Acanthopterygii I: Mugilomorpha to Percomorpha

Division Teleostei
Subdivision Euteleostei
Superorder Acanthopterygii

Series Mugilomorpha

Order Mugiliformes No direct articulation between the pelvic girdle and the cleithra.

Mugilidae (mullets) might now be part of Perciformes. Chiefly marine (coastal) and brackish water. Some in freshwater. Distribution: all tropical and temperate seas. Spinous and soft dorsal fins widely separate, the former with 4 spines. Pelvic fins subabdominal. One spine in pelvic fin; soft rays 5. Lateral line hardly visible when present. Mouth of moderate size. Toothless or teeth small. Long gill rakers. Muscular stomach; extremely long intestine. Vertebrae 24-26. About 0.9 m maximum length.

Series Atherinomorpha

Order Atheriniformes Usually two dorsals, sometimes one; anal fin usually preceded by a spine; lateral line absent or very weak.

Atherinidae (silversides) Distribution: tropical to temperate waters. Pelvic fins present and abdominal, subabdominal, or thoracic in position, not modified into clasping organ. California grunion Leuresthes tenuis has a spectacular reproductive periodicity in relation to the tides. Reported maximum length 60 cm.

Order Beloniformes Interarcual cartilage (connects the epibranchial bone of the first gill arch with the infrapharyngobranchial of the second gill arch) small or absent; small second and third epibranchials; interhyal absent.

Belonidae (needlefishes) Tropical and temperate fishes of the surface layer ranging from open ocean to freshwater. Small scales. Without isolated finlets. Dorsal fin usually with 10-26 rays. Anal fin usually with 14-23 rays. Wide mouth opening; jaws elongate and with many needle-like teeth; 2 species with the lower jaw longer than the upper. Slender silvery bodies shaded a darker bluish or greenish dorsally. When alarmed or attracted to lights at night, they are capable of skipping across the surface at high speed and have been known to impale fishermen with sometimes fatal results. Surface-dwelling predators of small fishes, also known as longtoms or sea gars. Important food for larger fishes. To 1.3 m maximum length in Tylosurus crocodilus.

Exocoetidae (flyingfishes) Distribution: Atlantic, Indian, and Pacific Oceans. Jaws of the same length and relatively short. Pectoral fins unusually 1 large and can be used for gliding flights. Moreover, some species have unusually large pelvic fins giving them a four-winged appearance. Caudal fin deeply forked; the upper lobe shorter than the lower. A pair of long, flap-like whiskers in the juveniles of many species. Attains 45 cm maximum length; usually below 30 cm.


Order Cyprinodontiformes Caudal fin symmetrical, supported internally by one epural; first pleural rib on second vertebrae rather than third; low-set pectoral girdle with a scalelike post-cleithrum.

Fundulidae (topminnows and killifishes) Distribution: North and Central America. Shore or inland fishes tolerating a wide salinity range. Teeth in jaws conical; interior (ventral) arms of maxillaries directed anteriorly, often with hooks; maxilla twisted, not straight. 4 genera.

Poeciliidae (livebearers) Distribution: low altitudes from eastern United States to northeastern Argentina. Anal fin with the first 3 rays unbranched. Anterior anal fin rays in males form a gonopodium. Fertilization internal. Viviparous. Some species with all-female individuals, their eggs capable of
developing when stimulated by the sperm of another species without fertilization. Usually less than 18 cm maximum length.

**Series Percomorpha**

**Order Beryciformes** All share a modification of the anterior part of the supraorbital and infraorbital sensory canals termed "Jakubowski’s Organ."

**Holocentridae** (squirrelfishes) Tropical. Atlantic, Indian, and Pacific Oceans. A single spine in pelvic fin; soft rays 5-8 (mode 7). Dorsal fin long with 10-13 spines and a notched soft-rayed part. Forked caudal fin; principal caudal rays 18 or 19. Large and very rough spiny ctenoid scales. Large eyes. Head with strong opercular and preopercular spines that are usually toxic. Vertebrae 26 or 27. Usually reddish in color. Most are nocturnal. Usually cryptic during the day in crevices or beneath ledges of reefs. Most species in shallow water from shoreline to 100 m depth. Adults usually demersal; the very young planktonic. About 61 cm maximum length.

**Order Gasterosteiformes** Pelvic girdle never firmly attached to the cleithra. Body often with armor of dermal plates.


**Fistulariidae** (cornetfishes) Marine; tropical and subtropical. Atlantic, Indian and Pacific Oceans. Body extremely elongate and slightly depressed. Snout prolonged and tubular, without barrels. Scaleless or with tiny prickles and rows of scutes. Dorsal or anal spines absent. Dorsal soft rays 13-20. Anal soft rays 13-20. Forked caudal fin. Caudal filament formed by 2 center rays. Anus close to pelvic fins. Well developed lateral line; anterior portion arched to almost mid-dorsal and extending onto caudal filament. Abdominal vertebrae with two lateral extensions, becoming reduced posteriorly. Vertebral rays 76-87. Maximum length recorded 1.8 m. Feed on other fishes in open water and also in coral reefs to which their tubular snout is adapted.

