

GAIDROPSARIDAE

Rocklings

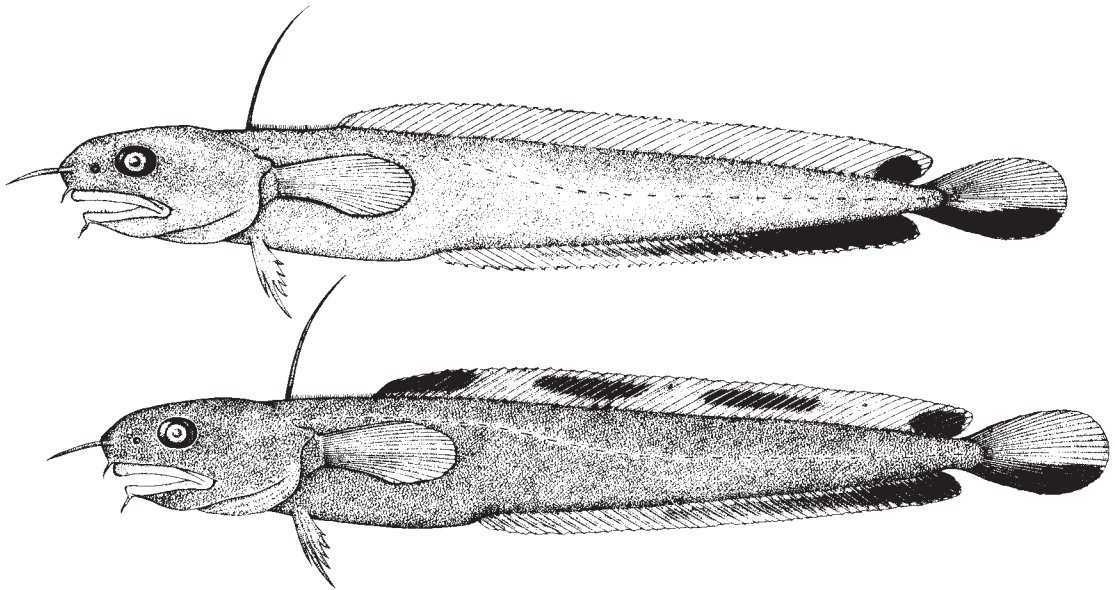
by T. Iwamoto, California Academy of Sciences, USA and D.M. Cohen, Bodega Bay, California, USA

A single species occurring in the area.

Enchelyopus cimbrius (Linnaeus, 1766)

ENC

FAO names: En - Fourbeard rockling; Fr - Motelle à quatre barbillons.



Diagnostic characters: Body elongated, cylindrical; caudal peduncle moderately deep. Mouth slightly underslung, lower jaw shorter than upper jaw; **4 barbels, one at each anterior nostril, one at tip of snout, one on chin. Dorsal fin in 3 parts, first part a single, thickened, unsegmented ray, second part a low fleshy ridge of unsegmented rays in a shallow groove, third part long-based with 45 to 52 segmented rays;** anal fin long-based with straight distal margin; caudal and pectoral fins well developed, with rounded margins; pelvic fins thoracic with 5 to 7 soft rays. **Colour:** variable, olive to brown dorsally, pale ventrally, generally paler in northern latitudes; median fins with prominent black blotches in some specimens; juveniles silvery.

Similar families occurring in the area

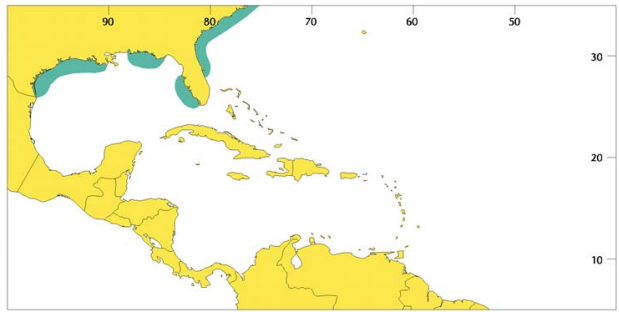
Rocklings are alone among gadoids in having barbels on the snout and a peculiar dorsal fin arrangement, with first part composed of a single ray, the second a series of short fleshy filaments in a groove, and the third a long section of normal, segmented rays with a straight, unindented margin.

Size: Maximum to about 41 cm, usual size less than 30 cm.

