

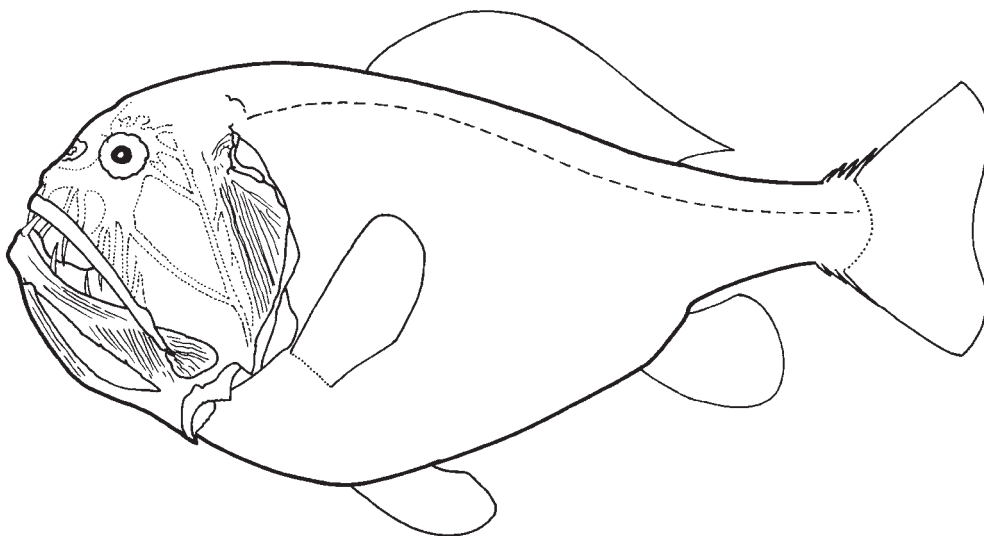
Order BERYCIFORMES

ANOPLOGASTRIDAE

Fangtooths (ogrefish)

by J.A. Moore, Florida Atlantic University, USA

Diagnostic characters: Small (to about 160 mm standard length) beryciform fishes. Body short, deep, and compressed, tapering to narrow peduncle. Head large (1/3 standard length). **Eye smaller than snout length in adults**, but larger than snout length in juveniles. **Mouth very large and oblique, jaws extend behind eye in adults; 1 supramaxilla.** Bands of villiform teeth in juveniles are replaced with **large fangs on dentary and premaxilla in adults**; vomer and palatines toothless. Deep sensory canals separated by serrated ridges; very large parietal and preopercular spines in juveniles of one species, all disappearing with age. **Gill rakers as clusters of teeth on gill arch in adults** (lath-like in juveniles). **No true fin spines; single, long-based dorsal fin with 16 to 20 rays; anal fin very short-based with 7 to 9 soft rays;** caudal fin emarginate; pectoral fins with 13 to 16 soft rays; pelvic fins with 7 soft rays. **Scales small, non-overlapping, spinose, goblet-shaped in adults; lateral line an open groove partially bridged by scales;** no enlarged ventral keel scutes. **Colour:** entirely dark brown or black in adults.



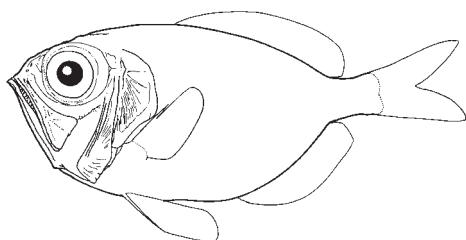
Habitat, biology, and fisheries: Meso- to bathypelagic, at depths of 75 to 5 000 m. Carnivores, with juveniles feeding on mainly crustaceans and adults mainly on fishes. May sometimes swim in small groups. Uncommon deep-sea fishes of no commercial importance.

Remarks: The family was revised recently by Kotlyar (1986) and contains 1 genus with 2 species throughout the tropical and temperate latitudes.

