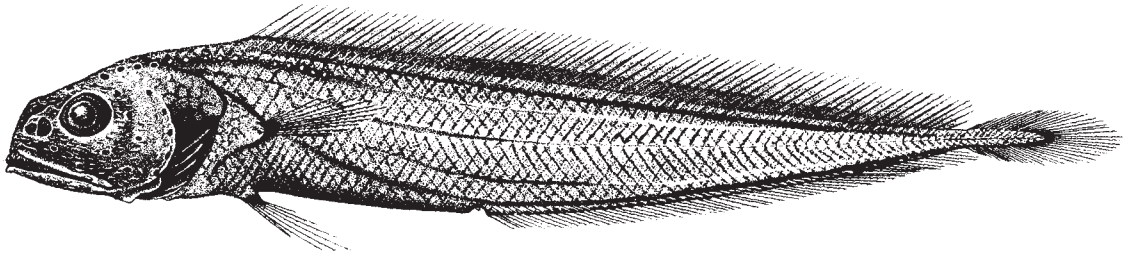
MELANONIDAE

Pelagic cods

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

Melanonus zugmayeri Norman, 1930

En - Tropical pelagic cod.

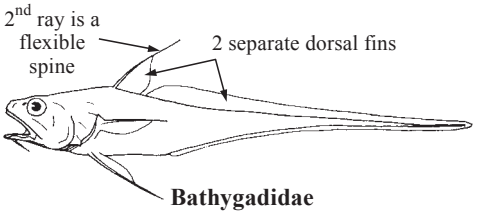


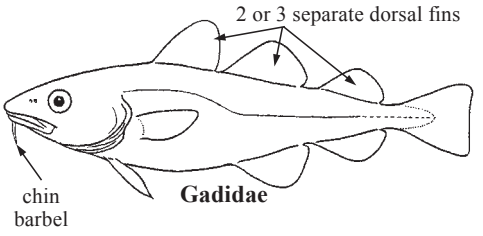
Diagnostic characters: Body slender, tapering to a narrow caudal peduncle. Head covered with free neuromasts aligned longitudinally into short ridges; pores of sensory lateralis system on head large, prominent; mouth large; teeth in 2 or 3 series in jaws, **inner series laterally in lower jaw large, canine-like, widely spaced; teeth on vomer and palatines**; no chin barbel. **One long-based dorsal fin, high anteriorly, slightly notched at about sixth to tenth ray; anal fin long-based, rays finer than opposites of dorsal fin; caudal fin poorly developed, narrow, rounded to somewhat pointed**; pectoral fin midlateral, below origin of dorsal fin; pelvic fin with 7 rays, origin anterior to pectoral base. **Colour:** overall blackish.

Similar families occurring in the area

Bathygadidae: no caudal fin; no teeth on roof of mouth; 2 separate dorsal fins, second ray of first dorsal fin a flexible spine, slightly to extremely prolonged.

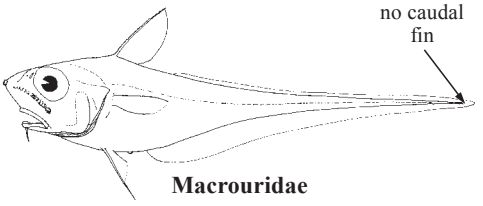
Gadidae: 2 or 3 separate dorsal fins; 1 or 2 anal fins; chin barbel present.

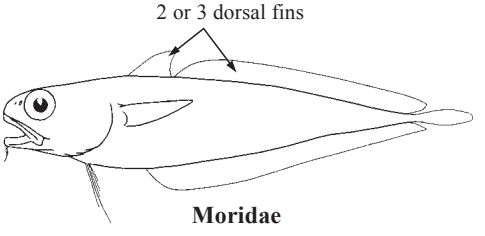




Macrouridae: no caudal fin; no teeth on roof of mouth; scales usually covered with spinules.

Moridae: 2 or 3 dorsal fins, 1or 2 anal fins, pelvic fins narrow with filamentous tips in some species; chin barbel developed in many; no enlarged, canine-like teeth in lower jaw, few or no teeth on vomer; swimbladder with anterior projections that connect to rear of skull.



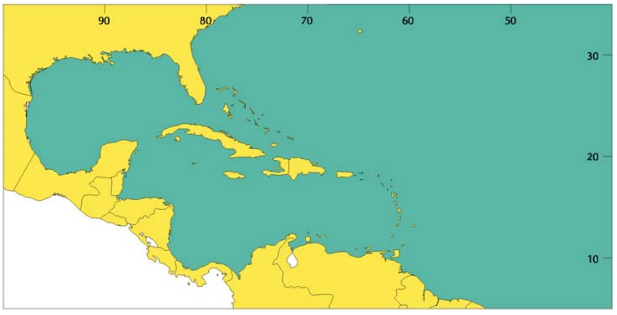


Size: Maximum to about 25 cm, more commonly between 10 and 15 cm.

Habitat, biology, and fisheries: Mesopelagic to bathypelagic, inhabiting temperate to tropical waters. Of no commercial value.

Distribution: Apparently circumglobal in temperate to tropical waters.

Remarks: Uncommon, only 2 species, 1 found in area, the other with subantarctic distribution.



References

Cohen, D.M. 1986. Family Melanonidae. In *Smith's Sea Fishes*, edited by M.M. Smith and P.C. Heemstra. Johannesburg, South Africa, Macmillan, 1047 p.

Cohen, D.M. 1990. Melanonidae. 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.