Habitat, biology, and fisheries: Adults benthic, sedentary on mud or soft bottoms on continental slope, and often in shallow waters near shore, juveniles pelagic; depth range about 20 m to 650 m. Possibly migrates to shallower waters in autumn and winter, then back to deeper waters in spring and summer. Spawning season prolonged, from January through September, duration varying with area. Growth slow, about 15 cm at 3 years, 20 cm at 5 years, 25 cm at 7 years, and 29 to 30 cm at 9 years. Feeds primarily on crustaceans, less often on fish. Incidentally caught in trawl fisheries, but of little or no commercial value.

Distribution: North Atlantic, from northern Gulf of Mexico to Greenland in west, Iceland and northern Europe to Bay of Biscay and Mauritania in the east.

Remarks: Family composed of only 3 genera, *Ciliata* (2 spp.), *Enchelyopus* (1 sp.), and *Gaidropsarus* (about 13 spp.), only 1 species in the area. Family often included as subfamily of Phycidae or Gadidae.



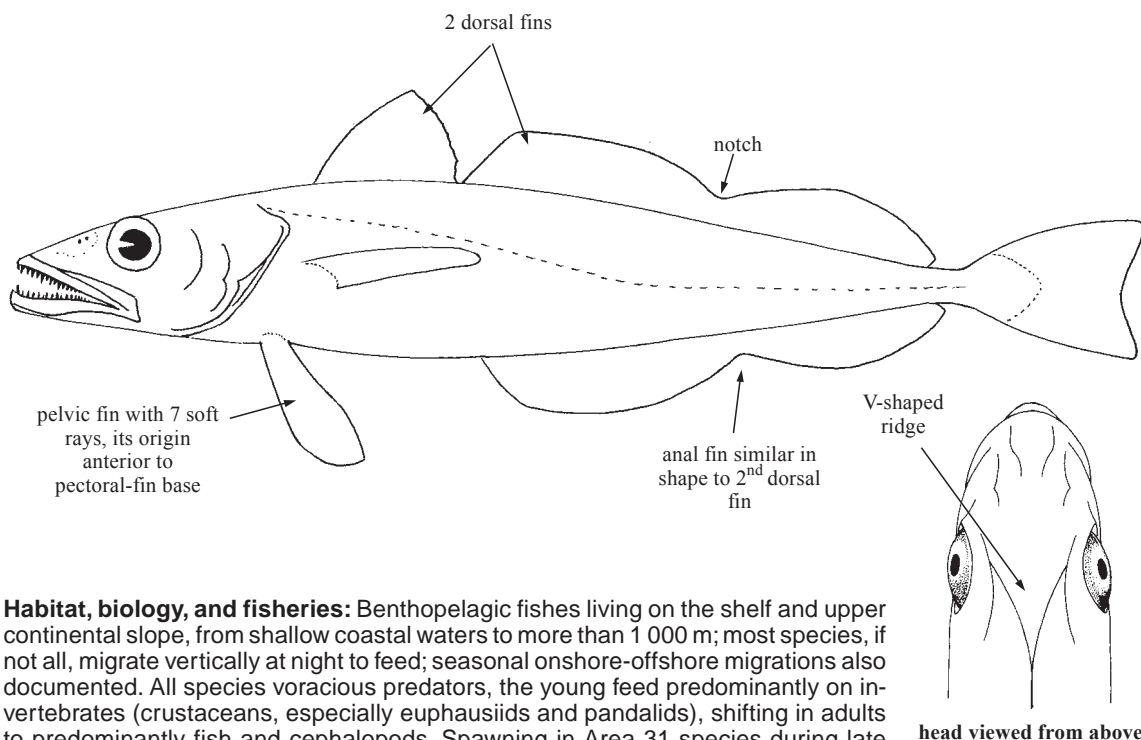
References

- Cohen, D.M. 1990. Family Gadidae. In FAO species catalogue. Vol. 10. Gadiform fishes of the world (order Gadiformes). An annotated and illustrated catalogue of cods, hakes, grenadiers and other gadiform fishes known to date, edited by D.M. Cohen, T. Inada, T. Iwamoto, and N. Scialabba. *FAO Fish. Synop.*, (125)Vol.10:442 p.
- Cohen, D.M. and J.L. Russo. 1979. Variation in the fourbeard rockling, *Enchelyopus cimbrius*, a North Atlantic gadid fish, with comments on the genera of rocklings. *Fish. Bull. (U.S.)*, 77(1):91-102.