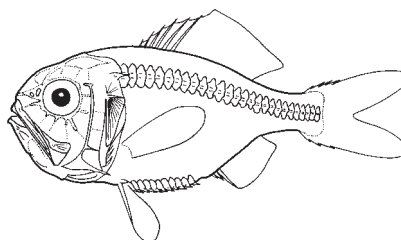
Similar families occurring in the area

Diretmidae: no fangs; anal fin long-based, with 18 to 24 rays; ventral keel scutes.

Trachichthyidae: no fangs; spines in dorsal and anal fins; ventral keel scutes.



Diretmidae



Trachichthyidae

Key to the species of Anoplogastridae occurring in the area

The species *Anoplogaster brachycera* has so far only been identified from juveniles, no specimens larger than 60 mm standard length have been recognized. Some adults currently identified as *A. cornuta* may eventually be reidentified as *A. brachycera* once a method for distinguishing adults has been determined.

- 1a. Parietal and preopercular spines very long in young juveniles (e.g. parietal 26 to 31% standard length and preopercular 31% standard length in a 19 mm standard length specimen, Fig. 1), but becoming relatively shorter with age (parietal 8 to 9% standard length and preopercular 7 to 8% standard length in 57 mm standard length specimen) . . . *Anoplogaster cornuta*
- 1b. Parietal and preopercular spines very short in young juveniles (e.g. parietal 5% standard length and preopercular 3.4% standard length in a 20 mm standard length specimen, (Fig. 2), and becoming even shorter with age (parietal and preopercular both 1.7% standard length in 60 mm standard length specimen) *Anoplogaster brachycera*

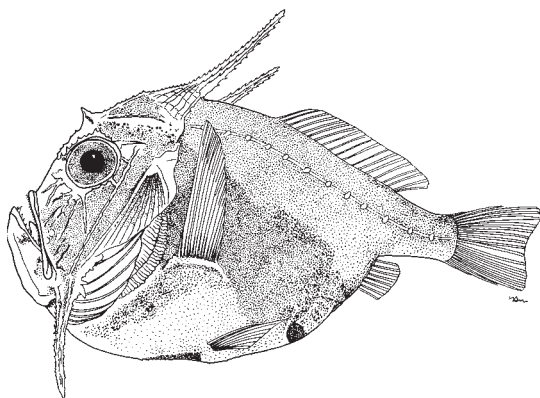


Fig. 1 *Anoplogaster cornuta*

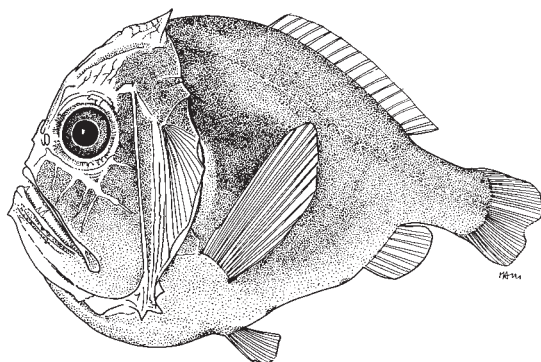


Fig. 2 *Anoplogaster brachycera*

List of species occurring in the area

- Anoplogaster brachycera* Kotlyar, 1986. 60 mm SL. Areas 31, SW21, W71.
- Anoplogaster cornuta* (Valenciennes, 1833). 160 mm SL. Tropical and temperate worldwide.