**Order Scorpaeniformes** Distinguished by the presence of a sub-orbital stay, a posterior extension of the third infraorbital bone (including the lachrymal), which extends across the cheek to the preoperculum and is usually firmly attached to that bone.

**Dactylopteridae** (flying gunards) Marine; benthic. tropical Indo-Pacific and Atlantic. Head large and blunt, with the bones forming a helmet; with keels and a long preopercle spine. Scales scute-like. Head with strong opercular and preopercular spines that are usually toxic. Vertebrae 22. Reaches about 50 cm maximum length. Bears superficial resemblance to triglids; creates sounds by stridulation using the hypomandibular bone. Exhibits a 'walking' movement on the sea floor, accomplished by an alternate movement of the pelvic fins.

**Scorpaenidae** (scorpionfishes) Marine. Rare in fresh water. all tropical and temperate seas. Scales, when present, usually ctenoid. Usually I dorsal fin, often notched. Some lack swim bladder. Dorsal, anal, and pelvic spines can bear venom gland. Fertilization mostly internal; some viviparous. Eggs being laid on a gelatinous balloon in some species. The family contains the world's most venomous fishes, many of them brightly colored.

**Triglidae** (searobins) all temperate and tropical seas. Head bony and casque-like. Pectoral fin with lower 2 or 3
rays enlarged for food detection. Dorsal fins separate. Benthic. Good sound producers. Attains 1 m maximum
length. Cottidae (sculpins) Northern Hemisphere and near New Zealand. Often appears naked. Commonly
bearing scales or prickles. Eye usually large, located high on the head. Lateral line one. One spine on pelvic fin;
soft rays 2-5. Anal fin lacking spines. No swim bladder in adults. Reaches about 78 cm maximum length.

Cottidae (sculpins) Marine and freshwater; Northern hemisphere and eastern Australia, near New Guinea, and
New Zealand. Body often appearing naked, commonly with scales or prickles (never completely encased in bony
armor); eye usually large and placed high on head; lateral line present and single; pelvic fins (absent in one
species) with one spine and 2-5 soft rays; no spines in anal fin; adult without swim bladder. Benthic lifestyle,
mainly invertivores.

Order Perciformes (see attached table)

Suborder Percoidei

Moronidae (temperate basses) Distribution: North America (Atlantic and Gulf of Mexico drainages, introduced
elsewhere), Europe, and northern Africa. Coastal areas. Dorsal fins 2; D1 8-10 spines, D2 1 spine, 10-13 soft
rays. Anal fin 3 spines, 9-12 soft rays. Operculum 2 spines. Lateral line reaching almost the posterior margin of
caudal fin. Auxiliary row of lateral line scales on the caudal fin above and below the main row. Branchiostegal rays

Serranidae (sea basses) Tropical and temperate oceans. Some enter freshwater. Operculum bearing 3 spines -
a main spine with one below and one above it. Lateral line complete and continuous, not reaching onto caudal fin
(lacking in one species). Dorsal fin may be notched, with 7-12 spines. Three spines on anal fin. Caudal fin usually
rounded, truncate, or lunate; rarely forked. Tip of maxilla exposed even with mouth closed. No scaly auxiliary
pelvic process. One spine on pelvic fin; soft rays 5. Branchiostegal rays usually 7. Vertebrae 24-26. Monoecious
with some functional hermaphrodites; groupers are protogynous hermaphrodites. Groupers attain up to 3 m
maximum length and weights of up to 400 kg. They are bottom-dwelling predators and highly commercial food
fish.

Centrarchidae (sunfishes and black basses) North America. Anal spines at least 3. Pseudobranch small and
hidden. Branchiostegal rays 5-7. Separate gill membranes. To about 83 cm maximum length (reported for
Micropterus salmoides). Mostly nest builders. Nest building and guarding done by the male. Valued as sports fish
and used in physiological and ecological experiments. Important game fishes and as a result have been
introduced into many areas outside native range.

Percidae (perches) Northern Hemisphere. Dorsal fins separate or narrowly joined (Zingel with dorsals broadly
united). Anal spines 1 or 2, the second usually weak. Pelvic fins thoracic. A single spine and 5 soft rays in the
pelvic fin. Branchiostegal rays 5-8. Branchiostegal membrane separate from isthmus. Vertebrae 32-50. To 90 cm
maximum length (reported for Stizostedion vitreum). Some species enter estuaries.

