sternoptychidae** Duméril 1805 (marine hatchetfishes)
 - Subfamily **Maurolicinae** Gill 1885
 - Subfamily **Sternoptychinae** Duméril 1805 (marine hatchetfishes)
 - o Family **Stomiidae** Bleeker 1859 (dragonfishes or barbeled dragonfishes)
 - Subfamily **Chauliodontinae** Bonaparte 1845 (viperfishes)
 - Subfamily **Stomiinae** Bleeker 1859 (scaly dragonfishes and lightfishes)
 - Subfamily **Astronesthinae** Günther 1864 (snaggleteeths)

- Subfamily **Melanostomiinae** Parr 1927 (scaleless black dragonfishes)
- Subfamily **Malacosteinae** Gill 1890 (loosejaws)
- Subfamily **Idiacanthinae** Gill 1893 (black dragonfishes)
- Order **Ateleopodiformes**
 - Family **Ateleopodidae** Bonaparte 1850 (jellynose fishes)
- Order **Aulopiformes**
 - Family **Aulopidae** Bonaparte 1831 (flagfins)
 - Family **Chlorophthalmidae** Garman 1899 (greeneyes)
 - Family **Paraulopidae** Sato & Nakabo 2002 (cucumber fishes)
 - Family **Ipnopidae** Gill 1884 (deepsea tripodfishes)
 - Family **Bathysauroididae** Sato & Nakabo 2002 (largescale deepsea lizardfishes)
 - Family **Scopelarchidae** Alcock 1896 (pearleyes)
 - Family **Notosudidae** Parr 1928 (paperbones or waryfishes)
 - Family **Giganturidae** Brauer 1906 (telescopefishes)
 - Family **Synodontidae** Gill 1861 (lizardfishes)
 - Subfamily **Synodontinae** Gill 1861 (lizardfishes)
 - Subfamily **Harpadontinae** Bleeker 1875 (Bombay ducks)
 - Family **Bathysauridae** Fowler 1944 (deepsea lizardfishes)
 - Family **Paralepididae** Bonaparte 1835 (barracudinas)
 - Family **Anopteridae** Zugmayer 1911 (daggertoosths)
 - Family **Evermannellidae** Fowler 1901 (sabertooth fishes)
 - Family **Omosudidae** Regan 1911 (hammerjaws)
 - Family **Alepisauridae** Swainson 1839 (lancetfishes)
 - Family **Pseudotrichonotidae** Yoshino & Araga 1975 (sand-diving lizardfishes)
- Order **Myctophiformes**
 - Family **Neoscopelidae** Jordan 1901 (blackchins)
 - Family **Myctophidae** Gill 1893 (lanternfishes)
 - Subfamily **Gymnoscopelinae** Paxton 1972 (luminous lanternfishes)
 - Subfamily **Notolychninae** Paxton 1972 (topside lanternfishes)

- Subfamily **Lampanyctinae** Paxton 1972 (toothy lampfishes)
- Subfamily **Diaphinae** Paxton 1972 (headlightfishes)
- Subfamily **Myctophinae** Gill 1893 (lanternfishes)
- Order **Lampriformes**
 - Family **Lampridae** Gill 1862 (opahs)
 - Family **Veliferidae** Bleeker 1859 (velifers)
 - Family **Lophotidae** Bonaparte 1845 (crestfishes)
 - Family **Radiicephalidae** Osório 1917 (tapertails)
 - Family **Trachipteridae** Swainson 1839 (ribbonfishes or dealfishes)
 - Family **Regalecidae** Gill 1884 (oarfishes)
- Order **Polymixiiformes**
 - Family **Polymixiidae** Bleeker 1859 (beardfishes)
- Order **Percopsiformes**
 - Family **Percopsidae** Agassiz 1850 (trout-perches)
 - Family **Aphredoderidae** Bonaparte 1845 (pirate perches)
 - Family **Amblyopsidae** Bonaparte 1845 (cavefishes)
- Order **Zeiformes**
 - Family **Zeidae** Rafinesque 1815 (dories)
 - Family **Cyttidae** Günther 1860 (lookdown dories)
 - Family **Oreosomatidae** Bleeker 1859 (oreos)
 - Subfamily **Pseudocyttinae** Tyler, O'Toole & Winterbottom 2003
 - Subfamily **Oreosomatinae** Bleeker 1859
 - Family **Parazenidae** McAllister 1968 (smooth dories)
 - Subfamily **Parazeninae** McAllister 1968
 - Subfamily **Cyttopsinae** no valid family-group name description
 - Family **Zeniontidae** Myers 1960 (dwarf dories or armoreye dories)
 - Family **Grammicolepididae** Poey 1873 (tinselfishes)
 - Subfamily **Macrurocyttinae** Myers 1960
 - Subfamily **Grammicolepidinae** Poey 1873

- Order **Gadiformes**
 - Suborder **Stylephoroidei**
 - Family **Stylephoridae** Swainson 1839 (tube-eyes or threadtails)
 - Suborder **Bregmacerotoidei**
 - Family **Bregmacerotidae** Gill 1872 (codlets)
 - Suborder **Gadoidei**
 - Family **Phycidae** Swainson 1838 (phycid hakes)
 - Family **Gaidropsaridae** Jordan & Evermann 1898 (rocklings)
 - Family **Lotidae** Bonaparte 1835 (hakes and burbot)
 - Family **Gadidae** Rafinesque 1810 (cods and haddocks)
 - Suborder **Ranicipitoidei**
 - Family **Ranicipitidae** Bonaparte 1835 (tadpole fishes)
 - Suborder **Merluccioidei**
 - Family **Merlucciidae** Rafinesque 1815 (merlucciid hakes)
 - Suborder **Macrouroidei**
 - Family **Euclichthyidae** Cohen 1984 (Eucla cods)
 - Family **Muraenolepididae** Regan 1903 (eel cods)
 - Family **Melanonidae** Goode & Bean 1896 (arrowtails or pelagic cods)
 - Family **Trachyrincidae** Goode & Bean 1896 (armoured grenadiers)
 - Family **Moridae** Moreau 1881 (codlings or deepsea cods)
 - Family **Macruronidae** Regan 1903 (blue grenadiers)
 - Family **Lyconidae** Günther 1887 (Atlantic hakes)
 - Family **Bathygadidae** Jordan & Evermann 1898 (rattails)
 - Family **Steindachneriidae** Parr 1942 (luminous hakes)
 - Family **Macrouridae** Bonaparte 1831 (grenadiers or rattails)
- Order **Trachichthyiformes**
 - Family **Diretmidae** Gill 1893 (spinyfins)
 - Family **Monocentridae** Gill 1859 (pinecone fishes)
 - Family **Anomalopidae** Gill 1889 (flashlightfishes or lanterneye fishes)
 - Family **Trachichthyidae** Bleeker 1856 (roughies or slimeheads)

- o Family **Anoplogastridae** Gill 1893 (fangtooths)
- Order **Beryciformes**
 - o Suborder **Holocentroidei**
 - Family **Holocentridae** Bonaparte 1833 (squirrelfishes and soldierfishes)
 - Subfamily **Holocentrinae** Bonaparte 1833 (squirrelfishes)
 - Subfamily **Myripristinae** Nelson 1955 (soldierfishes)
 - o Suborder **Berycoidei**
 - Family **Berycidae** Lowe 1839 (berycids or alfonsoinos)
 - Family **Melamphaidae** Gill 1893 (big scales)
 - o Suborder **Stephanoberycoidei**
 - Family **Stephanoberycidae** Gill 1884 (pricklefishes)
 - Family **Hispidoberycidae** Kotlyar 1981 (spiny-scale pricklefishes)
 - Family **Gibberichthyidae** Parr 1933 (gibberfishes)
 - Family **Rondeletiidae** Goode & Bean 1895 (redmouth whalefishes)
 - Family **Barbourisiidae** Parr 1945 (red velvet whalefishes)
 - Family **Cetomimidae** Goode & Bean 1895 (whalefishes or flabby whalefishes)
- Order **Ophidiiformes**
 - o Family **Acanthonidae** Wong & Chen 2024 (deepsea cusk-eels)
 - o Family **Brotulidae** Swainson 1838 (bearded cusk-eels)
 - o Family **Ophidiidae** Rafinesque 1810 (cusk-eels)
 - Subfamily **Brotulotaeniinae** Cohen & Nielsen 1978 (prickle cusk-eels)
 - Subfamily **Ophidiinae** Rafinesque 1810 (true cusk-eels)
 - Subfamily **Neobythitinae** Radcliffe 1913
 - o Family **Carapidae** Poey 1867 (pearlfishes)
 - Subfamily **Carapinae** Poey 1867 (fierasfers)
 - Subfamily **Pyramodontinae** Smith 1955 (pyramodontines)
 - Subfamily **Tetracodacninae** Anderson & Satria 2007 (square-mouthed pearlfishes)
 - Subfamily **Hypopleuroninae** Prokofiev 2004 (whiptail pearlfishes)

