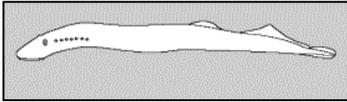


Characteristics of Common Families of Fishes



Petromyzontidae (Lampreys)

Derivation: Gr. petros = stone; myzo = to suck

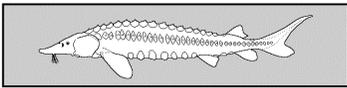
Refers to: Hanging to stones by sucking disk while spawning and ascending swift chutes

Characteristics:

- Absence of jaws
- Absence of paired fins
- Seven gill openings
- (Skeleton cartilagenous)

Distribution: mainly temperate zones of the world. Marine species anadromous.

Biology: Eel-like, jawless fish with cartilaginous skeleton and notochord. Pouch-like gills not supported by gill arches. No scales and no paired fins; 1-2 dorsal fins. Teeth on oral disc and tongue. Dorsal and ventral nerve roots separated. Nasohypophyseal sac has an external opening only. Intestinal tract with spiral valve and cilia. Sexes separate. Eggs numerous (thousands), small and not yolky, buried in spawning redds (egg beds) excavated in clean, hard bottoms (litophilous broodhiders). Parents die after spawning. Radical metamorphosis of ammocoete larvae in freshwater. Lampreys (together with hagfishes) are the most primitive extant vertebrates. Definite fossil records date back to the upper Carboniferous, about 280 million years ago. Members of Petromyzontinae have the highest number of chromosomes (164-174) among vertebrates. Larvae max 10 cm, adults max 120 cm. Parasitic or non-parasitic, the latter restricted to freshwater. Ammocoetes and adults are used as bait in some areas. A number of species are used as food.



Acipenseridae (Sturgeons)

Derivation: L. acipenser = a Latin name for the sturgeon;

L. penna = a wing or fin

Refers to: The latin name for a fish (sturgeon)

Characteristics:

- Five rows of bony scutes on the body
- Heterocercal tail
- Two pairs of barbels before inferior mouth
- (Skeleton cartilagenous)

Distribution: Cold to temperate waters of the Northern Hemisphere. Anadromous or restricted to freshwater.

Biology: Body with 5 rows of scutes. Mouth inferior and protractile. Four barbels anterior to mouth. Less than 50 gill rakers. Adults toothless. Large swim bladder. Attain 4.2 m or longer. Important for their meat and roe. Nearly all species are endangered or threatened.



Polyodontidae (Paddlefishes)

Derivation: Gr. poly = many; odontos = tooth

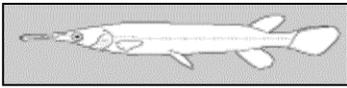
Refers to: Many fine deciduous teeth on jaws

Characteristics:

- Paddle shaped snout
- Heterocercal tail with a pronounced ventral lobe
- Scaleless except on tail
- (Skeleton cartilagenous)

Distribution: China and United States.

Biology: Snout resembling a paddle and with minute barbels. Body scaleless (naked) except for a few scales on caudal peduncle. Heterocercal caudal fin. Gill rakers long and numerous (hundreds) in the planktivorous Polyodon. Minute teeth. Spiracle present. Operculum greatly extended posteriorly. Two monotypic genera (Polyodon and Psephurus). Exhibited in public aquaria and used for food. Both species are under threat.



Lepisosteidae (Gars)

Derivation: Gr. lepism = scale; osteo = bone

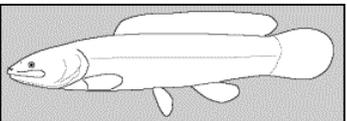
Refers to: Hard bony ganoid scales which are hinged to form a scale-like armor

Characteristics:

- Jaws and face extended into a pronounced beak
- Diamond-shaped ganoid scales covering the body

Distribution: Chiefly freshwater, in brackish water occasionally; very rarely marine. eastern North America (from southern Quebec) to Costa Rica; Cuba.