Reference

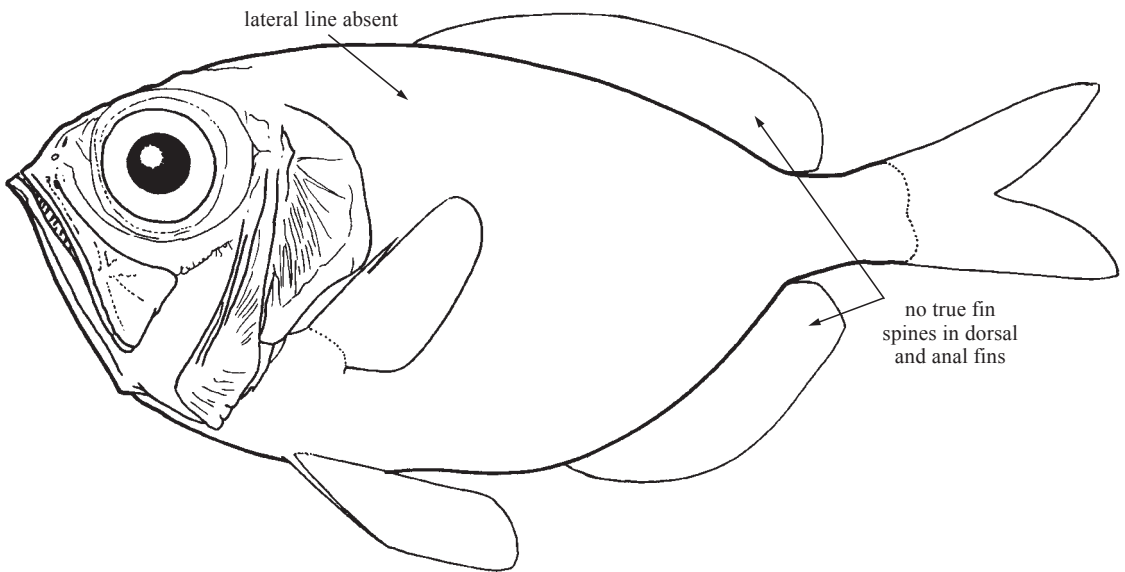
Kotlyar, A. N. 1986. Classification and distribution of fishes of the family Anoplogastridae. *Vopr. Ikhtiol.*, 26(4):531-551. [in Russian, English translation *J. Ichthyol.*, 26(4):133-152].

DIRETMIDAE

Spinyfins (discfishes)

by J.A. Moore, Florida Atlantic University, USA

Diagnostic characters: Moderate-sized (to about 370 mm standard length) beryciform fishes. Body round to oval, strongly laterally compressed. Head moderate to large; deep sensory canals separated by thin serrated ridges and covered with membranous skin; no spine on preopercle in adults. **Eye very large, much longer than snout length.** Mouth large and oblique, jaws not extending behind eye; 1 supramaxilla. Teeth small, in villiform bands, on premaxilla and dentary, vomer and palatine toothless. **No true fin spines in dorsal or anal fins, soft rays with rows of very small spinules (hence spinyfins); dorsal- and anal-fin membranes have small roundish “windows” between bases of more posterior rays;** single dorsal fin very long based, with 23 to 30 soft rays; anal fin with 18 to 24 soft rays; caudal fin forked; pectoral fins with 16 to 20 soft rays; pelvic fins with 1 flattened serrate spine and 6 soft rays. Scales small and spinose; **enlarged scales along midventral line, forming an abdominal keel of spiny scutes. Lateral line absent.** Total number of vertebrae 26 to 32. **Glandular tissue found beneath gill cover, posteroventral to last gill arch.** Juveniles up to 1.5 cm have prominent spines on preopercle and parietals. **Colour:** silvery or greyish black.

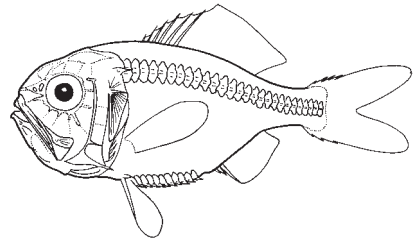


Habitat, biology, and fisheries: Meso- and bathypelagic, adults found from 200 to 2 100 m; larger adults of some species benthopelagic. Reportedly feed on small planktonic crustaceans. Uncommon deep sea fishes occasionally taken in trawls, sometimes locally abundant. No present commercial importance.

Remarks: Small family of 3 genera with 4 species, found in tropical to temperate waters worldwide. The most recent reviews are by Post and Quero (1981) and Kotlyar (1988, 1996).