- o Family **Bythitidae** Gill 1861 (viviparous brotulas)
- o Family **Dinematichthyidae** Whitley 1928 (dwarf brotulas)
- Order **Batrachoidiformes**
 - o Family **Batrachoididae** Jordan 1896 (toadfishes)
 - Subfamily **Porichthyinae** Miranda Ribeiro 1915
 - Subfamily **Thalassophryninae** Miranda Ribeiro 1915 (venomous toadfishes)
 - Subfamily **Batrachoidinae** Jordan 1896
 - Subfamily **Halophryninae** Greenfield, Winterbottom & Collette 2008 (Old World threespine toadfishes)
- Order **Gobiiformes**
 - o Suborder **Apogonoidei**
 - Family **Kurtidae** Bleeker 1859 (nurseryfishes)
 - Family **Apogonidae** Günther 1859 (cardinalfishes)
 - Subfamily **Apogoninae** Günther 1859
 - Subfamily **Pseudamiinae** Smith 1954
 - Subfamily **Amioidinae** Fraser & Mabuchi 2014
 - Subfamily **Paxtoninae** Fraser & Mabuchi 2014
 - o Suborder **Trichonotoidei**
 - Family **Trichonotidae** Günther 1861 (sand divers)
 - o Suborder **Gobioidei**
 - Family **Rhyacichthyidae** Jordan 1905 (loach gobies)
 - Family **Odontobutidae** Hoese & Gill 1993 (Asian freshwater sleepers)
 - Family **Eleotridae** Bonaparte 1835 (sleepers)
 - Subfamily **Butinae** Bleeker 1874 (gudgeons)
 - Subfamily **Eleotrinae** Bonaparte 1835 (spinycheek sleepers or bullies)
 - Subfamily **Milyeringinae** Whitley 1945 (cave gudgeons)
 - Family **Xenisthmidae** Miller 1973 (collared wrigglers)
 - Family **Oxudercidae** Günther 1861 (mudskippers and allies)
 - Subfamily **Oxudercinae** Günther 1861 (mudskippers)

- Subfamily **Amblyopinae** Günther 1861 (mudburrowing gobies)
 - Subfamily **Gobionellinae** Bleeker 1874 (estuarine gobies)
 - Subfamily **Sicydiinae** Gill 1860 (rock-climbing gobies)
 - Family **Gobiidae** Cuvier 1816 (gobies)
 - Subfamily **Kraemeriinae** Whitley 1935 (1911) (sand darts)
 - Subfamily **Ptereleotrinae** Bleeker 1875 (dart-gobies)
 - Subfamily **Gobiinae** Cuvier 1816 (sea gobies)
 - Subfamily **Microdesminae** Regan 1912 (wormfishes)
 - Family **Thalasseleotrididae** Gill & Mooi 2012 (ocean sleepers)
- Order **Syngnathiformes**
 - Suborder **Dactylopteroidei**
 - Family **Pegasidae** Bonaparte 1831 (seamoths)
 - Family **Dactylopteridae** Gill 1861 (helmet gurnards or flying gurnards)
 - Suborder **Mulloidei**
 - Family **Mullidae** Rafinesque 1815 (goatfishes)
 - Suborder **Callionymoidei**
 - Family **Callionymidae** Bonaparte 1831 (dragonets)
 - Family **Draconettidae** Jordan & Fowler 1903 (slope dragonets)
 - Suborder **Syngnathoidei**
 - Family **Aulostomidae** Rafinesque 1815 (trumpetfishes)
 - Family **Fistulariidae** Stark 1828 (cornetfishes)
 - Family **Centriscidae** Bonaparte 1831 (snipefishes or shrimpfishes)
 - Subfamily **Macroramphosinae** Bleeker 1879 (snipefishes)
 - Subfamily **Centriscinae** Bonaparte 1831 (shrimpfishes)
 - Family **Solenostomidae** Nardo 1843 (ghost pipefishes)
 - Family **Syngnathidae** Bonaparte 1831 (pipefishes and seahorses)
 - Subfamily **Nerophinae** Kaup 1853 (trunk-brooding pipefishes)
 - Subfamily **Syngnathinae** Bonaparte 1831 (tail-brooding pipefishes)

- Order **Scombriformes**

- Suborder **Stromateoidei**

- Family **Amarsipidae** Haedrich 1969 (bagless glassfishes or amarsipas)
- Family **Centrolophidae** Bonaparte 1846 (medusafishes)
- Family **Nomeidae** Günther 1860 (driftfishes)
- Family **Tetragonuridae** Risso 1827 (squaretails)
- Family **Ariommatidae** Haedrich 1967 (ariommas or ariommatids)
- Family **Stromateidae** Rafinesque 1810 (butterfishes)

- Suborder **Scombroidei**

- Family **Pomatomidae** Gill 1863 (bluefishes)
- Family **Icosteidae** Jordan & Gilbert 1880 (ragfishes)
- Family **Arripidae** Gill 1893 (Australian salmon)
- Family **Chiasmodontidae** Jordan & Gilbert 1883 (swallowers)
- Family **Scombridae** Rafinesque 1815 (mackerels, tunas and bonitos)
 - Subfamily **Gasterochismatinae** Poey 1869 (kingfishes)
 - Subfamily **Scombrinae** Rafinesque 1815 (mackerels)
- Family **Caristiidae** Gill & Smith 1905 (manefishes)
- Family **Bramidae** Bonaparte 1831 (pomfrets)
- Family **Scombrolabracidae** Fowler 1925 (longfin escolar or black mackerels)
- Family **Gempylidae** Gill 1862 (snake mackerels)
- Family **Trichiuridae** Rafinesque 1810 (cutlassfishes)
 - Subfamily **Aphanopodinae** Gill 1863 (frostfishes)
 - Subfamily **Lepidopodinae** Gill 1863 (scabbardfishes)
 - Subfamily **Trichiurinae** Rafinesque 1810 (hairtails)

- Order **Synbranchiformes**

- Suborder **Mastacembeloidei**

- Family **Mastacembelidae** Swainson 1839 (freshwater spiny-eels)
- Family **Chaudhuriidae** Annandale 1918 (earthworm eels)

- Suborder **Indostomoidei**

- Family **Indostomidae** Prashad & Mukerji 1929 (armored sticklebacks)

- o Suborder **Synbranchioidei**
 - Family **Synbranchidae** Bonaparte 1835 (swamp eels)
- Order **Anabantiformes**
 - o Suborder **Anabantoidei**
 - Family **Anabantidae** Bonaparte 1831 (climbing gouramies)
 - Family **Helostomatidae** Gill 1872 (kissing gouramies)
 - Family **Osphronemidae** van der Hoeven 1832 (gouramies)
 - Subfamily **Belontiinae** Liem 1962 (combtail gouramies)
 - Subfamily **Osphroneminae** van der Hoeven 1832 (giant gouramies)
 - Subfamily **Luciocephalinae** Bleeker 1852 (spiral egg gouramies)
 - Subfamily **Trichogastrinae** Bleeker 1879 (threadfishes)
 - Subfamily **Macropodusinae** Hoedeman 1948 (paradise fishes and fighting fishes)
 - o Suborder **Channoidei**
 - Family **Aenigmachannidae** Britz, Dahanukar, Anoop, Philip, Clark, Raghavan & Rüber 2020 (Gollum snakehead fishes)
 - Family **Channidae** Fowler 1934 (1831) (snakeheads)
 - o Suborder **Nandoidei**
 - Family **Nandidae** Bleeker 1852 (Asian leaf-fishes)
 - Family **Badidae** Barlow, Liem & Wickler 1968 (chameleon fishes)
 - Family **Pristolepididae** Regan 1913 (mudperches)
- Order **Carangiformes**
 - o Suborder **Centropomoidei**
 - Family **Latidae** Jordan 1888 (giant perches)
 - Family **Centropomidae** Poey 1967 (snooks)
 - Family **Lactariidae** Boulenger 1904 (false trevallies)
 - Family **Sphyraenidae** Rafinesque 1815 (barracudas)
 - o Suborder **Pleuronectoidei**
 - Family **Polynemidae** Rafinesque 1815 (threadfins or tassel-fishes)
 - Family **Psettodidae** Regan 1910 (spiny turbot)

- Family **Citharidae** de Buen 1935 (largescale flounders)
- Family **Scophthalmidae** Chabanaud 1933 (turbots)
- Family **Cyclopsettidae** Campbell et al. 2019 (sand whiffs or large-tooth flounders)
- Family **Bothidae** Smitt 1892 (lefteye flounders)
- Family **Paralichthyidae** Regan 1910 (sand flounders)
- Family **Pleuronectidae** Rafinesque 1815 (righteye flounders)
 - Subfamily **Atheresthinae** Vinnikov, Thomson & Munroe 2018
 - Subfamily **Pleuronichthyinae** Vinnikov, Thomson & Munroe 2018
 - Subfamily **Microstominae** Cooper & Chapleau 1998 (smallmouth flounders)
 - Subfamily **Hippoglossinae** Gill 1864 (halibuts)
 - Subfamily **Pleuronectinae** Rafinesque 1815 (true flounders)
- Family **Paralichthodidae** Regan 1920 (peppered flounders)
- Family **Oncopteridae** Jordan & Goss 1889 (remo flounders)
- Family **Rhombosoleidae** Regan 1910 (South Pacific flounders)
- Family **Achiropsettidae** Heemstra 1990 (southern flounders or armless flounders)
- Family **Achiridae** Rafinesque 1815 (American soles)
- Family **Samaridae** Jordan & Goss 1889 (crested flounders)
- Family **Poecilopsettidae** Norman 1934 (bigeye flounders)
- Family **Soleidae** Bonaparte 1833 (soles)
- Family **Cynoglossidae** Jordan 1888 (tonguefishes)
 - Subfamily **Symphurinae** Ochiai 1963 (straight snout tongue soles)
 - Subfamily **Cynoglossinae** Jordan 1888 (hooked snout tongue soles)
- o Suborder **Toxotoidei**
 - Family **Leptobramidae** Ogilby 1913 (beachsalmons)
 - Family **Toxotidae** Bleeker 1859 (archerfishes)