Priacanthidae (bigeyes) Tropical and subtropical Atlantic, Indian, and Pacific oceans. Eyes very big, with a
brilliant reflective layer (tapida lucidum). Mouth big and superior (strongly oblique). Dorsal fin spines usually 10;
principal rays in caudal fin (2 unbranched). Inner rays of pelvic fin attached to body by a membrane. Scales very
rough with integral spines, usually bright red in color. Epibenthic and generally associated with rock formations or
coral reefs; a few species are often trawled in more open areas; usually carnivorous and nocturnal. Eggs, larvae
and early juvenile stages are pelagic. Typically less than 30 cm TL, but largest species attains more than 50 cm
maximum length.

Pomatomidae (bluefishes) Atlantic, Indian, and Pacific. Dorsal fins 2. Soft-rayed parts of dorsal and anal fins
scaly. Preopercle bearing a membrane flap over the subopercle. Pectorals with a black blotch at base.

Echeneidae (remoras / sharksuckers) Atlantic, Indian and Pacific. Elongate body, with the head flattened and
bearing a sucking disc having 10-28 transverse movable lamina (disc said to have evolved from a spinous dorsal
in dorsal and anal fins. No swim bladder. Branchiostegal rays 8-11. With the sucking disc, the remora hitches to
larger animals such as sharks, bony fishes, turtles or mammals. Some species reportedly show considerable host
specificity. About 1 m maximum length (reported for Echines naucrates); the smallest species measuring 17 cm.

**Coryphaenidae (dolphinfishes)** Atlantic, Indian and Pacific Ocean. Slender fishes with compressed head and body. The single dorsal fin originates on the head and extends over nearly the full length of the body. No spines; soft rays 48-65. No spines on anal fin. Deeply forked caudal fin. Forehead steep and high in adult males. Live specimens with exceedingly beautiful colors, perhaps the most beautiful live fishes. Vertebrae 30-34. Attains 1.5 m maximum length. Dolphinfishes inhabit the surface waters where they feed upon small fishes and other animals.

**Carangidae (jacks and pompanos)** Chiefly marine; rarely brackish. Atlantic, Indian and Pacific Oceans. Body generally compressed, although body shape extremely variable from very deep to fusiform. Most species with only small cycloid scales. Scales along lateral line often modified into spiny scutes. Detached finlets, as many as nine, sometimes found behind dorsal and anal fins. Large juveniles and adults with 2 dorsal fins. Anterior dorsal fin with 3-9 spines; the second having 1 spine and usually 18-37 soft rays. Anal spines usually 3, the first 2 separate from the rest; soft rays usually 15-31. Widely forked caudal fin. Caudal peduncle slender. Pelvic fins lacking in *Parona signata*. Vertebrae 24-27 (modally 24). One of the most important families of tropical marine fishes; fished commercially and recreationally.

**Chaetodontidae (butterflyfishes)** Marine; tropical to temperate Atlantic, Indian, and Pacific (primarily tropical Indo-West Pacific). Body strongly compressed; no spine at angle of preopercle (small serrations may be present in the preopercle); well-developed axillary process; dorsal fins contiguous or with slight notch; scales extending onto the dorsal and anal fins; gut highly coiled; swim bladder with two anteriorly directed processes. Most are brightly colored, have a dark band running through the eye, and many have an “eyespot” on the dorsal or posterior portion of the body. These patterns are thought to confuse predators. Most species occur in shallow waters (< 20 m) and are associated with structure (mainly coral reefs).

**Lutjanidae (snappers, fusiliers)** Marine (rarely in freshwaters or estuaries); tropical and sub-tropical, Atlantic, Indian, and Pacific. Dorsal fin contiguous or with a shallow notch, with 9-12 spines and 9-18 soft rays; anal fin with 3 spines and 7-11 soft rays; pelvic fins inserted just behind the pectoral base; mouth terminal; most with enlarged canine teeth on jaws, small teeth on palatine and usually on vomer; maxilla slips beneath preorbital when mouth closed. Snappers are important food fish but are sometimes responsible for ciguatera, the tropical fish poisoning disease. They are generally demersal in tropical and subtropical seas from shallow water to depths of 550 meters. Juveniles are known to enter estuaries and freshwater.

**Sciaenidae (croakers, drums)** Marine, brackish, and freshwater (particularly in South America); Atlantic, Indian, and Pacific. Dorsal fin long, with a deep notch separating spinous from soft portion; first with 6-13 spines, second with one spine and 20-35 soft rays; lateral line scales extend to the end of the caudal fin; caudal fin slightly emarginated to rounded; upper bony edge of opercle forked; single barbel or patch of small barbels on chin of some species; head with large cavernous canals (part of lateral line system); conspicuous pores on snout and lower jaw; swim bladder usually with many branches. Many are important food fishes. **Sciaenids can produce sound by using the swim bladder as a resonating chamber.** Many enter estuaries.

**Sparidae (porgies)** Marine (very rarely brackish and freshwater); Atlantic, Indian, and Pacific. Dorsal fin continuous, usually with 10-13 spines and 10-15 soft rays; anal fin with three spines and 8-14 soft rays; maxilla covered by a sheath when mouth closed; maximum length 1.2 m.