MERLUCCIIDAE**Merlucciid hakes**

by T. Iwamoto, California Academy of Sciences, USA and D.M. Cohen, Bodega Bay, California, USA

Diagnostic characters: Medium-sized (to about 80 cm in Area 31, >140 cm in other areas) with elongated body, rounded anteriorly, becoming laterally compressed posteriorly. **Head somewhat flattened on top, its length 3.5 to 4.5 times into total length; a low, v-shaped ridge on top of head.** Mouth large, terminal, jaws almost half length of head, **lower jaw slightly protruding. Jaw teeth well developed, pointed, in 2 irregular series;** teeth on vomer, none on palatines. **Two dorsal fins, the first short-based and triangular, the second long-based and notched near midlength;** anal fin similar in length and shape to second dorsal fin; **caudal fin well developed, weakly forked; pectoral fin extends to over anus, upper edge of base at midbody depth; pelvic fin with 7 soft rays, its origin anterior to pectoral-fin base. Colour:** usually silvery when alive, steel greyish on back, lighter on sides, silvery white on belly.



Habitat, biology, and fisheries: Benthopelagic fishes living on the shelf and upper continental slope, from shallow coastal waters to more than 1 000 m; most species, if not all, migrate vertically at night to feed; seasonal onshore-offshore migrations also documented. All species voracious predators, the young feed predominantly on invertebrates (crustaceans, especially euphausiids and pandalids), shifting in adults to predominantly fish and cephalopods. Spawning in Area 31 species during late spring through summer and autumn; eggs pelagic, young develop rapidly, females live longer and become larger than males. Species in temperate waters generally grow larger than warmer-water species and form important commercial fisheries, but almost all of some commercial importance. In Area 31, offshore hake fishery insignificant (mostly bycatch of bottom trawlers) and silver hake fishery almost entirely north of area. Marketed fresh, frozen, smoked, or used as fish meal. Flesh white, flaky, and low in fat.

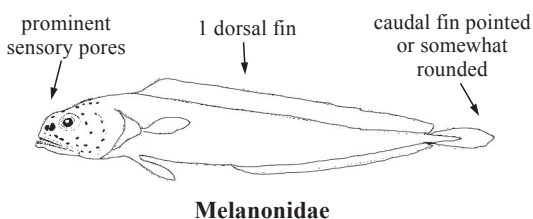
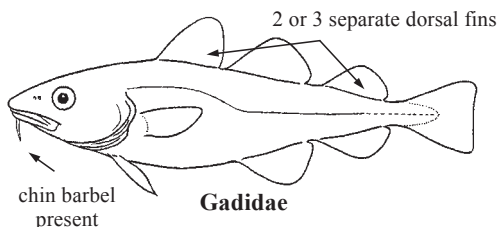
Remarks: Thirteen species, only 2 in the area. Merlucciidae sometimes treated as subfamily of Gadidae. Steindachneriidae (*Steindachneria*) and Macruroninae (*Macruronus*, *Lyconodes* and *Lyconus*) considered by some as subfamilies, but here treated as full families, following Nelson (1994).

Similar families occurring in the area

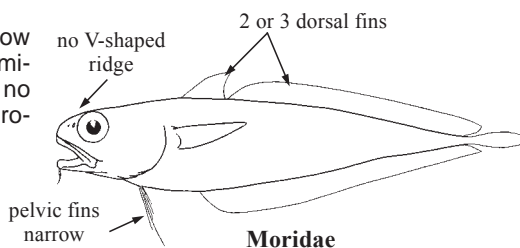
Merlucciids can be distinguished from all other gadoids in having the combination of 2 dorsal fins, both second dorsal and anal fins long-based and notched at midlength, the caudal fin well developed, the pelvic fins normally developed, the mouth large, with lower jaw slightly protruding, and no chin barbel.

Gadidae: 2 or 3 separate dorsal fins, 1 or 2 anal fins, chin barbel present.

Melanonidae: small (about 25 cm) mesopelagic or bathypelagic fishes with 1 long-based dorsal fin; one long-based anal fin; caudal fin pointed or with somewhat rounded margin; colour usually blackish; prominent sensory pores and ridgelike rows of free neuromasts on head.



Moridae: 2 or 3 dorsal fins, 1 or 2 anal fins, pelvic fins narrow with filamentous tips in some species; mouth inferior or terminal; chin barbel in many; teeth few or lacking on vomer; no v-shaped ridge on top of skull; swimbladder with anterior projections that connect to rear of skull.



Key to the species of Merlucciidae occurring in the area

- 1a. Total number of gill rakers on first arch fewer than 13; second dorsal fin with 35 to 39 soft rays *Merluccius albidus*
- 1b. Total number of gill rakers on first arch more than 16 to 20; second dorsal fin with 37 to 42 soft rays *Merluccius bilinearis*

List of species occurring in the area

The symbol is given when species accounts are included.