- o Suborder **Nematistioidei**
 - Family **Nematistiidae** Gill 1862 (roosterfishes)
- o Suborder **Menoidei**
 - Family **Menidae** Fitzinger 1873 (moonfishes)
 - Family **Xiphiidae** Rafinesque 1815 (swordfishes)
 - Family **Istiophoridae** Rafinesque 1815 (billfishes and marlins)
- o Suborder **Carangoidei**
 - Family **Carangidae** Rafinesque 1815 (jacks or jack mackerels)
 - Subfamily **Naucratinae** Bleeker 1859 (amberjacks)
 - Subfamily **Caranginae** Rafinesque 1815 (trevallies and kingfishes)
 - Subfamily **Scomberoidinae** Jordan & Gilbert 1883 (leatherjackets and queenfishes)
 - Subfamily **Trachinotinae** Gill 1861 (pompanos)
 - Family **Echeneidae** Rafinesque 1810 (remoras and sharksuckers)
 - Family **Rachycentridae** Gill 1896 (cobias)
 - Family **Coryphaenidae** Rafinesque 1815 (dolphinfishes)
- Order **Atheriniformes**
 - o Family **Atherinidae** Risso 1827 (Old World silversides)
 - Subfamily **Atherinomorinae** Dyer & Chernoff 1996 (tropical silversides)
 - Subfamily **Atherininae** Risso 1827 (silversides)
 - Subfamily **Craterocephalinae** Dyer & Chernoff 1996 (hardyheads)
 - Subfamily **Bleheratherininae** Aarn & Ivantsoff 2009 (New Caledonian silversides)
 - o Family **Bedotiidae** Jordan & Hubbs 1919 (Malagasy rainbowfishes)
 - o Family **Melanotaeniidae** Gill 1894 (rainbowfishes)
 - o Family **Pseudomugilidae** Kner 1867 (blue eyes)
 - o Family **Telmatherinidae** Munro 1958 (sailfin silversides)
 - o Family **Notocheiridae** Schultz 1950 (surf silversides)
 - o Family **Isonidae** Rosen 1964 (surf sardines)
 - o Family **Atherionidae** Schultz 1948 (pricklenose silversides)

- o Family **Dentatherinidae** Patten & Ivantsoff 1983 (tusked silversides)
- o Family **Phallostethidae** Regan 1916 (priapum fishes)
- o Family **Atherinopsidae** Fitzinger 1873 (New World silversides)
 - Subfamily **Atherinopsinae** Fitzinger 1873 (neotropical silversides)
 - Subfamily **Menidiinae** Schultz 1948 (Gulf of Mexico silversides)
- Order **Beloniformes**
 - o Family **Scomberesocidae** Bleeker 1858 (sauries)
 - o Family **Belonidae** Bonaparte 1835 (needlefishes)
 - o Family **Hemiramphidae** Gill 1859 (halfbeaks)
 - o Family **Zenarchopteridae** Fowler 1934 (internally fertilized halfbeaks)
 - o Family **Exocoetidae** Risso 1827 (flyingfishes)
 - o Family **Adrianichthyidae** Weber 1913 (adrianichthyids)
 - Subfamily **Oryziinae** Myers 1938 (medakas or ricefishes)
 - Subfamily **Adrianichthyinae** Weber 1913 (adrianichthyines)
- Order **Cyprinodontiformes**
 - o Suborder **Aplocheiloidei**
 - Family **Aplocheilidae** Bleeker 1859 (Old World rivulins)
 - Family **Nothobranchiidae** Garman 1895 (African rivulins)
 - Family **Rivulidae** Myers 1925 (New World rivulins)
 - Subfamily **Kryptolebiatinae** Costa 2004 (mangrove killifishes)
 - Subfamily **Cynolebiinae** Hoedeman 1961 (pearl killifishes)
 - Subfamily **Rivulinae** Myers 1925 (rivulines)
 - o Suborder **Cyprinodontoidei**
 - Family **Pantanodontidae** Myers 1955 (spine killifishes)
 - Family **Fundulidae** Günther 1866 (topminnows and killifishes)
 - Family **Cyprinodontidae** Wagner 1828 (killifishes)
 - Subfamily **Cubanichthyinae** Parenti 1981 (island pupfishes)
 - Subfamily **Cyprinodontinae** Wagner 1828 (pupfishes)
 - Subfamily **Orestiinae** Bleeker 1859 (Andean killifishes)
 - Family **Profundulidae** Hoedeman & Bronner 1951 (Middle American killifishes)

- Family **Goodeidae** Jordan & Gilbert 1883 (splitfins)
 - Subfamily **Empetrichthyinae** Jordan, Evermann & Clark 1930 (springfishes)
 - Subfamily **Goodeinae** Jordan & Gilbert 1883 (Mexican splitfins)
- Family **Fluviophylacidae** Roberts 1970 (American lampeyes)
- Family **Poeciliidae** Bonaparte 1831 (poeciliids)
 - Subfamily **Xenodexiinae** Hubbs 1950 (Guatemalan poeciliids)
 - Subfamily **Tomeurinae** Eigenmann 1912 (facultative viviparous poeciliids)
 - Subfamily **Poeciliinae** Bonaparte 1831 (livebearers)
- Family **Anablepidae** Bonaparte 1831 (four-eyed fishes and onesided livebearers)
 - Subfamily **Anablepinae** Bonaparte 1831 (four-eyed fishes)
 - Subfamily **Oxyzygonectinae** Parenti 1981 (white-eyes)
- Family **Aphaniidae** Hoedeman 1949 (Oriental killifishes)
- Family **Valenciidae** Parenti 1981 (European killifishes)
- Family **Procatopodidae** Fowler 1916 (African lampeyes)
 - Subfamily **Aplocheilichthyinae** Myers 1928 (banded lampeyes)
 - Subfamily **Procatopodinae** Fowler 1916 (lampeyes)
- Order **Cichliformes**
 - Family **Polycentridae** Gill 1858 (leaffishes)
 - Family **Cichlidae** Bonaparte 1835 (cichlids)
 - Subfamily **Etroplinae** Kullander 1998 (Indian and Madagascan cichlids)
 - Subfamily **Ptychochrominae** Sparks 2004 (Malagasy cichlids)
 - Subfamily **Pseudocrenilabrinae** Fowler 1934 (African cichlids)
 - Subfamily **Cichlinae** Bonaparte 1835 (American cichlids)
 - Family **Pholidichthyidae** Jordan 1896 (convict-blennies)
- Order **Mugiliformes**
 - Family **Ambassidae** Klunzinger 1870 (Asiatic glassfishes)

- o Family **Mugilidae** Jarocki 1822 (mullets)
- Order **Blenniiformes**
 - o Family **Pseudochromidae** Müller & Troschel 1849 (dottybacks)
 - Subfamily **Pseudochrominae** Müller & Troschel 1849
 - Subfamily **Pseudoplesiopinae** Bleeker 1875
 - Subfamily **Anisochrominae** Smith 1954
 - Subfamily **Congrogadinae** Günther 1862 (eelblennies)
 - Subfamily **Assiculinae** Gill 2013
 - Subfamily **Assiculoidinae** Gill 2013
 - o Family **Plesiopidae** Günther 1861 (roundheads)
 - Subfamily **Plesiopinae** Günther 1861
 - Subfamily **Acanthoclininae** Günther 1861 (spiny basslets)
 - o Family **Pomacentridae** Bonaparte 1831 (damsel-fishes and anemonefishes)
 - Subfamily **Microspathodontinae** Jordan & Evermann 1898 (giant damselfishes)
 - Subfamily **Chrominae** Bonaparte 1831 (chromises)
 - Subfamily **Glyphisodontinae** Rafinesque 1815 (sergeants majors)
 - Subfamily **Pomacentrinae** Bonaparte 1831 (anemonefishes or clownfishes)
 - o Family **Embiotocidae** Agassiz 1853 (surfperches)
 - o Family **Grammatidae** Jordan 1887 (gramma basslets)
 - o Family **Opistognathidae** Bonaparte 1835 (jawfishes)
- Suborder **Gobiesocoidi**
 - o Family **Gobiesocidae** Bleeker 1859 (clingfishes)
 - Subfamily **Diplocrepinae** Briggs 1955
 - Subfamily **Lepadogastrinae** Canestrini 1871-72
 - Subfamily **Chorisochisminae** Briggs 1955
 - Subfamily **Haplocyclicinae** Briggs 1955
 - Subfamily **Protogobiesocinae** Fricke, Chen & Chen 2016 (ancestral clingfishes)
 - Subfamily **Cheilobranchinae** Günther 1870 (shore-eels)

- Subfamily **Trachelochisminae** Briggs 1955
- Subfamily **Diademichthyinae** Whitley 1950
- Subfamily **Gobiesocinae** Bleeker 1859 (New World clingfishes)
- Suborder **Blennioidei**
 - Family **Tripterygiidae** Whitley 1931 (triplefins or threefin blennies)
 - Subfamily **Notoclininae** Fricke 2009
 - Subfamily **Tripterygiinae** Whitley 1931
 - Family **Blenniidae** Rafinesque 1810 (combtooth blennies)
 - Subfamily **Blenniinae** Rafinesque 1810 (blennies)
 - Subfamily **Salariinae** Gill 1859 (salariin blennies)
 - Family **Clinidae** Swainson 1839 (kelp blennies)
 - Family **Labrisomidae** Clark Hubbs 1952 (labrisomid blennies)
 - Family **Chaenopsidae** Gill 1865 (pikeblennies or tube blennies)
 - Family **Dactyloscopidae** Gill 1859 (sand stargazers)
- Order **Perciformes**
 - Suborder **Percoidei**
 - Family **Serranidae** Swainson 1839 (sea basses)
 - Family **Anthiadidae** Poey 1861 (fairy basslets or streamer basses)
 - Family **Epinephelidae** Bleeker 1874 (groupers)
 - Family **Liopropomatidae** Poey 1867 (painted basslets)
 - Subfamily **Liopropomatinae** Poey 1867
 - Subfamily **Diploprioninae** Bleeker 1874 (barred soapfishes)
 - Family **Grammistidae** Bleeker 1857 (soapfishes)
 - Family **Percidae** Rafinesque 1815 (perches and darters)
 - Subfamily **Percinae** Rafinesque 1815 (freshwater perches)
 - Subfamily **Luciopercinae** Jordan & Evermann 1896 (pikeperches and Danube perches)
 - Subfamily **Etheostomatinae** Agassiz 1850 (North American darters)
 - Family **Nipponidae** Jordan 1923 (Ara groupers)
 - Family **Trachinidae** Rafinesque 1815 (weeverfishes)