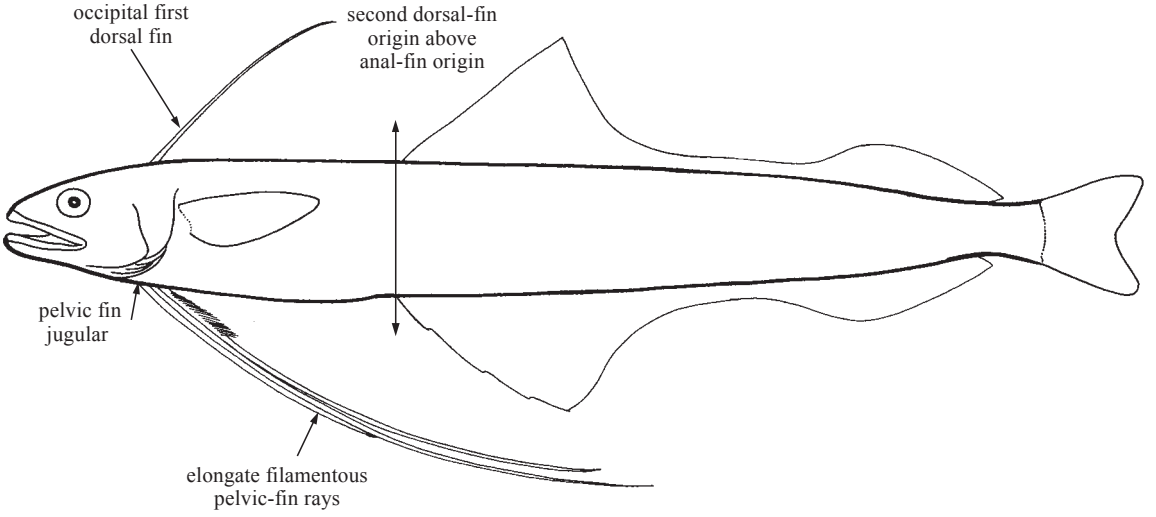
Howes, G.J. 1993. Anatomy of the Melanonidae (Teleostei: Gadiformes), with comments on its phylogenetic relationships. *Bull. Nat. Hist. Mus. (Zool.),* 59(1):11-31.

BREGMACEROTIDAE

Codlets

by A. S. Harold and R. K. Johnson (deceased), Grice Marine Laboratory, South Carolina, USA

Diagnostic characters: Small body size, reaching a little over 10 cm total length, more commonly 5 to 6 cm. **Body moderately elongate with body depth about 8 to 10 times in standard length, slightly compressed to somewhat tubular**. Head small, about 15 to 20% of standard length. Eye small, between about 1/4 and 1/3 of head length. Snout short, its length about equal to eye diameter. Mouth terminal, moderate in size, angle of jaw below posterior portion of eye. **Two dorsal fins, the first a single elongate flexible ray near the back of the head (occipital position) extending back to near leading edge of second dorsal fin and fitting into a predorsal groove when depressed; the second dorsal fin long-based, extending from anterior of midbody to near the caudal fin**; rays of middle portion of second dorsal fin short compared to rays of anterior and posterior portions of second dorsal fin, producing a marked concavity in outline of fin margin. **Anal fin of similar base length and outline to second dorsal fin, with its origin directly below that of second dorsal fin**. Second dorsal and anal fins, each with 40 to 60 soft rays; caudal fin slightly forked; pectoral fin short, with 16 to 23 rays; **pelvic fin in jugular position with 4 short branched and 3 elongate filamentous rays, the longest extending back to about middle of anal fin**. Caudal fin distinctly separate from dorsal and anal fins. Adipose fin absent. Scales small, about 60 to 80 in longitudinal series; **lateral line located dorsally, on either side of first dorsal-fin groove. Colour:** variable, ranging from pale overall with dark dorsal counter-shading to dark and minutely speckled with minute dark pigment over most of the body; silvery pigment occasionally present on side.



Habitat, biology, and fisheries: Epipelagic and mesopelagic in coastal and oceanic areas. Bregmacerotids comprise the only gadiform family limited to tropical and subtropical waters. Widely distributed in tropics and subtropics of Atlantic, Pacific, and Indian Oceans but most concentrated near land masses. Of no commercial importance in western central Atlantic, but taken as bycatch in some fisheries. Some inshore species of the family are harvested commercially in the Indo-West Pacific. Some species are locally important as forage for commercially significant fishes. Larvae are often among the 10 most abundant families represented in larval fish surveys in both coastal and offshore tropical and subtropical waters.

Remarks: Three named species and another undescribed species are reported for the area. Previous accounts of the family have reported *Bregmaceros mcclellandi* from the Atlantic but we have established that the species is restricted to the Indo-West Pacific region. The Atlantic species previously identified as *B. mcclellandi* is new and will be described elsewhere by the authors.

Similar families occurring in the area

None. The Bregmacerotidae is distinct by the elongate single dorsal-fin ray on the top of head, and the long, filamentous pelvic-fin rays inserted under the head.

List of species occurring in the area

Bregmaceros atlanticus Goode and Bean, 1886. To 5 cm. Tropical to subtropical Atlantic.
Bregmaceros cantori Millekin and Houde, 1984. To 6 cm. Tropical to subtropical W Atlantic.
Bregmaceros houdei Saksena and Richards, 1986. To 2 cm. Subtropical W Atlantic.
Bregmaceros n. sp. To 8 cm. Worldwide tropical to subtropical.

References

Milliken, D.M. and E.D. Houde. 1984. A new species of Bregmacerotidae (Pisces), *Bregmaceros cantori*, from the western Atlantic Ocean. *Bull. Mar. Sci.,* 35:11-19.