- Merluccius albidus* (Mitchill, 1818).
- Merluccius bilinearis* (Mitchill, 1814).

References

Inada, T. 1981. Studies on the merlucciid fishes. *Bull. Far Seas Fish. Res. Lab. Shimizu*, (18):1-172.

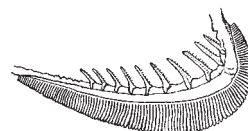
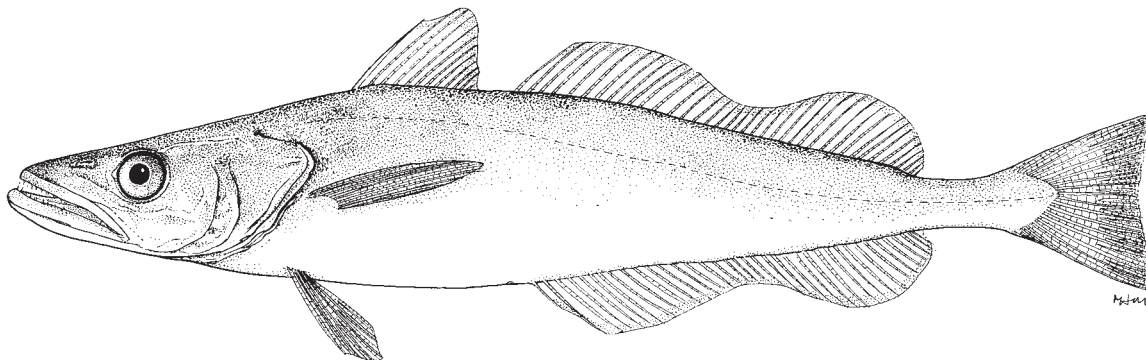
D.M. Cohen, T. Inada, T. Iwamoto, and N. Scialabba. 1990. FAO Species Catalogue. Vol. 10. Gadiform fishes of the world (order Gadiformes). An annotated and illustrated catalogue of cods, hakes, grenadiers and other gadiform fishes known to date. *FAO Fish. Synop.* 10(125):442 p.

Merluccius albidus (Mitchill, 1818)

HOF

Frequent synonyms / misidentifications: *Merluccius magnoculus* Ginsburg, 1954 / *M. bilinearis* (Mitchill, 1814).

FAO names: En - Offshore silver hake; Fr - Merlu argenté du large; Sp - Merluza blanca de altura.



first gill arch

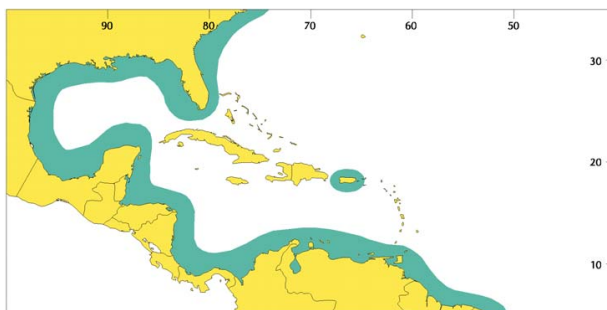
Diagnostic characters: Head 27 to 32% of standard length; gill rakers short and thick, with blunt tips, total number on first arch 8 to 11. Second dorsal fin with 35 to 39 soft rays; anal fin with 35 to 41 soft rays. Scales moderately large, 104 to 119 on lateral line. Total number of vertebrae 51 to 55. **Colour:** greyish to brownish dorsally, remaining areas silvery white.

Size: Males to about 40 cm, females to 70 cm.

Habitat, biology, and fisheries: Primarily a near-bottom inhabitant of shelf and upper continental slope waters; males and young females inhabit depths between 80 and 550 m, mature females occur deeper than 550 m, to maximum of 1 170 m. Fish, squid, and crustaceans compose the major part of the diet; spawning takes place from spring to early autumn on or near bottom at around 330 to 550 m; females live longer than males (at least 5 years, compared to 3 years in males) and are much larger. The offshore hake is of minor interest to fisheries; it is taken as a bycatch of the silver hake (trawl) fishery in the New England states; a small, potential commercial resource exists in the Gulf of Mexico; marketed fresh, frozen, and smoked.

Distribution: Widespread in western central Atlantic, from Georges Bank off Maine to Rio de Janeiro, Brazil, and throughout Gulf of Mexico and Caribbean Sea.

Remarks: Range in the north overlaps with that of commercially important silver hake, but offshore hake generally found in deeper waters. The fewer gill rakers and larger head distinguish offshore hake from silver hake.