- Family **Bembropidae** Regan 1913 (flatheads or duckbill flatheads)
- o Suborder **Notothenioidei**
 - Family **Percophidae** Swainson 1839 (Brazilian flatheads)
 - Family **Bovichtidae** Gill 1862 (thornfishes)
 - Family **Pseudaphritidae** McCulloch 1929 (congollis)
 - Family **Eleginopidae** Gill 1893 (Patagonian blennies or Falkland Islands blennies)
 - Family **Nototheniidae** Günther 1861 (cod icefishes)
 - Subfamily **Pleuragrammatinae** Andersen & Hureau 1979
 - Subfamily **Nototheniinae** Günther 1861 (notothens)
 - Subfamily **Trematominiae** Balushkin 1982
 - Family **Harpagiferidae** Gill 1861 (plunderfishes)
 - Subfamily **Harpagiferinae** Gill 1861 (spiny plunderfishes)
 - Subfamily **Artedidraconinae** Andriashev 1967 (barbeled plunderfishes)
 - Family **Bathydraconidae** Regan 1913 (Antarctic dragonfishes)
 - Subfamily **Bathydraconinae** Regan 1913
 - Subfamily **Gymnodraconinae** Andriashev 1983
 - Subfamily **Cygnodraconinae** no valid family-group name description
 - Family **Channichthyidae** Gill 1861 (crocodile icefishes)
- o Suborder **Scorpaenoidei**
 - Family **Platycephalidae** Swainson 1839 (flatheads)
 - Family **Hoplichthyidae** Kaup 1873 (spiny flatheads)
 - Family **Triglidae** Rafinesque 1815 (searobins)
 - Subfamily **Prionotinae** Kaup 1873 (spiny searobins)
 - Subfamily **Peristediinae** Jordan & Gilbert 1883 (armored gurnards)
 - Subfamily **Pterygotriglinae** Fowler 1938 (spotted gurnards)
 - Subfamily **Triglinae** Rafinesque 1815 (gurnards)
 - Family **Bembridae** Kaup 1873 (deepwater flatheads)
 - Family **Synanceiidae** Swainson 1839 (stonefishes)

- Subfamily **Apistinae** Gill 1859 (wasp scorpionfishes)
- Subfamily **Perryeninae** Honma, Imamura & Kawai 2013 (whitenose pigfishes)
- Subfamily **Eschmeyerinae** Mandrytsa 2001 (cofishes)
- Subfamily **Gnathanacanthinae** Gill 1892 (red velvetfishes)
- Subfamily **Aploactininae** Jordan & Starks 1904 (velvetfishes)
- Subfamily **Pataecinae** Gill 1872 (prowfishes)
- Subfamily **Tetraroginae** Smith 1949 (waspfishes)
- Subfamily **Choridactylinae** Kaup 1859 (stingers)
- Subfamily **Synanceiinae** Swainson 1839 (stonefishes)
- Family **Neosebastidae** Matsubara 1943 (gurnard scorpionfishes)
- Family **Plectrogeniidae** Fowler 1938 (stinger flatheads)
- Family **Scorpaenidae** Risso 1827 (scorpionfishes)
 - Subfamily **Scorpaeninae** Risso 1827 (scorpionfishes)
 - Subfamily **Caracanthinae** Gill 1885 (coral crouchers)
 - Subfamily **Pteroinae** Kaup 1873 (turkeyfishes and lionfishes)
 - Subfamily **Setarchinae** Matsubara 1943 (deepsea bristly scorpionfishes)
 - Subfamily **Sebastolobinae** Matsubara 1943 (thornyheads)
 - Subfamily **Sebastinae** Kaup 1873 (rockfishes)
- Family **Congiopodidae** Gill 1889 (racehorses or pigfishes)
- Family **Zanclorhynchidae** Andriashev 1993 (horsefishes)
- Family **Normanichthyidae** Clark 1937 (barehead scorpionfishes)
- o Suborder **Cottoidei**
 - Family **Anoplopomatidae** Jordan & Gilbert 1883 (sablefishes)
 - Family **Zaniolepididae** Jordan & Gilbert 1883 (combfishes)
 - Family **Hexagrammidae** Jordan 1888 (greenlings)
 - Subfamily **Hexagramminae** Jordan 1888 (greenlings)
 - Subfamily **Pleurogramminae** Rutenberg 1954 (Atka mackerels)
 - Subfamily **Ophiodontinae** Jordan & Gilbert 1883 (lingcods)

- Subfamily **Oxylebiinae** Gill 1862 (painted greenlings)
- Family **Rhamphocottidae** Jordan & Gilbert 1883 (horsehead sculpins or grunt sculpins)
- Family **Jordaniidae** Jordan & Evermann 1898 (longfin sculpins)
- Family **Cottidae** Bonaparte 1831 (sculpins)
- Family **Psychrolutidae** Günther 1861 (marine sculpins)
- Family **Agonidae** Swainson 1839 (poachers)
 - Subfamily **Agoninae** Swainson 1839 (sturgeon poachers)
 - Subfamily **Anoplagoninae** Gill 1861 (alligator fishes)
 - Subfamily **Bathyagoninae** Lindberg 1971 (starsnouts)
 - Subfamily **Brachyopsinae** Jordan & Evermann 1898 (uppermouth poachers)
 - Subfamily **Hypsagoninae** Gill 1861 (dragon poachers)
 - Subfamily **Bothragoninae** Lindberg 1971 (rockheads)
 - Subfamily **Hemitriptarinae** Gill 1865 (sailfin sculpins)
- Family **Trichodontidae** Bleeker 1859 (sandfishes)
- Family **Cyclopteridae** Bonaparte 1831 (lumpfishes)
 - Subfamily **Cyclopterinae** Bonaparte 1831 (lumpsuckers)
 - Subfamily **Liparopsinae** Garman 1892 (smooth lumpsuckers)
 - Subfamily **Eumicrotreminae** Oku, Imamura & Yabe 2017 (spiny lumpsuckers)
- Family **Liparidae** Gill 1861 (snailfishes)
- o Suborder **Gasterosteoidae**
 - Family **Hypoptychidae** Steindachner 1880 (sand-eels)
 - Family **Gasterosteidae** Bonaparte 1831 (sticklebacks)
 - Family **Aulorhynchidae** Gill 1861 (tubesnouts)
- o Suborder **Zoarcoidei**
 - Family **Zoarcidae** Swainson 1839 (eelpouts)
 - Subfamily **Lycodinae** Gill 1861
 - Subfamily **Lycozoarcinae** Andriashev 1939
 - Subfamily **Zoarcinae** Swainson 1839 (eelpouts)

- Subfamily **Gymnelinae** Gill 1863 (pouts)
- Family **Anarhichadidae** Bonaparte 1835 (wolffishes)
- Family **Neozoarcidae** Jordan & Snyder 1902
- Family **Eulophiidae** Smith 1902
- Family **Stichaeidae** Gill 1864 (pricklebacks)
 - Subfamily **Stichaeinae** Gill 1864
 - Subfamily **Chirolophinae** Jordan & Evermann 1898
 - Subfamily **Alectriinae** Makushok 1958 (cockscombs)
 - Subfamily **Xiphisterinae** Jordan 1880
- Family **Lumpenidae** Jordan & Evermann 1898 (eel pricklebacks)
- Family **Opisthocentridae** Jordan & Evermann 1898
- Family **Pholidae** Gill 1893 (gunnels)
 - Subfamily **Pholinae** Gill 1893 (pigmented gunnels)
 - Subfamily **Apodichthyinae** Hubbs 1927 (penpoint gunnels)
- Family **Ptilichthyidae** Jordan & Gilbert 1883 (quillfishes)
- Family **Zaproridae** Jordan 1896 (prowfishes)
- Family **Cryptacanthodidae** Gill 1861 (wrymouths)
- Family **Cebidichthyidae** Gill 1862 (monkeyface pricklebacks)
- Family **Scytalinidae** Jordan & Starks 1895 (graveldivers)
- Family **Bathymasteridae** Jordan & Gilbert 1883 (ronquils)
- Order **Centrarchiformes**
 - Suborder **Percalatoidei**
 - Family **"Percalates-clade"** (Australian basses)
 - Suborder **Terapontoidei**
 - Family **Girellidae** Gill 1862 (nibblers)
 - Family **Scorpididae** Günther 1860 (halfmoons)
 - Family **Kyphosidae** Jordan 1887 (sea chubs)
 - Family **Kuhliidae** Jordan & Evermann 1896 (flagtails or aholeholes)
 - Family **Terapontidae** Richardson 1842 (grunters or tigerfishes)
 - Family **Dichistiidae** Smith 1935 (galjoens)