Biology: Body elongate. Jaws elongated, with needlelike teeth. Short heterocercal tail. Heavily armored with ganoid scales. Lateral line with about 50-65 scales. Dorsal fin far down posterior. Few dorsal rays. Branchiostegal rays 3. Gular or interopercle absent. Paired vomer. Vascularized swim bladder allows aerial respiration. Vertebrae convex anteriorly, concave posteriorly. About 3 m maximum length. Occurs usually in shallow, weedy areas.



Amiidae (Bowfin)

Derivation: Gr. amia = a Greek name for some kind of fish

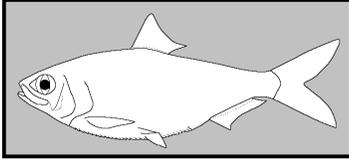
Refers to: The ancient name was applied to this fish

Characteristics:

- Long dorsal fin over most of the length of the back
- Bony plate on the under surface of the lower jaws

Distribution: Occurs only in North America, from the St. Lawrence River, Lake Champlain drainage of Quebec and Vermont west across southern Ontario to the Mississippi drainage in Minnesota.

Biology: Found on swampy, vegetated lakes of warm lakes and rivers. Air-breather that can withstand high temperatures which enables it to survive in stagnant areas. A voracious and opportunist feeder, it subsists on fishes including other sportfishes, frogs, crayfish, insects, shrimps, large amounts of vegetation. It uses scent as much as sight and captures food by means of gulping water. Males are always smaller than females which live longer. A lone survivor species of Family Amiidae. Max. size: 109.0 cm TL; max.weight: 9,750.0 g; max. reported age: 12 years Distribution: eastern North America. Short heterocercal caudal fin. Long dorsal fin base. About 48 dorsal rays. Large median gular plate. Branchiostegal rays 10-13. Swim bladder capable of respiratory function. Pyloric caeca absent. Maximum branchiostegal expansion and hyoid depression attained with closed jaws. About 90 cm maximum length.



Clupeidae (Herring and Shad)

Derivation: L. clupea = a Latin name for some small river fish

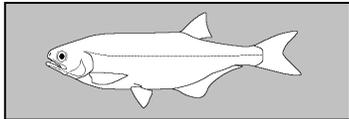
Refers to: The ancient name was applied to this fish

Characteristics:

- Dorsal fin inserted well forward of the anal fin
- Sharp scutes on the midline of the belly
- No teeth on the tongue and the mouth is small
- Lateral lines absent

Distribution: global (mostly tropical) from 70° N to about 60° S. Chiefly marine coastal and schooling fishes; some freshwater and anadromous.

Biology: Body usually fusiform, round to strongly compressed. Head without scales; jaw teeth, when present, are small or minute. A single dorsal fin, small and near midpoint of body; pelvic fins more or less below dorsal fin base; dorsal and pelvic fins absent in some species; soft rays only. Lateral line spanning a few scales behind the head in some species, missing in others; scales cycloid (smooth to touch); abdominal scutes usually present (a single pelvic scute in the Dussumieriinae). Branchiostegal rays usually 5-10. Most feed on small planktonic animals. Size range (adults): from 2 to 75 cm. One of the most important family of commercial fishes, processed for food, oil, or fish meal.



Hiodontidae (Mooneyes)

Derivation: Gr. hys = shaped like the Greek letter upsilon Ψ ;
odontos = tooth

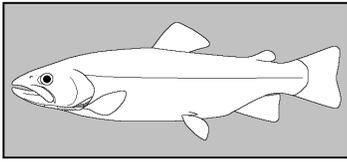
Refers to: The hyoid is a bone shaped like the letter Ψ , it forms the base of the tongue and bears teeth

Characteristics:

- Dorsal fin inserted approximately over anal fin (compare to Clupeidae)
- No sharp scutes on midline of belly
- Teeth on tongue and mouth well developed
- Lateral line present (compare to Clupeidae)

Distribution: North America.