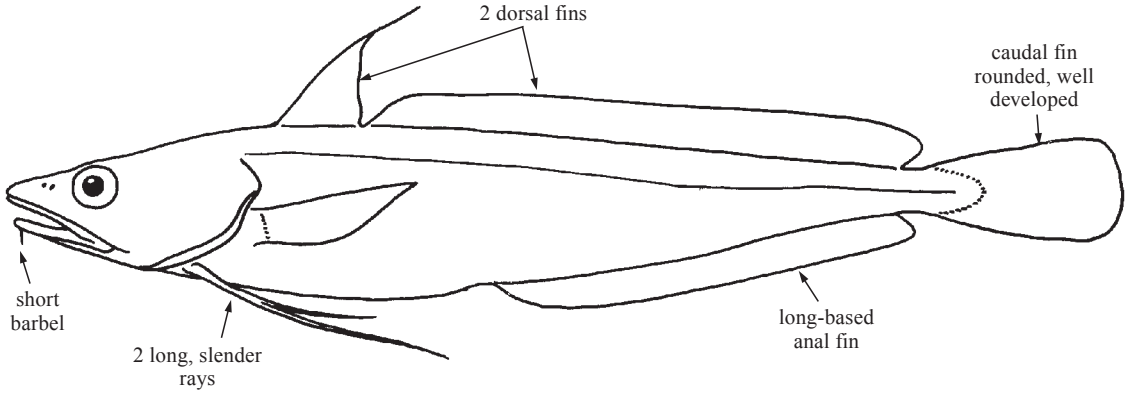
Saksena, V.P. and W.J. Richards. 1986. A new species of gadiform fish, *Bregmaceros houdei*, from the western north Atlantic. *Bull. Mar. Sci*., 38:285-292.

PHYCIDAE

Phycid hakes

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

Diagnostic characters: small to large (to about 120 cm, usually 20 to 40 cm); body moderately soft, elongated, generally rounded in front of vent, more laterally flattened behind vent; caudal peduncle narrow to moderately deep. Top of head lacking V-shaped ridge. Mouth large, lower jaw usually shorter than upper jaw; **chin barbel short**, occasionally absent in some individuals. Well-developed tooth patch on roof of mouth (vomer). **Two dorsal fins, the first short-based and long-rayed, with 8 to 13 rays, the second long-based with straight distal margin; anal fin long-based, without indentation in margin; pelvic fin with 2 rays developed into long, slender feelers**, fin base usually well forward of pectoral-fin base; **caudal fin well developed, margin rounded; not connected to dorsal and anal fins**. No light organ; swimbladder not connected to back of skull. **Colour:** olive, brown, or reddish, often becoming paler ventrally to silvery white on belly, median fins often with dark distal margins; a dusky opercular blotch in most.



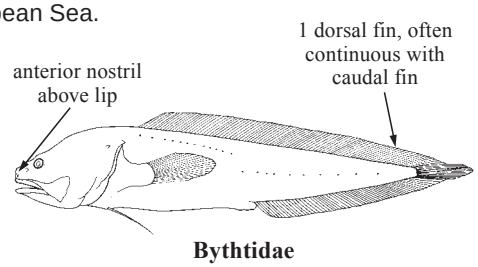
Habitat, biology, and fisheries: Demersal, mostly on soft mud or sand bottoms, from shallow coastal waters to offshore waters at upper continental slope depths. Young of most species found close inshore, often in estuaries in low salinity waters, migrating offshore as adults; adults of most species migrate inshore in summer and autumn for spawning, then offshore to deeper waters. Feeds primarily on small fish and crustaceans (especially shrimp and amphipods), but also on polychaetes and molluscs (especially squid). Of limited commercial importance in the area, although some incidentally trawled in substantial quantities and may be a potential resource. Taken primarily by bottom trawls, but also captured in gill nets and with longlines. Marketed fresh, dried, frozen, smoked, as fish cakes, or used as animal feed; livers in some yield oils, swimbladder used in gelatins.

Remarks: Phycid hakes most often treated in past as subfamily of Gadidae and members of subfamily Lotinae. Two genera and many species, some of uncertain status; at least 7 species in area, with an eighth, possibly undescribed, species from Gulf of Mexico and Caribbean Sea.

Similar families occurring in the area

Among similar families in area, only some species of Bythitidae, Ophidiidae, and Moridae have pelvic fins developed into long, slender feelers. Species in the first 2 families have a single dorsal fin, and morids have few or no teeth on the vomer and a swimbladder with anterior projections that connect to back of skull.

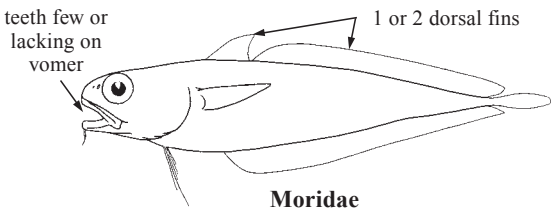
Bythitidae: 1 long-based dorsal fin; anterior nostril immediately above upper lip in most; viviparous, males with an external intromittent organ.



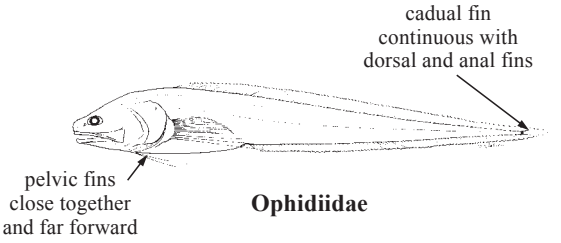
Bythtidae

Moridae: 2 dorsal fins, 1or 2 anal fins; teeth few or lacking on vomer; swimbladder with anterior projections that connect to rear of skull.

Ophidiidae: one long-based dorsal fin; caudal fin connected with dorsal and anal fins; bases of pelvic fins close together, without a broad scaled space between.