- Family **Oplegnathidae** Bleeker 1853 (knifejaws)
- Family **Caesiocorpididae** Parenti & Randall 2020 (blowhole perches)
- Family **Microcanthidae** Bleeker 1876 (stripeys)
- o Suborder **Centrarchoidei**
 - Family **Centrarchidae** Bleeker 1859 (sunfishes and freshwater basses)
 - Subfamily **Centrarchinae** Bleeker 1859
 - Subfamily **Lepominae** Gill 1864
 - Family **Elassomatidae** Jordan 1877 (pygmy sunfishes)
 - Family **Sinipercidae** Jordan & Richardson 1910 (Chinese perches)
 - Family **Enoplosidae** Gill 1893 (oldwives)
 - Family **Percichthyidae** Jordan & Eigenmann 1890 (temperate basses)
 - Family **Perciliidae** Jordan 1923 (southern basses)
 - Family **Parascorpididae** Smith 1949 (jutjaws)
- o Suborder **Cirrhitioidei**
 - Family **Cirrhitidae** Macleay 1841 (hawkfishes)
 - Family **Chironemidae** Gill 1862 (kelpfishes)
 - Family **Aplodactylidae** Günther 1859 (marblefishes)
 - Family **Cheilodactylidae** Bonaparte 1850 (fingerfins)
 - Family **Latridae** Gill 1862 (trumpeters)
- Order **Labriformes**
 - o Suborder **Labroidei**
 - Family **Centrogenyidae** Fowler 1907 (false scorpionfishes)
 - Family **Labridae** Cuvier 1816 (wrasses)
 - Family **Odacidae** Günther 1861 (cales)
 - o Suborder **Uranoscopoidei**
 - Family **Ammodytidae** Bonaparte 1835 (sand lances)
 - Family **Uranoscopidae** Bonaparte 1831 (stargazers)
 - Family **Leptoscopidae** Gill 1859 (southern sandfishes)
 - Family **Pinguipedidae** Günther 1860 (sandperches)
 - Family **Cheimarrichthyidae** Regan 1913 (New Zealand torrentfishes)

- Order **Acropomatiformes**

- Family **Scombropidae** Gill 1862 (gnomefishes)
- Family **Ostracoberycidae** Fowler 1934 (shellskin alfonosinos)
- Family **Acropomatidae** Gill 1893 (lanternbellies)
- Family **Symphysanodontidae** Katayama 1984 (slopefishes)
- Family **Epigonidae** Poey 1861 (deepwater cardinalfishes)
- Family **Howellidae** Ogilby 1899 (lanternbellies or oceanic basslets)
- Family **Polyprionidae** Bleeker 1874 (wreckfishes)
- Family **Lateolabracidae** Ghedotti, Davis and Smith 2018 (Asian seaperches)
- Family **Glaucosomatidae** Jordan & Thompson 1911 (pearl perches)
- Family **Pemppheridae** Bleeker 1859 (sweepers)
- Family **Dinolestidae** Whitley 1948 (longfinned pikes)
- Family **Stereolepididae** Smith, Ghedotti & Davis 2022 (giant sea basses)
- Family **Banjosidae** Jordan & Thompson 1912 (banjofishes)
- Family **Pentacerotidae** Bleeker 1859 (armorheads)
 - Subfamily **Histiopterinae** Bleeker 1876 (sailfin armorheads)
 - Subfamily **Pentacerotinae** Bleeker 1859
- Family **Malakichthyidae** Jordan & Richardson 1910 (temperate ocean-basses)
- Family **Champsodontidae** Jordan & Snyder 1902 (gapers)
- Family **Hemerocoetidae** Kaup 1873 (Indo-Pacific duckbills)
- Family **Creediidae** Waite 1899 (sand burrowers)
- Family **Synagropidae** Smith 1961 (splitfin ocean-basses)
- Family **Bathyclupeidae** Gill 1896 (deepsea herrings)

- Order **Acanthuriformes**

- Family **Gerreidae** Bleeker 1859 (mojarra)
- Family **Sillaginidae** Richardson 1846 (sillagos)
- Family **Moronidae** Jordan & Evermann 1896 (white basses or temperate basses)
- Family **Drepaneidae** Gill 1872 (sicklefishes)
- Family **Ephippidae** Bleeker 1859 (spadefishes and batfishes)

- o Family **Sciaenidae** Cuvier 1829 (croakers and drums)
- o Family **Dinopercidae** Heemstra & Hecht 1986 (cavebasses)
- o Family **Haemulidae** Gill 1885 (grunts)
 - Subfamily **Haemulinae** Gill 1885
 - Subfamily **Plectorhinchinae** Jordan & Thompson 1912 (sweetlips)
- o Family **Lobotidae** Gill 1861 (tripletails and tigerperches)
- o Family **Monodactylidae** Jordan & Evermann 1898 (moonies)
- o Family **Emmelichthyidae** Poey 1867 (rovers)
- o Family **Lutjanidae** Gill 1861 (snappers)
 - Subfamily **Apsilinae** Johnson 1980
 - Subfamily **Etelinae** Gill 1893 (snappers)
 - Subfamily **Paradicichthyinae** Whitley 1930 (sailfin snappers)
 - Subfamily **Lutjaninae** Gill 1861 (snappers & fusiliers)
- o Family **Malacanthidae** Poey 1861 (tilefishes or sand tilefishes)
- o Family **Latilidae** Gill 1862 (deepwater tilefishes)
- o Family **Pomacanthidae** Jordan & Evermann 1898 (angelfishes)
- o Family **Chaetodontidae** Rafinesque 1815 (butterflyfishes)
 - Subfamily **Heniochinae** Kaup 1860 (bannerfishes)
 - Subfamily **Chaetodontinae** Rafinesque 1815 (butterflyfishes)
- o Family **Leiognathidae** Gill 1893 (ponyfishes or slipmouths)
 - Subfamily **Leiognathinae** Gill 1893
 - Subfamily **Gazzinae** Chakrabarty & Sparks 2015
- o Family **Luvaridae** Gill 1885 (luvars)
- o Family **Zanclidae** Bleeker 1876 (Moorish idols)
- o Family **Acanthuridae** Bonaparte 1835 (surgeonfishes and unicornfishes)
- o Family **Callanthiidae** Ogilby 1899 (splendid perches)
- o Family **Nemipteridae** Regan 1913 (threadfin breams and spinycheeks)
- o Family **Lethrinidae** Bonaparte 1831 (emperor snappers)
 - Subfamily **Lethrininae** Bonaparte 1831 (emperors)
 - Subfamily **Monotaxinae** Akazaki 1961 (big-eye seabreams)

- o Family **Sparidae** Rafinesque 1818 (porgys and seabreams)
- o Family **Siganidae** Richardson 1837 (rabbitfishes)
- o Family **Scatophagidae** Gill 1883 (scats)
- o Family **Cepolidae** Rafinesque 1815 (bandfishes)
 - Subfamily **Cepolinae** Rafinesque 1815
 - Subfamily **Owstoniinae** Jordan, Tanaka & Snyder 1913
- o Family **Priacanthidae** Günther 1859 (bigeyes)
- o Family **Caproidae** Bonaparte 1835 (boarfishes)
- o Family **Antigoniidae** Jordan & Evermann 1898 (deepwater boarfishes)
- Order **Lophiiformes**
 - o Suborder **Lophioidei**
 - Family **Lophiidae** Rafinesque 1810 (goosefishes or monkfishes)
 - o Suborder **Ogcocephaloidei**
 - Family **Ogcocephalidae** Gill 1893 (batfishes)
 - o Suborder **Antennarioidei**
 - Family **Rhycheridae** Hart, Arnold, Alda, Kenaley, Pietsch, Hutchinson & Chakrabarty 2022 (Balrog frogfishes)
 - Family **Brachionichthyidae** Gill 1863 (warty anglerfishes)
 - Family **Antennariidae** Jarocki 1822 (Fibonacci frogfishes)
 - Family **Histiophrynidae** Arnold & Pietsch 2012 (starfingered frogfishes)
 - Family **Tathicarpidae** Hart, Arnold, Alda, Kenaley, Pietsch, Hutchinson & Chakrabarty 2022 (longfin frogfishes)
 - Family **Tetrabrachiidae** Regan 1912 (tetrabrachiid frogfishes)
 - Family **Lophichthyidae** Boeseman 1964 (lophichthyid frogfishes)
 - o Suborder **Chaunacoidei**
 - Family **Chaunacidae** Gill 1863 (gapers or sea toads)
 - o Suborder **Ceratioidei**
 - Family **Caulophrynidae** Goode & Bean 1896 (fanfins)
 - Family **Neoceratiidae** Regan 1926 (needlebeard seadevils or spiny seadevils)
 - Family **Melanocetidae** Gill 1878 (black seadevils)

- Family **Himantolophidae** Gill 1861 (footballfishes)
- Family **Diceratiidae** Regan & Trewavas 1932 (doublespine seadevils)
- Family **Oneirodidae** Gill 1878 (dreamers)
- Family **Thaumatichthyidae** Smith & Radcliffe 1912 (wolftrap seadevils)
- Family **Centrophrynidae** Bertelsen 1951 (prickly seadevils)
- Family **Ceratiidae** Gill 1861 (seadevils)
- Family **Gigantactinidae** Boulenger 1904 (whipnose seadevils)
- Family **Linophrynidae** Regan 1925 (leftvent seadevils)
- Order **Tetraodontiformes**
 - Suborder **Triacanthodoidei**
 - Family **Triacanthodidae** Gill 1862 (spikefishes)
 - Family **Triacanthidae** Bleeker 1859 (triplespines)
 - Suborder **Tetraodontoidei**
 - Family **Triodontidae** Bleeker 1859 (threetooth puffers)
 - Family **Molidae** Bonaparte 1832 (molas or ocean sunfishes)
 - Family **Diodontidae** Billberg 1833 (porcupinefishes and burrfishes)
 - Family **Tetraodontidae** Bonaparte 1831 (puffers)
 - Suborder **Balistoidei**
 - Family **Aracanidae** Hollard 1860 (deepwater boxfishes)
 - Family **Ostraciidae** Rafinesque 1810 (boxfishes)
 - Family **Monacanthidae** Nardo 1843 (filefishes)
 - Family **Balistidae** Rafinesque 1810 (triggerfishes)
- Class **Coelacanthi**
 - Order **Coelacanthiformes**
 - Family **Latimeriidae** Berg 1940 (coelacanths)
- Class **Dipneusti**
 - Order **Ceratodontiformes**
 - Family **Neoceratodontidae** Schultz 1948 (Australian lungfishes)
 - Family **Lepidosirenidae** Bonaparte 1841 (South American lungfishes)
 - Family **Protopteridae** Peters 1855 (African lungfishes)

FINFISH TAXONOMY -Practical information

Taxonomy is basically the science of correctly naming species. The term has often been confused **with fish identification**, which basically refers to the use of the latest taxonomic information to identify fishes. The job of the Fish Taxonomist is to name and classify species in a way that makes it easier for fisheries scientists, and other “users”, to correctly identify fish species during their work. In other words, fish taxonomy is practiced by very few, whereas fish identification is practised daily by many people.