Biology: Anal fin of moderate length and separate from caudal fin. Anal fin rays 22-23. Caudal fin well developed; forked. Distinct pelvic fins, with 7 rays. Branchiostegal rays 7-10. Subopercle present. About 54-61 scales in lateral line. Maximum length 50 cm.



Salmonidae (Salmon, Trout, Char)

Derivation: L. salmo = a Latin name for the salmon, originally from salio = to leap

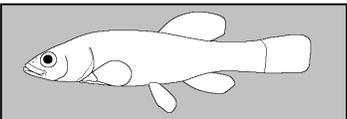
Refers to: The ability of salmon to leap in the air on spawning runs

Characteristics:

- Adipose fin
- Fine scales, more than 100 in lateral line
- Teeth on jaws well developed

Distribution: Northern Hemisphere, but widely introduced in cold waters for sports and aquaculture.

Biology: Many are anadromous, spending part of their life at sea, but returning to freshwater where all species spawn in a gravel bed in rivers or streams; most fish die after spawning. Small cycloid scales. Gill membranes reaching far forward, detached from isthmus. Axillary process on pelvics. Last three vertebrae directed upward. No spines. Adipose fin present. Attains 1.5 m (maybe 2 m) maximum length. Highly valuable in sport and commercial fisheries. There is disagreement about the status of some species and genera.



Umbridae (Mudminnows)

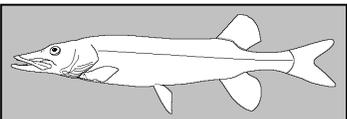
Derivation: L. umbra = a shade

Refers to: The few species in this family are all of a dark hue

Characteristics:

- Dark vertical bar at the base of the rounded caudal fin

Distribution: many areas above 20 deg. in the Northern Hemisphere. Rounded caudal fin. Caudal rays 20-30; 8-19 branched. Lateral line faint, if present. Pores in infraorbital canal 3 or less. Branchiostegal rays 5-8. No nasals. Vertebrae 32-42. Chromosome number very variable (22-78). Attains 20 cm maximum length.



Esocidae (Pickerel, Pike, Muskellunge)

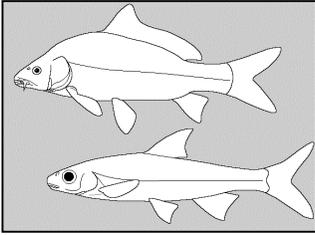
Derivation: L. esox = a Latin name for a kind of fish in the Rhine R.

Refers to: The ancient name applied to this fish

Characteristics:

- Jaws extend in duck-bill fashion
- Short dorsal fin inserted in far back on body
- Short sharp teeth

Distribution: Northern Hemisphere, colder parts of Eurasia and North America. Duckbill-like snout. Forked caudal fin; caudal rays 40-50, usually 17 branched rays; no spines. Many small cycloid scales. Complete lateral line. With at least 8 pores in infraorbital canal. Branchiostegal rays 10-20. Nasals present. With 43-67 vertebrae. To 1.8 m maximum length. Pikes are voracious predators, feeding on a wide variety of fishes and other vertebrates.



Cyprinidae (Minnows and Carps)

Derivation: Gr. kyprinos = ancient name for the carp

Refers to: The ancient name was applied to this fish

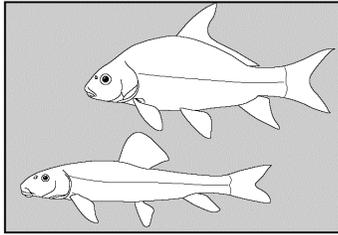
Characteristics:

- toothless jaws, but well developed pharyngeal teeth
- all fins without true spines
- head devoid of scales, rest of body covered by cycloid scales

Distribution: North America (northern Canada to southern Mexico), Africa, and Eurasia.

Biology: Pharynx with 1-3 rows of teeth, each row with a maximum of 8 teeth. Usually thin lips, plicae or papillae absent; mouth sometimes suckerlike (Garra and Labeo). With or without barbels.