Moridae



Ophidiidae

Key to the species of Phycidae occurring in the area (adapted from Cohen, 1990)

1a. First dorsal fin with an elongated ray . . . . . → *2*

1b. First dorsal fin without an elongated ray . . . . . → *4*

2a. Longest ray in pelvic fin reaching nearly to or beyond end of anal-fin base (Fig. 1) . . . . . *Phycis chesteri*

2b. Longest ray in pelvic fin not reaching beyond midpoint of anal-fin base . . . . . → *3*

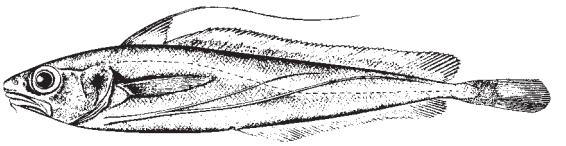


Fig. 1 ***Phycis chesteri***

3a. Upper limb of first gill arch with 2 rakers (rarely 3); scale rows between first dorsal fin and lateral line 11 or more (Fig. 2) . . . . . *Urophycis tenuis*

3b. Upper limb of first gill arch with 3 rakers (rarely 2); scale rows between first dorsal fin and lateral line about 7 (Fig. 3) . . . . . *Urophycis chuss*

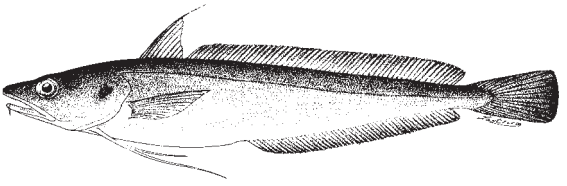


Fig. 2 ***Urophycis tenuis***

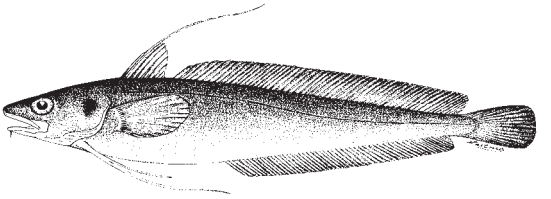


Fig. 3 ***Urophycis chuss***

4a. Scale rows between first dorsal fin and lateral line 18 to 21 (Fig. 4) . . . . . *Urophycis earllii*

4b. Scale rows between first dorsal fin and lateral line 12 or fewer . . . . . → *5*

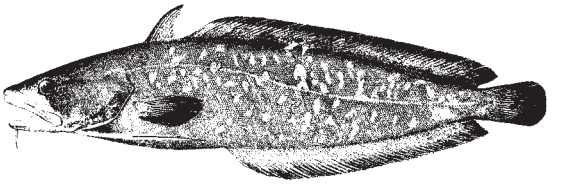


Fig. 4 ***Urophycis earllii***

5a. Upper limb of first gill arch with 2 rakers (Fig. 5) . . . . . ***Urophycis floridana***

5b. Upper limb of first gill arch with 3 (rarely 2) rakers. . . . . → ***6***

6a. A series of dark spots on head; first dorsal fin with a dark blotch and distinct white margin (Fig. 6) . . . ***Urophycis regia***

6b. No series of dark spots on head; first dorsal fin lacking dark blotch or white margin (Fig. 7). . . . . ***Urophycis cirrata***

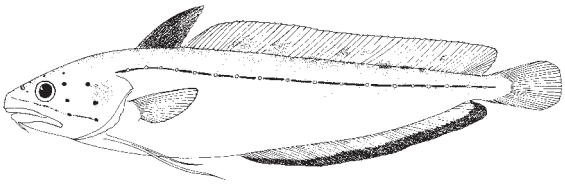


Fig. 5 ***Urophycis floridana***

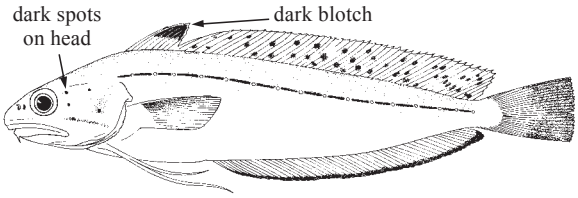


Fig. 6 ***Urophycis regia***

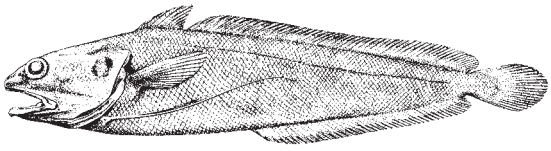


Fig. 7 ***Urophycis cirrata***

List of species occurring in the area

The symbol ◄ is given when species accounts are included.

◄ *Phycis chesteri* Goode and Bean, 1878.

◄ *Urophycis chuss* (Walbaum, 1792).
◄ *Urophycis cirrata* (Goode and Bean, 1896).
◄ *Urophycis earllii* (Bean, 1880).
◄ *Urophycis floridana* (Bean and Dresel, 1884).
◄ *Urophycis regia* (Walbaum, 1792).
◄ *Urophycis tenuis* (Mitchill, 1814).

References

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.

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

Markle, D.F. , D.A. Methven, and L.J. Coates-Markle. 1982. Aspects of spatial and temporal cooccurrence in the life history stages of the sibling hakes, *Urophycis chuss* (Walbaum 1792) and *Urophycis tenuis* (Mitchill 1815)(Pisces: Gadidae). *Can. J. Zool.*, 60(9):2057-2078.

Musick, J.A. 1972. A meristic and morphometric comparison of the hakes, *Urophycis chuss* and *U. tenuis* (Pisces, Gadidae). *Fish. Bull. (U.S.),* 71(2):479-488.