Similar families occurring in the area

Trachichthyidae: dorsal and anal fins with spines; lateral line present.



Trachichthyidae

Key to the species of Diretmidae occurring in the area

- 1a. Anus immediately anterior to anal fin; series of keeled scutes along ventral midline anterior to pelvic fins; 7 to 20 bony ridges on upper half of operculum; body profile round . *Diretmus argenteus*
- 1b. Anus midway between pelvic and anal fins (separated from anal fin by at least 5 scutes); no series of keeled scutes along ventral midline anterior to pelvic fins; 3 to 6 bony ridges on upper half of operculum; body profile elliptical in adults → 2

- 2a. Tips of pelvic fins extend to or beyond anal-fin origin; 26 to 30 (usually 27 or 28) soft dorsal-fin rays; 18 to 20 rakers on first gill arch. *Diretmichthys parini*
- 2b. Tips of pelvic fins do not extend to anal-fin origin; 24 to 26 (usually 25) soft dorsal-fin rays; 12 to 16 rakers on first gill arch *Diretmoides pauciradiatus*

List of species occurring in the area

Diretmichthys parini (Post and Quéro, 1981). 370 mm SL. Tropical and temperate worldwide.

Diretmoides pauciradiatus (Woods, in Woods and Sonoda 1973). 140 mm SL. Tropical and temperate worldwide.

Diretmus argenteus Johnson, 1864. 110.5 mm SL. Tropical and temperate worldwide.

References

Kotlyar, A. N. 1988. Classification and distribution of fishes of the family Diretmidae (Beryciformes). *J. Ichthyol.*, 28(2): 1-15.

Kotlyar, A. N. 1996. *Beryciform fishes of the world*. Moscow, VNIRO Publishing, 368 p. [in Russian]

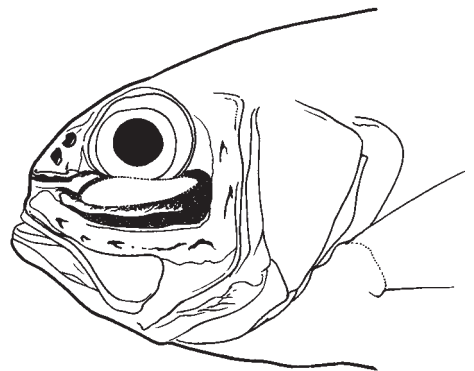
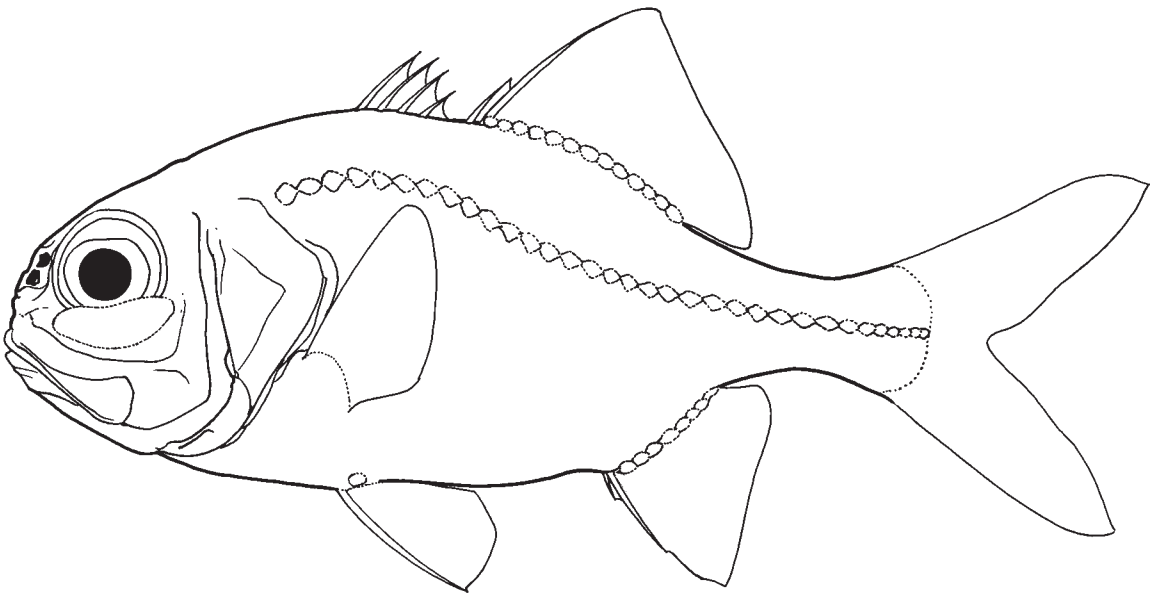
Post, A. and J. C. Quero. 1981. Revision des Diretmidae (Pisces, Trachichthyoidei) de L'Atlantique avec description d'un nouveau genre et d'un nouvelle espece. *Cybium*, 5(1):33-60.