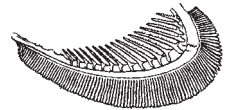
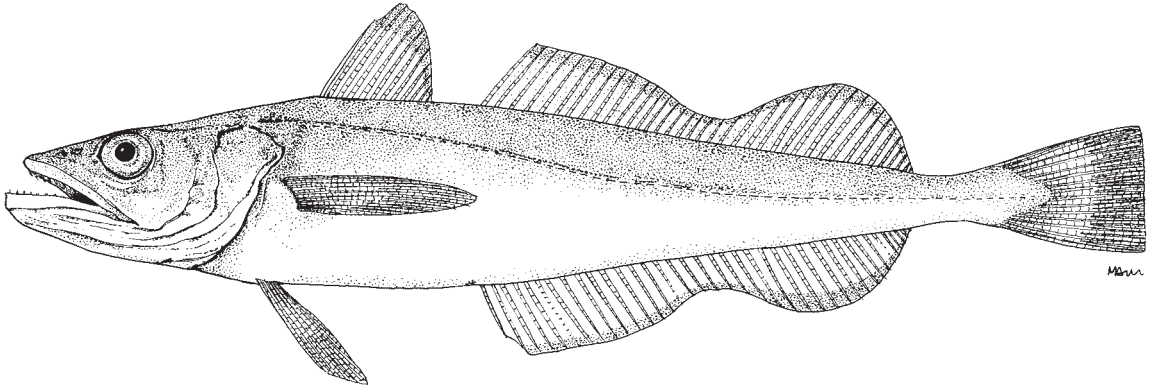


Merluccius bilinearis (Mitchill, 1814)

HKS

Frequent synonyms / misidentifications: None / *Merluccius merluccius* (Linnaeus, 1758), *M. albidus* (Mitchill, 1818)

FAO names: **En** - Silver hake; **Fr** - Merlu argenté; **Sp** - Merluza norteamericana.



first gill arch

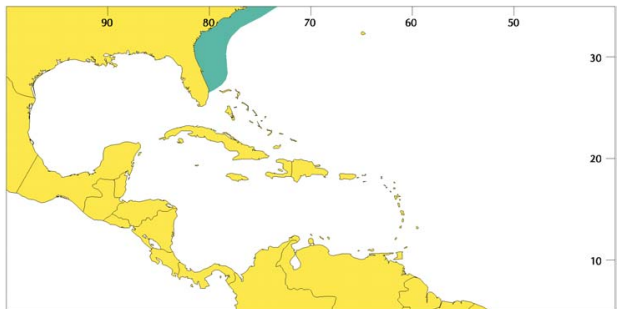
Diagnostic characters: Head length 24 to 27% of standard length; gill rakers long and pointed, 16 to 20 total on first arch. Second dorsal fin with 37 to 42 soft rays; anal fin with 37 to 42 soft rays. Scale rows 101 to 110 on lateral line. Total number of vertebrae 26 to 29. **Colour:** greyish dorsally, remaining areas silvery white.

Size: Maximum length about 76 cm.

Habitat, biology, and fisheries: Inhabits continental shelf depths from about 55 to 300 m, but also found in upper-slope waters to more than 900 m; occasionally strays into shallow coastal waters; seasonally migrates to shallower waters during warmer months, to deeper offshore waters in winter. Young of 1 to 3 years feed primarily on invertebrates (mostly crustaceans, especially euphausiids and pandalids); older fish feed mostly on fish and cephalopods; cannibalism significant and may regulate population of species. Spawning occurs in summer and early autumn and is highly dependent on water temperature. An important commercial fish in Area 21, but not found in significant quantities in Area 31. Marketed fresh, frozen, and smoked.

Distribution: Atlantic coast of North America from Florida to Newfoundland.