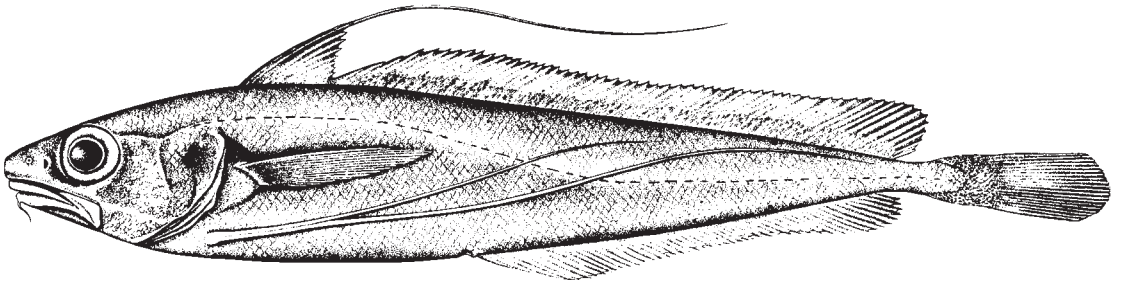
Wenner, C.A. 1983. Biology of the longfin hake, *Phycis chesteri* in the western North Atlantic. *Biol. Oceanogr.,* 3:41-75.

Phycis chesteri Goode and Bean, 1878

GPE

Frequent synonyms / misidentifications: None / None.

FAO names: En - Longfin hake; **Fr** - Merluche à longues nageois.

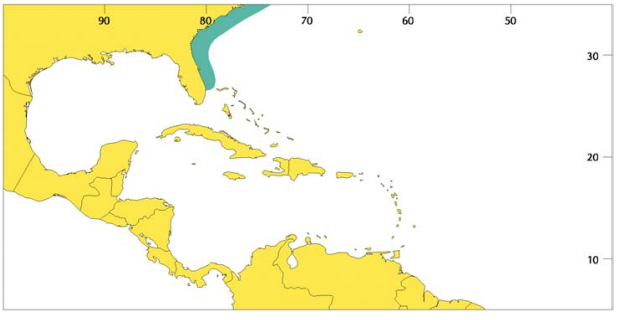


Diagnostic characters: Body elongated, greatest depth about 6 in total length; head about 5.5 in total length. Eye large, about 3.5 times in head. **First dorsal fin with 9 or 10 rays, the third prolonged** and longer than head; second dorsal fin with 55 to 57 rays; **longest pelvic fin ray reaching near or beyond posterior end of anal-fin base**. About 90 rows of scales along lateral line. **Colour:** olive above and on sides, belly silvery white; margins of dorsal, anal, and caudal fins darker.

Size: To about 40 cm, commonly to about 30 cm.

Habitat, biology, and fisheries: Benthopelagic, living on or near bottom at depths from 90 to about 1400 m; most abundant between 360 and 800 m, but depths to 1 370 m recorded. Often seen or photographed curled in depressions in the substrate. Females usually greatly outnumber males (sex ratio 1:2.85). Spawns on continental slope from autumn to early spring, with peak in December and January. Feeds primarily on crustaceans, but also on molluscs and fishes. Currently not of commercial importance, but often abundant in trawl catches to north of area. Flesh somewhat soft.

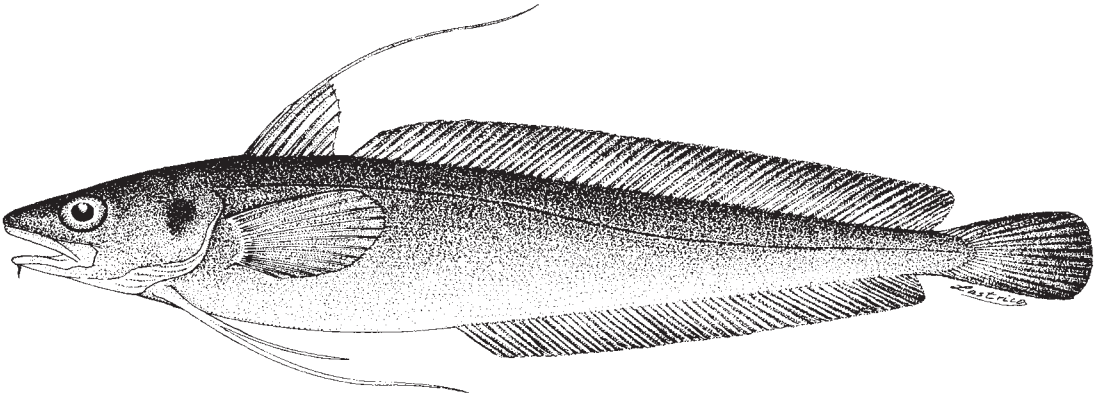
Distribution: From Labrador Sea off Newfoundland south to Florida Straits, but not abundant south of Cape Hatteras.



Urophycis chuss (Walbaum, 1792) HKR

Frequent synonyms / misidentifications: *Enchelyopus americanus* Bloch and Schneider, 1801; *Gadus longipes* Mitchill, 1814; *Phycis marginatus* Rafinesque, 1818; *Phycis filamentosus* Storer, 1858 / *Urophycis tenuis* (Mitchill, 1814).

FAO names: En - Red hake; **Fr** - Merluche écureuil; **Sp** - Locha roja.



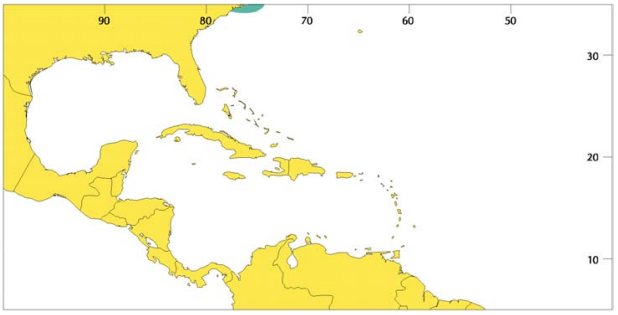
Diagnostic characters: Body elongated, greatest depth 5 to 6 in total length; head about 4.5 to 5 in total length. Eye large, about 3.5 to 4 times in head. **First dorsal fin with 9 rays, the third prolonged** and longer than head; second dorsal fin with about 57 rays; anal fin with 48 to 50 rays; **longest pelvic-fin ray reaching near anterior end of anal fin**. About 110 rows of scales along lateral line. **Colour:** variable from reddish to olive-brown above, sides paler, sometimes with dusky spots; belly and underside of head pale; a dusky blotch on opercle; fins generally darker except for pale pelvic fins.