Premaxilla usually borders the upper jaw making the maxilla entirely or almost entirely excluded from the gape. Usually protrusible upper jaw. Dorsal fin with spinelike rays in some. Primitive number of chromosomes $2n=50$, some with 48; polyploidy exists. Maximum length at least 2.5 m to probably 3 m in *Catlocarpio siamensis*; many species less than 5 cm. Mainly non-guarders, but in some species males build nests and/or protect the eggs.



Catostomidae (Suckers)

Derivation: Gr. kata = inferior; stoma = mouth

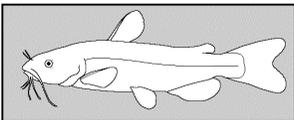
Refers to: The ancient name was applied to this fish

Characteristics:

- Similar to Cyprinids, but anal fin is positioned further back on caudal peduncle
- High dorsal ray count (almost always ≥ 10)
- Fleshy, protusible lips and premaxillaries
- Head devoid of scales, rest of body covered by cycloid scales

Distribution: China, northeast Siberia, North America.

Biology: Premaxilla and maxilla usually bordering upper jaw. Exhibits tetraploidy. About 1 m maximum length, usually below 60 cm.



Ictaluridae (Catfish and Bullheads)

Derivation: Gr. Ichthys = a fish; ailouros = a cat

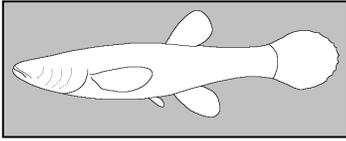
Refers to: The long barbels resembles a cat's whiskers

Characteristics:

- Four conspicuous pairs of barbels
- Wide mouth, with hundreds of minute teeth (often on roof of mouth)
- Scaleless body
- Adipose fin
- Venomous spines at the origins of the dorsal and pectoral fins***

Distribution: North America from southern Canada to Guatemala.

Biology: Dorsal soft rays usually 6. No palatine teeth. About 1.6 m maximum length attained in *Ictalurus furcatus* and *Pylodictis olivaris*. Three unrelated eyeless species are known from deep wells.



Amblyopsidae (Blind cave fish)

Derivation: Gr. amplys = blunt; ophis = appearance

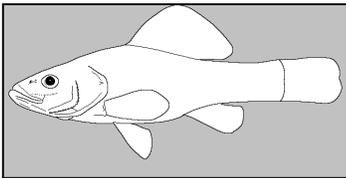
Refers to: The blunt appearance of the head of the fish

Characteristics:

- Eyes rudimentary and under the skin
- Scattered embedded scales, appears naked and white
- Anus under the throat

Distribution: Southern and eastern United States.

Biology: Scales cycloid. Head naked. Eyes small to vestigial. Dorsal fin spines 1-2 or absent; soft rays 7-12. Anal fin spines 1-2 or absent; soft rays 7-11. Usually without pelvic fins; *Amblyopsis spelaea* has small abdominal pelvic fins with 0-6 rays. Rows of sensory papillae on the head, body, and tail. Vertebrae 27-35. About 9 cm maximum length.



Aphredoderidae (Pirate perches)

Derivation: Gr. aphodos = excrement; dere = throat

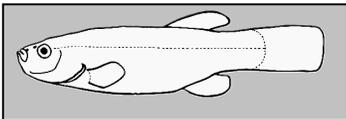
Refers to: The position of the vent which is located in the throat

Characteristics:

- One dorsal fin with 3-4 short spines
- Preopercle serrated; opercle with a spine
- Anus located under the throat

Distribution: Eastern United States.

Biology: Scales ctenoid. Head scaly on sides. Normal eyes. Dorsal fin spines 3 or 4; soft rays 10 or 11. Anal fin spines 2 or 3; soft rays 5-7. Pelvic fin insertion subthoracic; pelvic rays 7. Anus in juveniles immediately preceding anal fin, moving anteriorly with growth. That young individuals have less anal fin spines (2) but more soft rays (8) while adults have 3 and 7, respectively, seems to result from a transformation of the third soft ray into a spine. About 13 cm maximum length.