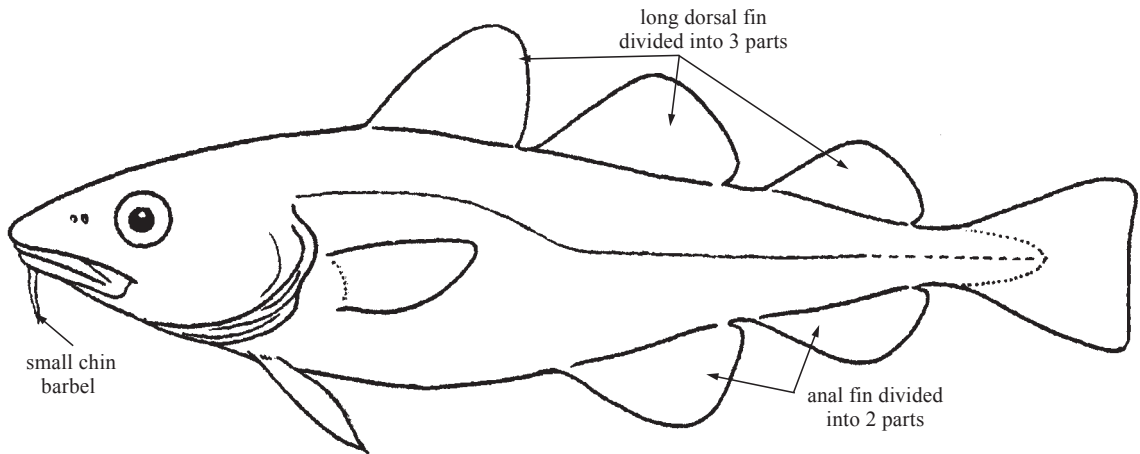
Remarks: Catch statistics may include mixture of silver and offshore hakes.



GADIDAE**True cods**

by T. Iwamoto, California Academy of Sciences, USA and D.M. Cohen, Bodega Bay, California, USA

Diagnostic characters: Large fish to 2 m, commonly from 30 to 100 cm, with elongated body and moderately deep caudal peduncle. Top of head lacking V-shaped ridge. Mouth large with either upper jaw or lower jaw slightly protruding in many; teeth on vomer; **small chin barbel present** in most species. **Long dorsal fin divided into 3 parts; anal fin in 2 parts;** caudal fin well developed, truncate to forked; pectoral fins well developed, pointed; **pelvic fins short, thoracic.** **Colour:** variable, usually brownish to olive, or greyish to bluish dorsally, somewhat paler ventrally, belly often white, grey, or yellowish.



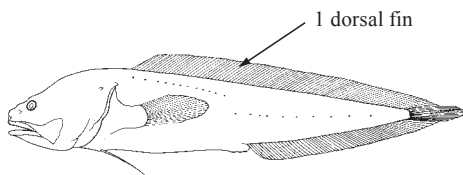
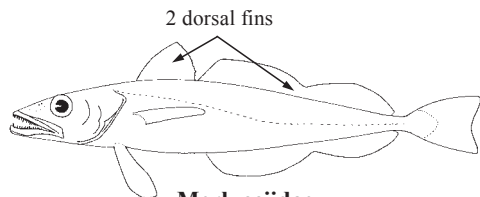
Habitat, biology, and fisheries: Most species confined to cold temperate to Arctic waters of North Atlantic and North Pacific, with few species in southern hemisphere. Most live on or near bottom (a few species pelagic) over continental shelf from nearshore to far offshore, but some occur at depths of 600 m or more; early-life stages pelagic, juveniles of some species found in estuaries and shallow coastal waters. Seasonal inshore-offshore migrations common, some undergo extensive north-south migrations. Fecundity in most species high, depending on size of individual; spawning occurs in colder months, usually from late autumn to spring, depending on locality and water temperature. Most species voracious and omnivorous predators; food preferences include, but not limited to, fish, shrimp, crabs, squid, and various bottom invertebrates. Of little or no significance to fisheries.

Remarks: Gadidae often treated (especially in older literature) as including several other groups, notably rocklings, cuskfishes, phycid hakes, and merlucciid hakes, all of which are here treated as of family rank. Gadidae include about 25 species in 12 genera, but only 3 species are found in the area, and those are only marginally present at the northern border.

Similar families occurring in the area

Bythitidae: 1 long-based dorsal fin; anterior nostril immediately above upper lip in most; viviparous, males with an external intromittent organ.

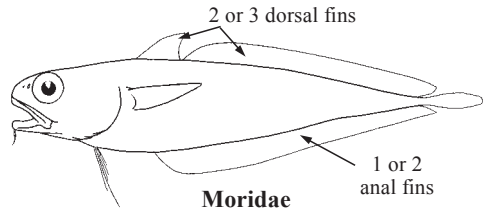
Merlucciidae: 2 dorsal fins, 1 anal fin, the second dorsal and anal fins similar in size and shape, with notch in middle; V-shaped crest on top of head; no chin barbel.

**Bythitidae****Merlucciidae**

Moridae: 2 or 3 dorsal fins, 1 or 2 anal fins, pelvic fins narrow with filamentous tips in some species, more normal in shape in other species; teeth few or lacking on vomer; swimbladder with 2 anterior projections that connect to rear of skull.