Size: To about 50 cm, commonly 30 to 40 cm.

Habitat, biology, and fisheries: Lives on or near bottom at depths from near shore to more than 550 m depth, most abundant at 110 and 130 m; juveniles live in shallow waters along coast, migrating to deeper waters with increasing size. Juveniles live commensually in scallops (*Placopecten magellanicus*), then in the vicinity of scallop beds until their second year of life. Matures in two years at about 30 cm; moves inshore from spring to summer to spawn, and spends winter offshore in deeper waters; depth and distribution highly dependent on temperature. Feeds primarily on crustaceans, but also on squid and fishes. Of variable commercial importance, but of minor importance in Area 31. Taken in trawls; marketed fresh and frozen; smaller fish used in animal feeds.

Distribution: From southern Nova Scotia to North Carolina.

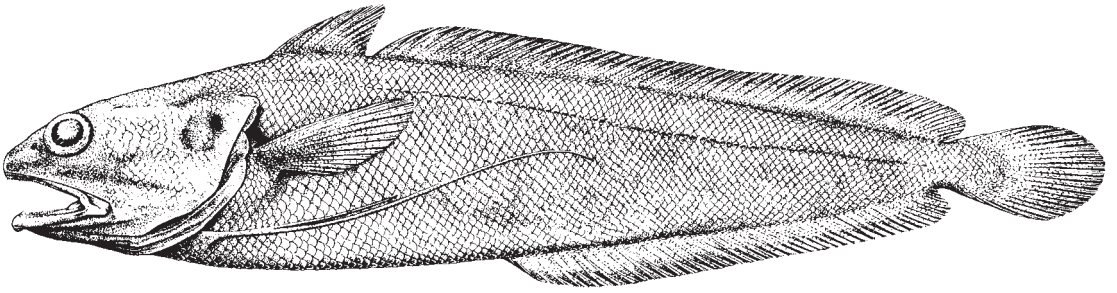
Remarks: The species was formerly confused with the white hake, *U. tenuis*, but Musick (1973, 1974) confirmed differences in morphometry, distribution, and life history of the two species. Markle et al. (1982) compared other life history traits of the 2 sibling hake species.



Urophycis cirrata (Goode and Bean, 1896) URI

Frequent synonyms / misidentifications: None / None.

FAO names: En - Gulf hake; **Fr** - Phycis du Golfe; **Sp** - Locha de fondo.

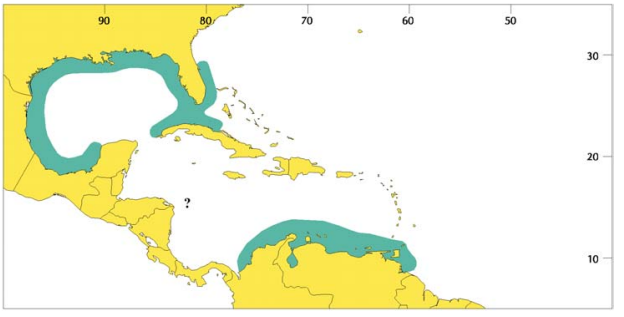


Diagnostic characters: Body elongated, greatest depth about 5 to 5.7 in total length; head 4 to 4.5 in total length. Eye small, about 5 times in head. **Three (rarely 2) gill rakers on upper limb of anterior gill arch. First dorsal fin with 9 or 10 rays, none prolonged**; second dorsal fin with about 66 rays; anal fin with about 57 rays; **longest ray of pelvic fin reaching beyond origin of anal fin**. About 93 rows of scales along lateral line. **Colour:** brownish above, belly silvery white; a diffuse dusky blotch on operculum, **no dark spots on cheek; first dorsal fin without a distinct white margin.**

Size: To at least 57 cm, commonly to about 35 cm.

Habitat, biology, and fisheries: Lives over mud bottoms from 27 to 684 m; most common in 360 to 470 m. Little known about life history. No commercial fishery so far as known.

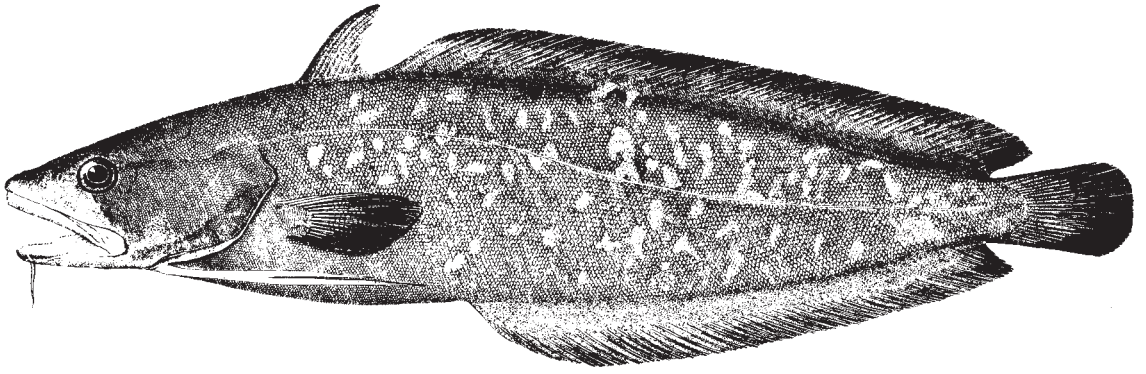
Distribution: From east coast of Florida, into Gulf of Mexico, and along Caribbean coast of South America. Some questionable records from Brazil.



Urophycis earllii (Bean, 1880) URE

Frequent synonyms / misidentifications: None / None.

FAO names: En - Carolina hake.