Cyprinodontidae (Killifishes)

Derivation: Gr. kyprinos = carp; odontos = tooth

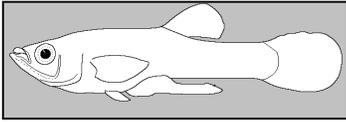
Refers to: Literally the toothed carp; resembles the cyprinids but with teeth on the jaws

Characteristics:

- Mouth opens on the upper aspect of the flattened head
- Vertical barring on the body

Distribution: United States, Middle America, West Indies, parts of northern South America, northern Africa, and Mediterranean Anatolian region. Chiefly freshwater and brackish; rarely coastal marine.

Biology: Egg-laying. Males without gonopodium (external fertilization). Dorsal processes of maxillaries expanded medially, nearly meeting in the midline; lateral arm of maxilla expanded. About 22 cm maximum length.



Poeciliidae (Livebearers)

Derivation: Gr. poikilias = (poikilos = many colored)

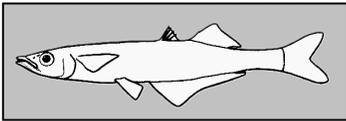
Refers to: The ancient name applied to this fish

Characteristics:

- Mouth open on the upper aspect of the flattened head
- No vertical bars on body
- Elongated anal fin on the males; females with a large black gravid spot on the abdomen
- Viviparous

Distribution: Low altitudes from eastern United States to northeastern Argentina; also in Africa and Madagascar. Reported to occur in salt waters in coastal areas.

Biology: Pectoral fins placed high on side of body; anterior placement of pelvic fins; pleural ribs on the first several haemal arches; ventral hyphryal forms a bony cap over the anterior facet of the anterior ceratohyal; supraorbital pores modified such that neuromasts are found embedded in fleshy grooves. Gonopodium present or absent. 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. The Fluviophylacine and the Aplocheilichthyinae that were formerly placed in the Cyprinodontidae are now placed here, thus changing the livebearers to subfamily rank Poeciliinae.



Atherinidae (Silversides)

Derivation: Gr. atherine = the ancient name for a kind of smelt; ather = spear or spike

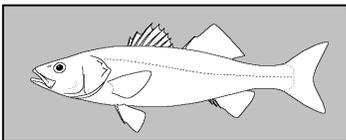
Refers to: The shape of this fish resembles a spear or spike

Characteristics:

- Semi-translucent body
- Two dorsal fins; the first with soft flexible spines, the second with soft spines

Distribution: tropical to temperate waters.

Biology: Two widely separated dorsal fins, the first with flexible spines and the second with one spine followed by soft rays; anal fin with one spine followed by soft rays; pectoral fins high on body; mouth small and terminal; no lateral line; broad silvery lateral band (black in preserved specimens); pelvic fins usually abdominal; scales relatively large (usually 31-50 in lateral series, more in Labidesthes); vertebrae 32-60 (fewer in Stenatherina). Reported maximum length 60 cm. Most species are marine. However, there are about 50 species confined to freshwater and others that enter freshwater. Feed on zooplankton.



Moronidae (Temperate basses)

Derivation: Gr. moron = stupid, foolish

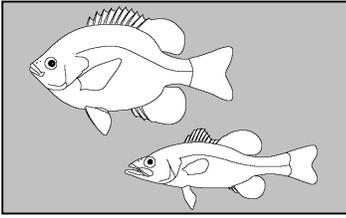
Refers to: ?

Characteristics:

- Preopercle serrated; opercle with 1 or 2 spines
- Three anal spines
- Usually horizontally striped

Distribution: North America (Atlantic and Gulf of Mexico drainages, introduced elsewhere), Europe, and northern Africa. Coastal areas.

Biology: 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. Auxillary row of lateral line scales on the caudal fin above and below the main row. Branchiostegal rays 7. Vertebrae 25.