Descriptive characters in taxonomy

Mouth:

The position of a fish’s mouth can tell you a lot about the feeding habits, living style and type of behaviour it exhibits. Fish mouth types are broadly divided based on three categories: midwater feeders, surface feeders and bottom-feeders.

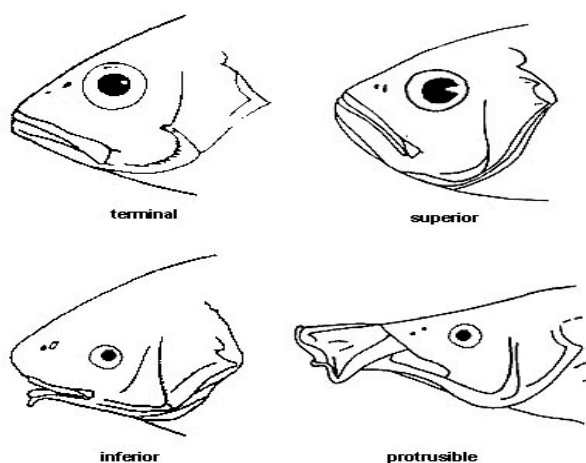
Mouth types:

Terminal: Fish with a terminal mouth position have a mouth in the middle, or centre of the head. These fish are mostly predators who either chase their food or feed on what is seen in front of them. The terminal mouth position is the “normal” position of mouth for most of the fishes inhabiting the middle levels of the water column of oceans or lakes.

Superior: This kind of fish has a scoop-like mouth which is designed to feed on prey that swims above the fish (on the surface of the water), such as insects or plankton.

Inferior: Bottom feeding fish generally have inferior or sub-terminal mouths. Mouths located under the fish head that are adapted for scavenging or grazing on algae, molluscs or bottom dwelling invertebrates.

Protrusible: Protrusible or protractile mouth in fish is a structural arrangement of the jaws that enables the animal to extend the mouth at will. When fully protruded, the cavity of the mouth is enlarged to form a funnel-like space facilitating the uptake of food. Fishes which feed on small invertebrates in hiding have protrusible mouths.



Different mouth patterns (Source: Florida museum)

Teeth

These serve as a very important taxonomic character. Generally, five types of teeth are recognised in fish based on their cardiform, villiform, caniniform, incisiform and molariform.

Teeth types: The following teeth patterns are encountered in the fishes mentioned in the book.

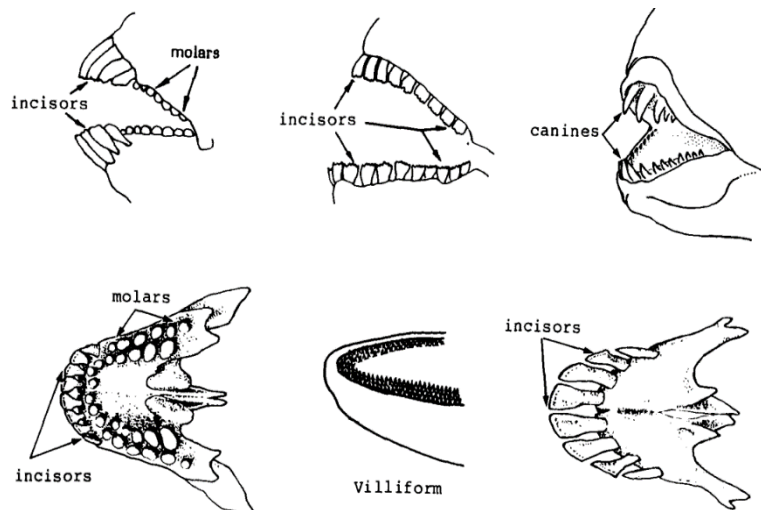
Canine teeth: They are sharp, highly pointed teeth seen in predatory fishes which are seen to attack and hold prey in their sharp teeth. The teeth are also used to tear flesh from the prey. Sharks are the best examples of fishes with canine teeth.



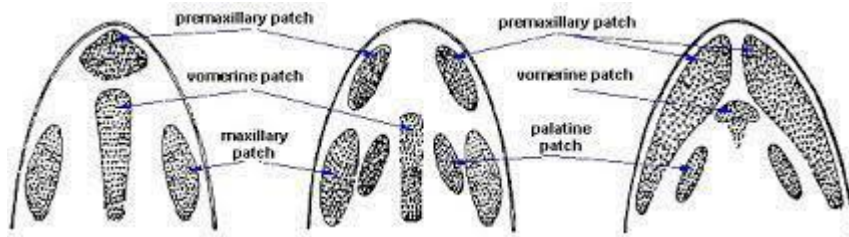
Incisor teeth: Incisors are used for cutting and they come in a variety of shapes. These are flattened teeth with chisel like or saw edges.

Molar teeth: These are blunt, rounded, broad teeth adapted for crushing and grinding shellfish. They are generally found in bottom dwelling fish.

Villiform teeth: Villiform teeth are elongated teeth. They are very long, slender and crowded having the appearance of velvet or fine bristles of a brush. They are more common on deep sea fishes used for stabbing and direction.



Common Teeth patterns (Source: Edwards et al. 2001)

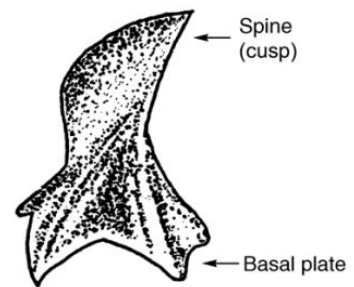


Dental plates: Teeth fused to form beak like plates

Body Scales

Fish scales constitute the external covering of almost all fish species. The structure and configuration of scales can be used to determine the species from which they came. The type of scale will affect the behaviour of a fish--larger, heavier scales providing more protection but restricting movement, and smaller, lighter scales offering more freedom of movement but less protection. There are four different types of fish scale, each with their own characteristics and variations.

Placoid Scales: Placoid scales are formed of a rectangular base plate that is embedded within the skin of the fish and some of spine externally. The interior of the scale is a pulp that receives blood from the fish's vascular system, while the outside is made of an enamel-like substance called vitrodentine. The shape of the spines can vary greatly depending on species. However, almost all give the fish a rough texture. Sharks and rays are examples of fish with placoid scales.

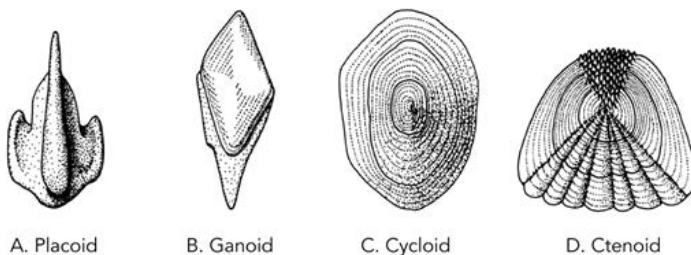


(Source: Diane Elliot, 2011)

Ganoid Scales: Ganoid scales have a bony base layer similar to that of cosmoid scales. and are modified cosmoid scales. However, they differ in that their outer layer is made of an inorganic bone salt called ganoine and that they are diamond-shaped and interconnected. Between ganoid scales are peg-and-socket joints that articulate. Ganoid scales are found on sturgeons, bowfish, paddlefishes and gars.

Cosmoid Scales: Cosmoid scales evolved from placoid scales fusing together. This is because cosmoid scales have two base plates and similar external spines composed of vitrodentine. The base plates are made from bone and new bone is added as the fish grows. Lungfishes and coelacanths have cosmoid scales.

Cycloid and Ctenoid Scales: Cycloid and ctenoid scales have different shapes but the same composition and positioning. Both are composed of collagen and calcium carbonate, rather than bone, and both are overlapping. This means that they are more flexible than the other types of scales. While the edges of cycloid scales are smooth, those of ctenoid scales have tiny teeth-like protrusions called ctenii, giving them a rougher texture. The majority of bony fish have cycloid or ctenoid scales.