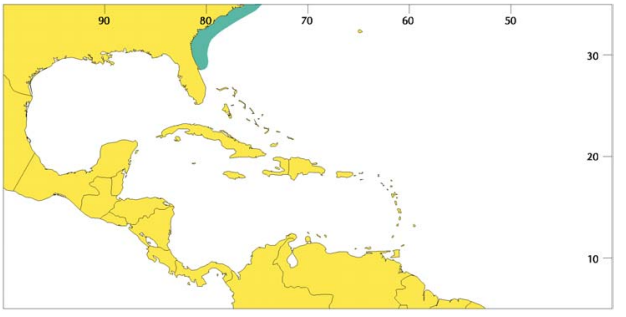
Diagnostic characters: Body moderately elongated, greatest depth about 5 in total length; head about 4.2 in total length. Eye about 6 to 6.5 times in head. **Two gill rakers on upper limb of anterior gill arch. First dorsal fin with 10 rays, none prolonged**; second dorsal fin with about 60 rays; **longest pelvic-fin ray falling short of anterior end of anal fin. Scales small, about 18 to 21 rows between lateral line and first dorsal fin**; more than 150 rows of scales along lateral line. **Colour:** dark overall with sides mottled.

Size: To about 45 cm total length.

Habitat, biology, and fisheries: Lives on or near bottom from near shore to depths of about 80 m; prefers hard bottoms. Little known of biology. Taken as bycatch in trawls, but no commercial fishery for species.

Distribution: Distribution restricted: Cape Hatteras to northeast coast of Florida.

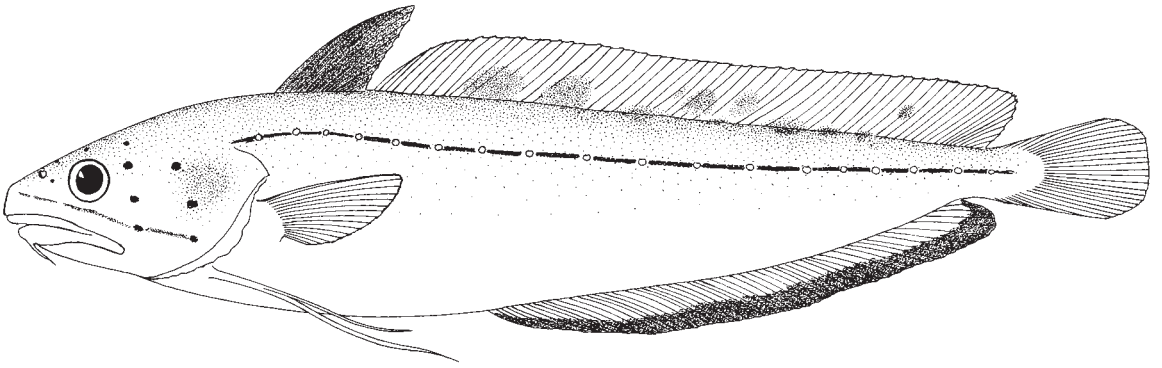
Remarks: A closely similar undescribed species apparently occurs in the Gulf of Mexico.



Urophycis floridana (Bean and Dresel, 1884) URF

Frequent synonyms / misidentifications: None / None.

FAO names: En - Southern codling (AFS: Southern hake); **Fr** - Phycis de Floride; **Sp** - Locha de Florida.

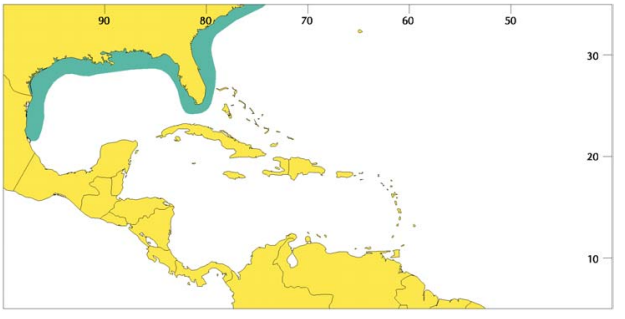


Diagnostic characters: Body elongated, greatest depth about 5.0 to 5.5 in total length; head about 4.5 in total length. Eye about 6 times in head. **Two gill rakers on upper limb of anterior gill arch. First dorsal fin with 11 to 13 rays, none prolonged**; second dorsal fin with 54 to 59 rays; anal fin with 49 to 52 rays; longest pelvic-fin ray not reaching anal fin in adults. About 110 to 120 rows of scales along lateral line. **Colour:** brownish above, belly silvery white, **lateral line dark with row of pale spots**; a diffuse dusky blotch on operculum, **a series of dark spots on cheek; dorsal fin without a distinct white margin.**

Size: To about 35 cm, commonly to about 25 cm.

Habitat, biology, and fisheries: Lives on or near bottom from near-shore to depths of about 400 m; most abundant in less than 300 m; juveniles spend part of life in estuaries. Feeds in shallow water on crustaceans, worms, and fishes. Fished in coastal waters with bottom trawls; marketed fresh.

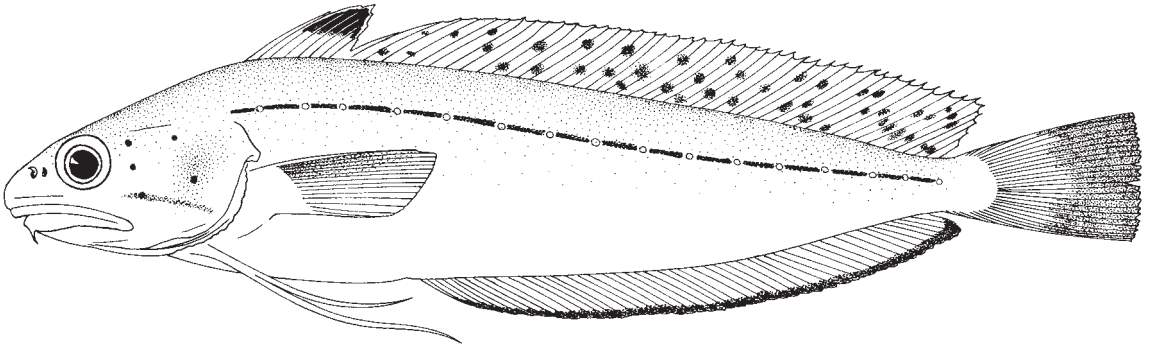
Distribution: From about Cape Hatteras south to Florida and into northern Gulf of Mexico.