Ophidiidae: 1 long-based dorsal fin; caudal fin connected with dorsal and anal fins; pelvic fins with 0 to 2 rays, bases close together without a broad scaled space between.

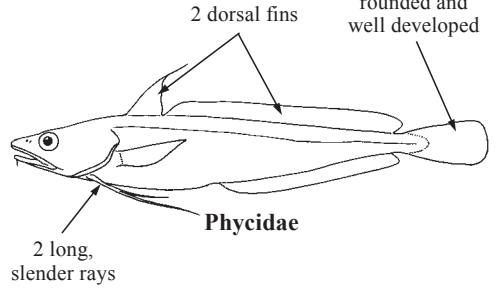
Phycidae: teeth on vomer well developed; no connection of swimbladder to back of skull; caudal peduncle relatively deep; pelvic fin consists of 2 long, slender, feeler-like rays, the longest extending close to or beyond vent; no light organ.



Moridae

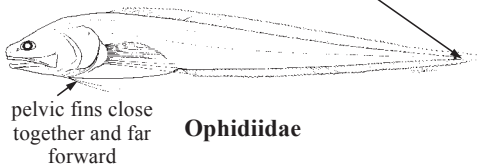
1 or 2 anal fins

caudal fin rounded and well developed



Phycidae

caudal fin continuous with dorsal and anal fins



Ophidiidae

Key to the species of Gadidae occurring in the area

1a. First anal fin with long base, 1/2 or more of preanal distance; lower jaw slightly longer than upper jaw; chin barbel very small or absent → 2

1b. First anal fin short-based, less than 1/2 preanal distance; lower jaw slightly shorter than upper jaw; chin barbel large (Fig. 1) *Gadus morhua*

2a. Dorsal fins widely separated, space between second dorsal fin and third dorsal fin greater than length of base of first dorsal fin; chin barbel absent (Fig. 2) *Micromesistius putassou*

2b. Dorsal fins closer together, space between second dorsal fin and third dorsal fin less than length of base of first dorsal fin; a small chin barbel usually present in young (Fig. 3) *Pollachius virens*

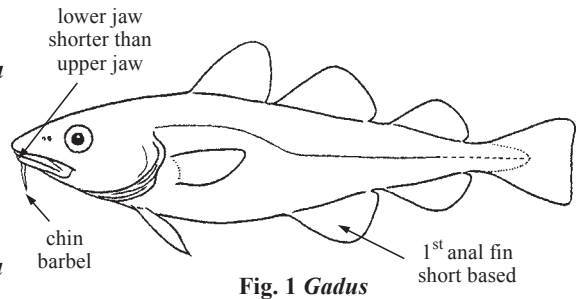


Fig. 1 Gadus

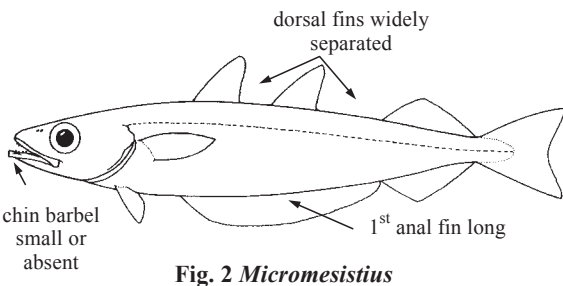


Fig. 2 Micromesistius

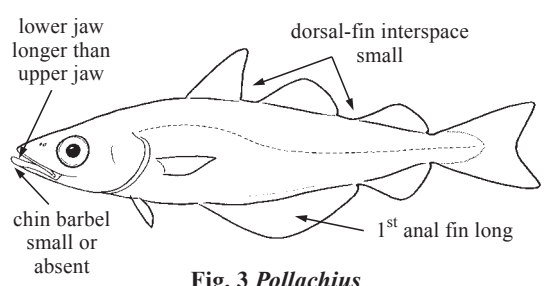



Fig. 3 Pollachius

List of species occurring in the area

The symbol  is given when species accounts are included.

 *Gadus morhua* Linnaeus, 1758.

 *Micromesistius poutassou* (Risso, 1827).

 *Pollachius virens* (Linnaeus, 1758) .

References

Bigelow, H.B. and W.C. Schroeder. 1953. Fishes of the Gulf of Maine. *U.S. Fish & Wildl. Serv. Fish. Bull.*, 53:1-577.

Cohen, D.M., T. Inada, T. Iwamoto, and N. Scialabba. 1990. FAO species catalogue. Vol. 10. Gadiform fishes of the world (order Gadiformes). An annotated and illustrated catalogue of cods, hakes, grenadiers and other gadiform fishes known to date. *FAO Fish. Synop.*, (125)Vol.10:442 p.