Different types of scale

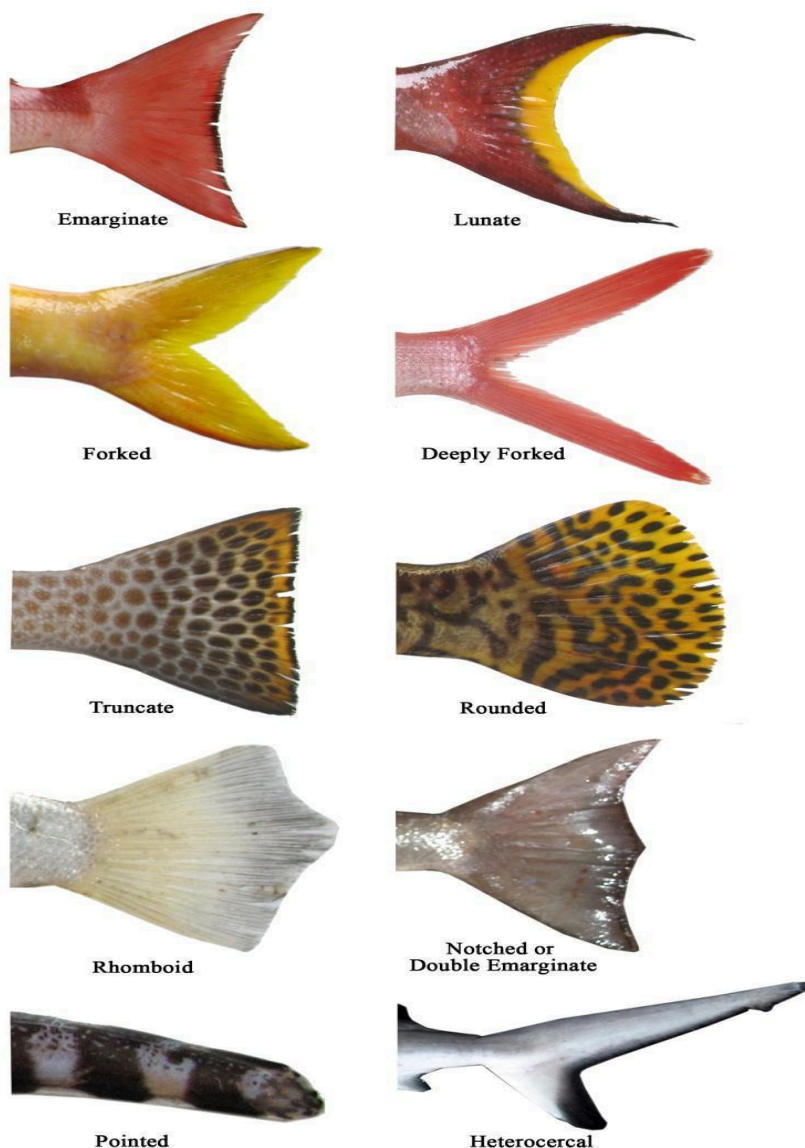
(Source Image from Living Ocean, CRDG, University of Hawaii at Manoa)

Caudal Fin types: The caudal fin is the tail fin, located at the end of the caudal peduncle and is used for propulsion. Types of Caudal fin in our collection.

Heterocercal: the vertebrae extend into the upper lobe of the tail, making it longer. Eg., sharks.

Homocercal: the vertebrae extend for a very short distance into the upper lobe of the fin, but the fin appears superficially symmetric. Most modern fishes are homocercal tailed fishes.

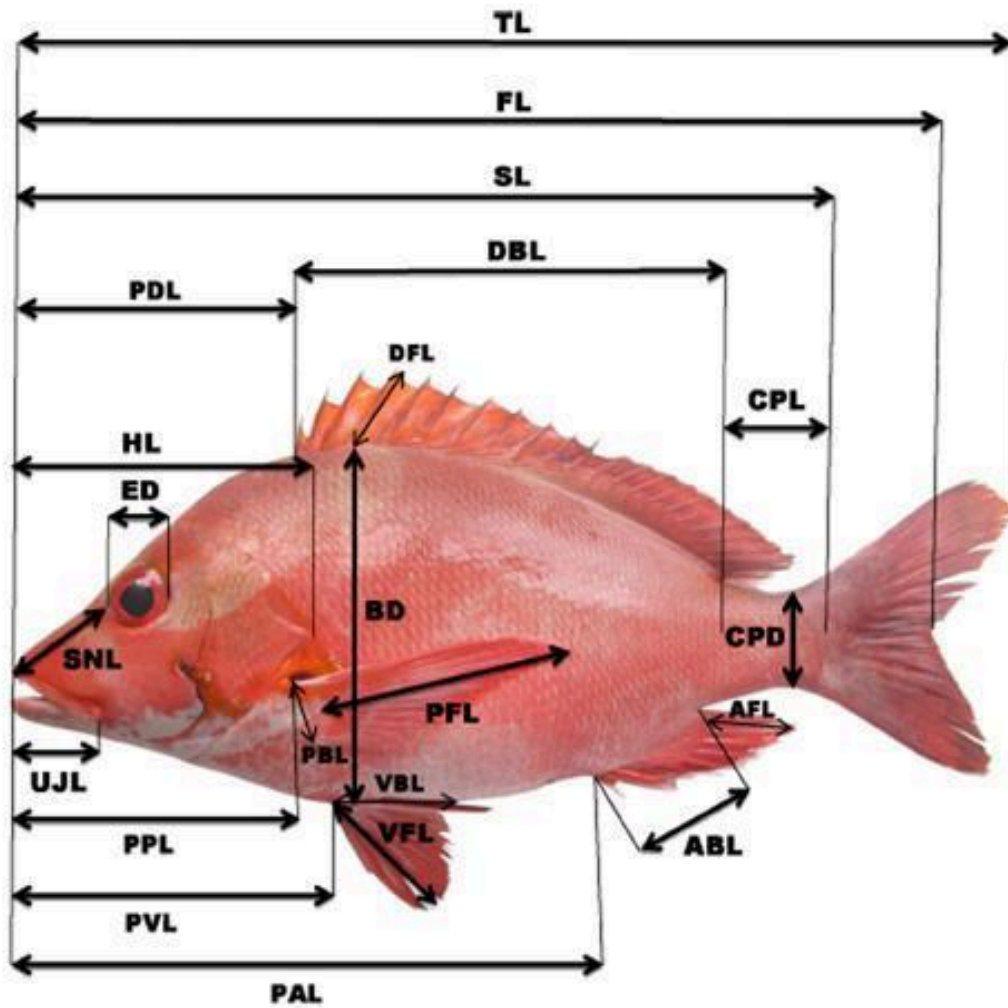
- i. **Round:** ending in round shape
- ii. **Truncate:** ending in vertical edge
- iii. **Forked:** ending in two prolonged edges
- iv. **Emarginate:** ending in a slight inward curve
- v. **Lunate:** ending in crescent shape
- vi. **Rhomboid:** ending in rhomboid shape.



Morphometrics: Measurements must be accurate, point to point and measured using digital vernier callipers in a straight line

- (a) **Total length (TL):** Distance measured from tip of snout to outer free tip of caudal fin. This measurement gives the total length attained by the fish.
- (b) **Standard length (SL):** Distance from tip of snout or upper jaw tip (mouth should be in closed position) to the posterior margin of the hypural bone i.e. last vertebra. This measurement is used for all taxonomic calculations since the tip of the caudal rays are often damaged during collection.
- (c) **Body depth (BD₁, BD₂):** The maximum girth of the body along the dorso-ventral axis is taken as body depth. In bony fishes, it is measured as the distance from the base of the first dorsal fin ray downwards in a straight line (BD₁). The second measurement for body depth is the distance from base of the first anal fin upwards on a perpendicular axis (BD₂).
- (d) **Head length (HL):** The distance from tip of snout or upper jaw to the outer most tip of the operculum.

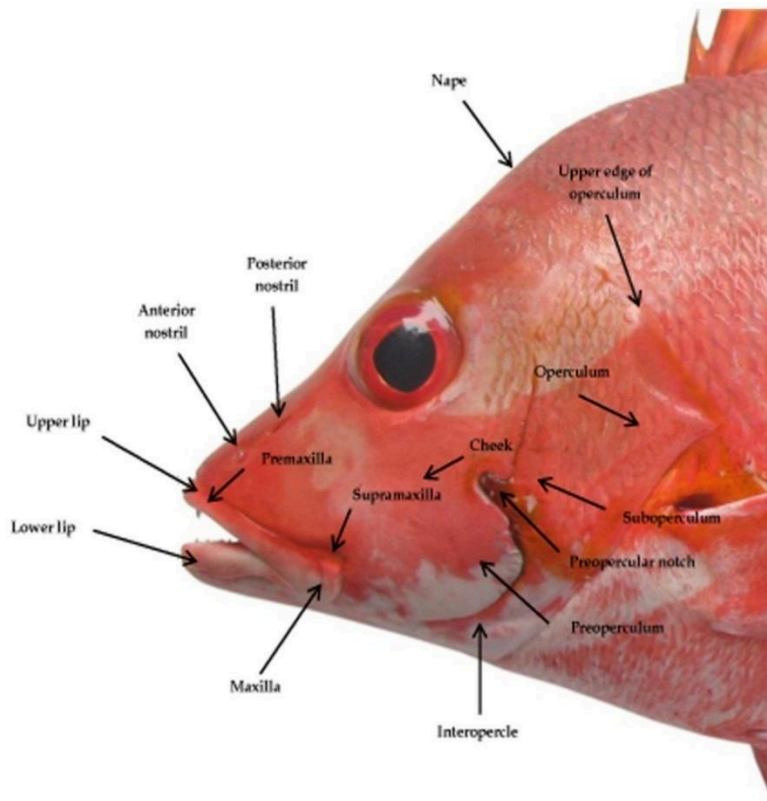
- (e) **Eye diameter (ED):** The horizontal distance at the center of the orbit is taken from the bony anterior to the posterior orbit.
- (f) **Jaw length:** Measurements of upper and lower jaw are taken.
Upper jaw length (UJL) is the distance from tip of premaxillary bone to the outermost end of maxillary bone.
Lower jaw length (LJC) is the length of lower jaw from tip of lower jaw to the end of the bone.
- (g) **Dorsal fin length (DFL):** This is the maximum length of the dorsal fin when stretched. Measurements are taken at both the longest spine and at the soft dorsal tip.
- (h) **Anal fin length (AFL):** The maximum length of the fin when stretched; this is measured at the soft rayed part.
- (i) **Pectoral fin length (P₁FL):** This is the maximum length of the pelvic fin when stretched; measurements are taken at the extreme tip of the fin.
- (j) **Pelvic fin length (V₁FL):** This is the maximum length of the pelvic fin when stretched; measurements are taken at the extreme tip of the fin.
- (k) **Caudal fin length (CFL):** Taken as the distance from base of first caudal fin ray to the outermost tip of caudal region.
- (l) **Dorsal fin base length (DFBL):** The distance from base of first dorsal fin ray to the last fin ray in a straight line.
- (m) **Anal fin base length (AFBL):** The distance from base of first anal fin ray to the last fin ray in a straight line.
- (n) **Pectoral fin base length (PFBL):** The distance from base of first pectoral fin ray to the last fin ray in a straight line.
- (o) **Pelvic fin base length (V₁FB):** The distance from base of first pelvic fin ray to the last fin ray in a straight line.
- (p) **Caudal fin base length (CFB):** The distance from base of first caudal fin ray to the last fin ray in a straight line.
- (q) **Caudal peduncle length:** the distance from the base of the last dorsal ray to the origin of the caudal fin ray in a straight line.
- (r) **Caudal peduncle base:** The vertical distance across base of the caudal fin.
- (s) **Preorbital length (POL):** Distance from tip of snout to anterior tip of the diameter of orbit.
- (t) **Post orbital length (PBL):** Distance from posterior tip of orbit to outer free tip of operculum.