Urophycis regia (Walbaum, 1792)

Frequent synonyms / misidentifications: None / None.

FAO names: En - Spotted codling (AFS: Spotted hake); **Fr** - Phycis tachetè; **Sp** - Locha regia.

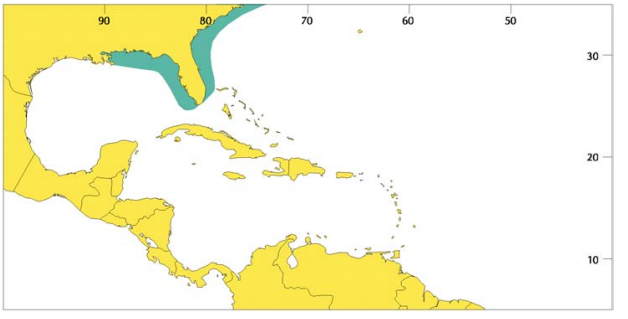


Diagnostic characters: Body moderately elongated, greatest depth about 5 in total length; head about 4.5 in total length. Eye about 6 times in head. **Three gill rakers on upper limb of anterior gill arch**. First dorsal fin with 8 or 9 rays, none prolonged; second dorsal fin with 46 to 51 rays; **longest pelvic-fin ray reaching near or slightly beyond anterior end of anal fin**. About 90 to 95 rows of scales along lateral line. **Colour:** brownish above and on sides, whitish on belly; **lateral line dark with white spots at intervals**; a large diffuse spot on operculum, **a series of small dark spots on cheek; upper half of first dorsal fin black with white edging; second dorsal fin with irregular dark spots.**

Size: To about 41 cm, commonly to about 17 cm.

Habitat, biology, and fisheries: Lives on or near bottom from near shore to depths 420 m; most abundant between 110 and 185 m; juveniles spend part of their lives in estuaries. Spawns in offshore waters from late summer to winter. Feeds primarily on crustaceans, but also fish and squid. Of limited commercial importance, taken in bottom trawls and with hook-and-line. Marketed fresh or used for fish meal.

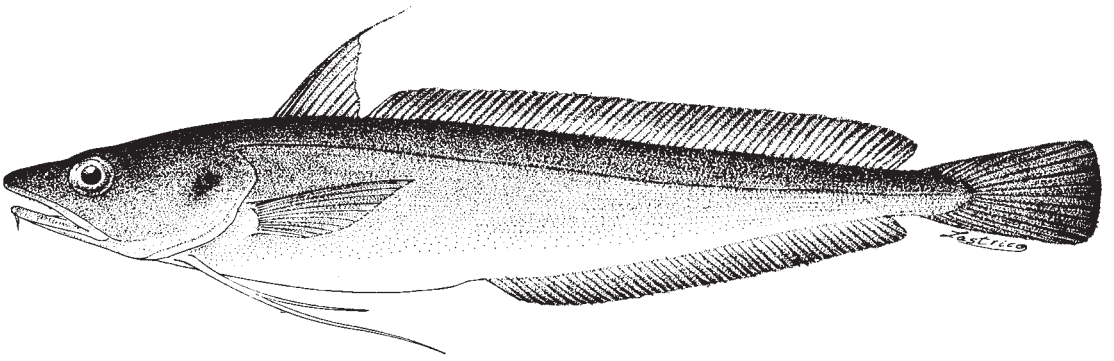
Distribution: From somewhat north of Cape Cod south to Florida, and into the northeastern Gulf of Mexico.



Urophycis tenuis (Mitchill, 1814)

Frequent synonyms / misidentifications: None / *Urophycis chuss* (Walbaum, 1792); *Phycis americanus* Storer, 1858.

FAO names: En - White hake; **Fr** - Merluche blanche; **Sp** - Locha blanca.



Diagnostic characters: Body elongated, greatest depth 5 to 6 in total length; head about 4.5 to 5 in total length. Eye large, about 3.5 to 4 times in head. **Two gill rakers on upper limb of anterior gill arch. First dorsal fin with 9 or 10 rays, the third prolonged** but less than head length; second dorsal fin with 54 to 57 rays; anal fin with 48 to 50 rays; **longest pelvic-fin ray falling short of anal fin**. About 140 rows of scales longitudinally along body. **Colour:** variable from purplish brown to slate above, dirty white to yellowish on belly; fins generally match adjacent body colour.

Size: To about 135 cm, commonly to 70 cm.

Habitat, biology, and fisheries: Lives over soft mud or sand bottoms of continental shelf and upper slope at depths of more than 980 m, most abundant at about 180 m. Matures in 3 to 5 years at 40 to 50 cm; moves inshore in summer to spawn, and spends winter offshore in deeper waters. Feeds on crustaceans, squid, and fishes. Of variable commercial importance in primary distribution areas, but of little importance in Area 31. Taken in trawls; marketed fresh, salted and dried, and canned.

Distribution: From Iceland, Labrador, and Newfoundland to North Carolina, straying to east coast of Florida in deep water.

Remarks: Musick (1974) clarified differences in the life history and distribution of the white hake and the red hake, *U. chuss*. Previous confusion between the two species had resulted in unreliable records of distribution and fishery for them.