Centrarchidae (Sunfish)

Derivation: Gr. kentron = a spine; archos = rectum or anus

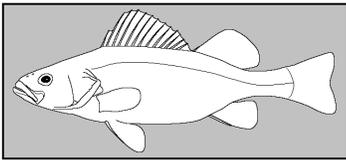
Refers to: The development of the anal spines

Characteristics:

- Single dorsal fin incl. both spinous and soft rays (over 5 spines)
- Three or more anal spines
- Lateral line complete

Distribution: North America.

Biology: 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. Introduced into many areas outside native range.



Percidae (Perch and darters)

Derivation: Gr. perke = a kind of fish, the perch

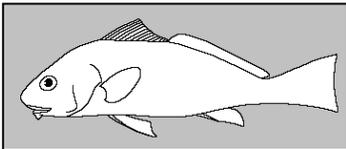
Refers to: The ancient name was applied to this fish

Characteristics:

- Two distinct dorsal fins; first spiny rayed, the second soft rayed
- One or two anal spines
- Anal papilla developed

Distribution: Northern Hemisphere.

Biology: 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.



Sciaenidae (Drum)

Derivation: Gr. skiaina = an ancient name of a sea fish

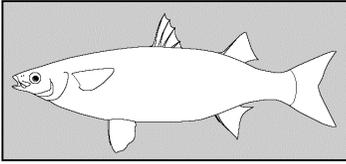
Refers to: The ancient name was applied to this fish

Characteristics:

- Single dorsal fin including both spinous and soft rays
- Complete lateral line extending onto caudal fin
- One or two anal spines

Distribution: Atlantic, Indian and Pacific.

Biology: Dorsal fin long, having a deep notch between the spinous and soft-rayed parts, but the parts rarely separate. Spinous part with 6-13 spines; the soft-rayed part with 1 spine and usually 20-35 soft rays. Anal fin having 1 or 2 usually weak spines; soft rays 6-13. Lateral line reaching end of caudal fin. Slightly emarginate to rounded caudal fin. Opercle with the upper bony edge forked. Gill opening with a bony flap above it. Some species with 1 barbel or a patch of small barbels on chin. Large cavernous canals in head. Snout and lower jaw with conspicuous pores. Vomer and palatine toothless. Swim bladder usually having many branches and used as a resonating chamber. Exceptionally large otoliths. Vertebrae 24-29. Bottom dwelling carnivores, feeding on benthic invertebrates and small fishes. Juveniles are popular aquarium fishes, but difficult to maintain.



Mugilidae (Mulletts)

Derivation: L. mugil = a sort of fish

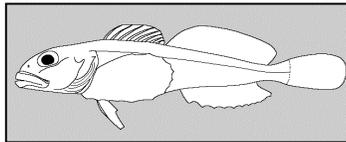
Refers to: The ancient name was applied to this fish

Characteristics:

- A small weak mouth; pectorals high on the sides of the body
- A small four spined dorsal fin considerably in advance of the soft portion
- May bear conspicuous adipose membranes over their eyes

Distribution: All tropical and temperate seas. Chiefly marine (coastal) and brackish water; some in freshwater.

Biology: Spinous (4 spines) and soft dorsal fins widely separated. Pelvic fins subabdominal; 1 spine, 5 soft rays. 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. Maximum length about 90 cm. Travel in schools and feed on fine algae, diatoms, and detritus of bottom sediments. Important food fishes.



Cottidae

Derivation: L. mugil = a sort of fish

Refers to: The ancient name was applied to this fish

Characteristics:

- A small weak mouth
- Pectorals high on the sides of the body
- A small four spined dorsal fin considerably in advance of soft portion
- May bear conspicuous adipose membranes over eyes

Distribution: Northern Hemisphere and near New Zealand.

Biology: Body often appears naked, commonly bearing scales or prickles; eye usually large, located high on the head. Lateral line one. One spine on pelvic fin and 2-5 soft rays. Anal fin lacking spines. No swim bladder in adults. Reaches about 78 cm maximum length in *Scorpaenichthys marmoratus*.