TL – Total Length
 SL – Standard Length
 FL – Fork Length
 HL – Head Length
 ED – Eye Diameter
 SNL – Snout Length
 UJL – Upper Jaw Length

BD – Body Depth
 DFL – Dorsal Fin Length
 DBL – Dorsal Base Length
 PFL – Pectoral Fin Length
 PBL – Pectoral Base Length
 VFL – Ventral Fin Length
 VBL – Ventral Base Length
 AFL – Anal Fin Length

ABL – Anal Base Length
 CPD – Caudal Peduncle Depth
 CPL – Caudal Peduncle Length
 PDL – Pre-dorsal Length
 PPL – Pre-pectoral Length
 PVL – Pre-ventral Length
 PAL – Pre-anal Length



Meristic Counts: Counts are generally taken on the left side of fish.

- **Finray/Spine counts:** Both spine and ray counts are taken on all fins. Dorsal fin counts are written in Roman numerals and rays counts in Arabic numerals eg. X, 6-8., if the spinous and soft-rayed portions of the fin are continuous, the counts are separated by a comma. If the fin is divided into two parts, a plus sign (+) separates the counts, eg. D IX + 4-6. If only a single fin ray is given instead of a range, the count is taken as usual with no variations.
- **Spines** are hardened, stiff, unsegmented, unpaired, unbranched fin rays. Spine counts are characteristic of the genus and does not normally vary between species of the same genus.
- **Rays** are soft, flexible structures that may be branched or unbranched at the tips. The last ray of the dorsal and anal fins is sometimes branched at the base and is to be counted as one ray.
- **Scales:** Scales are calcified structures seen on the outer surface of the body of fish for its protection. Scales counts are variable and the range and average count is normally given in the description.
- **Lateral line scale count** is the number of pored scales in the lateral line. The count begins with the first scale at the outer upper end of the operculum and ends with at the caudal fin base.
- **Lateral scale count** is taken as the number of scales from the lateral line to the base of the first spine of the dorsal fin excluding the lateral line scale.

- **Predorsal scale count** is the number of scales on the middle line from the origin of the first dorsal fin to the occiput.

Body shape:

The simplest way to identify fishes is by their physical shape and appearance. Different species have different profiles when viewed from the side, top or front. Some are slim and elongated, others fat and rounded. Based on their lifestyle and feeding habitat their body shape differs.

Fusiform: Fusiform, or streamlined fish like the barracuda or jack are capable of swimming very fast. They usually live in open water.



Laterally compressed: Fish that are laterally compressed (flattened from side to side) usually do not swim rapidly (some schooling fish are an exception). However, they are exceptionally manoeuvrable. Many, like the angelfish, are found near coral reefs. Their shape allows them to move about in the cracks and crevices of the reef. A flounder is a laterally compressed fish that lies on its side on the bottom. Both eyes migrate to the left or right side early in development.



Depressed: Depressed fish (flattened from top to bottom), like stingrays, live on the bottom.

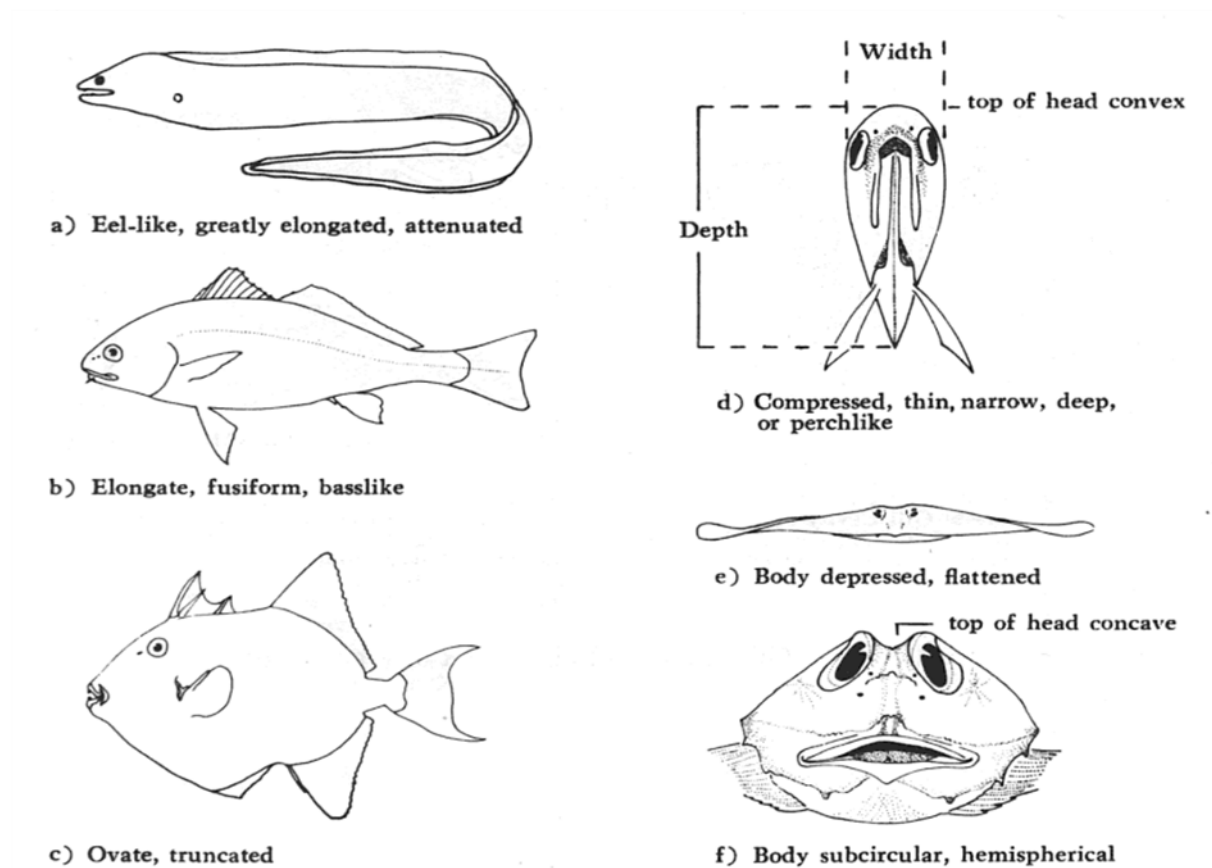
Eel-like: Eel-like fish have a snake-like body shape. The electric eel and moray eels are good examples of fish with this body shape.



Others: Many fish like the boxfish and porcupine fish do not fit into any of these categories. They are slow swimmers with special protective mechanisms.



Ovate, truncated



Colour patterns: Reef fishes in particular have wide and varied colour patterns on their body which makes them highly suitable for life in reef habitats.

Red is a common colour in reef fish. However, most fish that have this coloration live in dark or deep water, or are nocturnal (active at night). In deep waters and in coralline areas, red light is filtered out quickly so red is a good camouflage. At night red-coloured objects appear grey. The squirrelfish has this kind of coloration.

Camouflage: Here, the fish takes on the appearance of the environment. This makes the fish invisible to other fish as well as other predators. This is achieved by

Disruptive: This is in the form of stripes, spots and helps the fish avoid being eaten by confusion. This is a form of camouflage. The patterns and lines break up the outline of the fish or help it to blend into the background. The brightly patterned fish of coral reefs blend in with the corals despite their brilliant colours. Eg. Moorish idol exhibits disruptive coloration.

Counter Shading: This is primarily seen in marine fish where the top half of the fish is darker in colour than the bottom half.

Poster Colouration: This is the most characteristic colouration pattern usually found in reef fish. The fish is characterized by different bright colors. This helps reduce predation on reefs and could be also used as a form of communication.

Warning Colouration: Many fish use bright colours to "advertise" the presence of poisonous spines or some other defensive mechanism. Eg. The Nave surgeonfish has two bright orange spots near the base of the tail that advertise the presence of razor sharp spines.

Mimicry: Here, nontoxic individuals mimic toxic individuals; non-aggressive fish look like aggressive species; predators can mimic prey species (ex. Sabertooth Blenny). Eye spots are a form of mimicry. The eye spot, usually found near the tail, draws attention away from the real eye which is a target that a predator might strike. The eye spot may cause the predator to attack the wrong end and allow the fish to escape alive

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