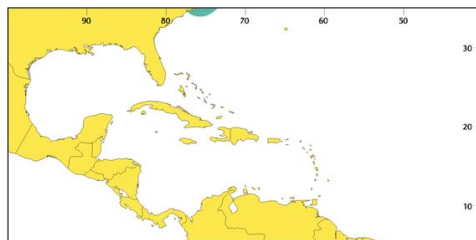
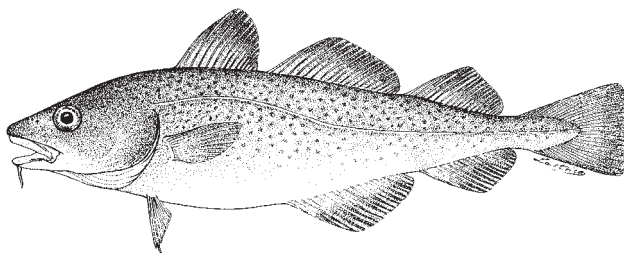
Liem, A.H. and W.B. Scott. 1966. Fishes of the Atlantic coast of Canada. *Fish. Res. Bd. Can. Bull.*, (155):485 p.

Gadus morhua Linnaeus, 1758

COD

En - Atlantic cod; **Fr** - Morue de l'Atlantique; **Sp** - Bacalao del Atlántico.

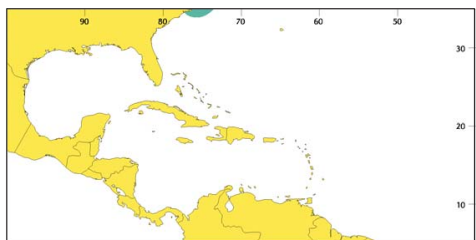
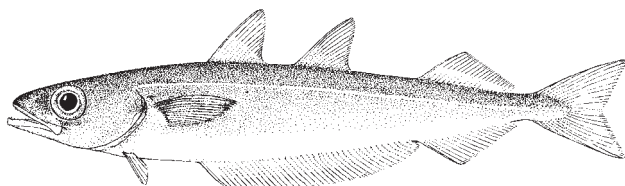
Maximum size to 2 m and about 90 kg, but average size only around 60 cm with weights averaging about 2 to 3 kg in western Atlantic. Primarily demersal, but becoming pelagic when feeding and spawning; found mostly over continental shelf in 150 to 200 m, but recorded to much greater depths (over 600 m). Prefers cold waters of 0 to 5 C, but found in waters as warm as 15 C. A species of considerable economic importance, but stocks in western Atlantic severely depleted and commercial harvest for the most part curtailed. Marketed fresh, frozen, dried, salted, and smoked. A boreal North Atlantic species ranging from North Carolina to Greenland, Iceland, across northern Europe, into Barents Sea including Novaya Zemlya and Spitzbergen; uncommon south of New York and New Jersey and of no commercial importance in Area 31.

***Micromesistius poutassou*** (Risso, 1827)

WHB

En - Blue whiting; **Fr** - Merlan bleu; **Sp** - Bacaladilla.

Maximum size 50 cm, commonly from 15 to 30 cm. Oceanic and benthopelagic in habit at depths of 150 to more than 1 000 m, but more common at 300 to 400 m. Undergoes vertical and seasonal migrations. Feeds primarily on small crustaceans, but also on small fish and cephalopods. Ranges in North Atlantic from Barents Sea south to northern Africa, into Mediterranean, off Iceland and Greenland, and off southeastern coast of Canada and northeastern USA to about Cape Hatteras. Marketed fresh, frozen, and rendered into fish meal and oil. Uncommon south of Cape Hatteras and not of commercial importance in Area 31.



Pollachius virens (Linnaeus, 1758)

POK

En - Saithe (AFS: Pollock); **Fr** - Lieu noir; **Sp** - Carbonero.

Maximum size to 130 cm; commonly to 100 cm. Occurs pelagically in inshore and offshore waters to about 200 m. Active swimmers, gregarious; migrates inshore in spring, offshore in winter, also known to migrate long distances north-south. Voracious feeders; young feed primarily on invertebrates (especially crustaceans), the adults on fish. Important commercial trawl and sports fish in New England states and northern Europe, but occurrence only incidental in Area 31, at southern end of range (North Carolina). Marketed fresh, salted, dried, smoked and canned. North Atlantic in polar and temperate marine waters, North Carolina to Greenland, Iceland, Spitzbergen, and northern Europe south to Bay of Biscay.