ANOMALOPIDAE

Flashlight fishes

by J.A. Moore, Florida Atlantic University, USA

Diagnostic characters: Small beryciform fishes (to 110 mm standard length); moderately deep-bodied, 34 to 40% standard length. Head moderate-sized; sensory canals on top of head separated by broad ridges and covered by skin; no preopercular spine. **Eye large, its diameter longer than snout length; large bacterial light organ below eye, black membranous shutter can be raised to cover light organ.** Snout short and somewhat blunt. Mouth oblique and moderate-sized, posterior end of maxilla reaching to midline of eye; 2 supramaxillae. Teeth small and conical on jaws and palatines, vomer toothless. Branchiostegal rays 8. Gill rakers 6 or 7 on upper limb and 18 to 20 on lower limb of first gill arch. **Two dorsal fins, first dorsal fin with 4 spines, second dorsal fin with 2 spines and 14 soft rays, second dorsal fin twice as high as first dorsal fin;** anal fin with 2 spines and 10 soft rays; caudal fin deeply forked with 9 principal rays in upper lobe and 10 principal rays in lower lobe; pectoral fins with 16 or 17 soft rays; pelvic fins with 1 spine and 6 soft rays. Scales small, strongly spinoid; enlarged, pored lateral-line scales 32 to 34, lateral body scale rows about 140, midventral scutes 7 to 9. Vertebral column with 15 precaudal and 14 caudal (total 29) vertebrae. **Colour: body, head, and pectoral fins black; lateral-line scales, ventral scutes, and enlarged scales at bases of second dorsal and anal fins white.** In life, the white scales and distal margins of dorsal, anal, caudal, and pelvic fins are light reflective. The light organ emits blue-green light in life and is pale in preserved specimens.



Habitat, biology, and fisheries: Nocturnal reef fish, day spent in caverns in the deep reef (>100 m), at night ascending to shallower waters (27 to 76 m). Swims close to substrate, momentarily covering light organ when changing direction. Feeds on small shrimps and copepods. Apparently uses light organ to search for prey. Ripe females found January to April. Of no importance to fisheries.

lateral view of head with shutter partially covering light organ

Remarks: Seven species in 6 genera, distributed in the Caribbean, eastern Pacific, South Pacific islands, western Pacific, Red Sea, and western Indian Ocean. Most recent review of the family is in Baldwin et al. (1997) and redescription of the sole Atlantic species is by Colin et al. (1979). Fin ray, gill raker, and scale counts given above are for the Atlantic species only.

Similar families occurring in the area

The conspicuous light organ below the eye is unique to this family and distinguishes this fish from all other families in the area.

List of species occurring in the area

Kryptophanaron alfredi Silvester and Fowler, 1926. To 110 mm SL. Likely widespread in the Carib., currently known off the Cayman Is., Puerto Rico, Curaçao, Virgin Is., and S of Kingston, Jamaica.

References

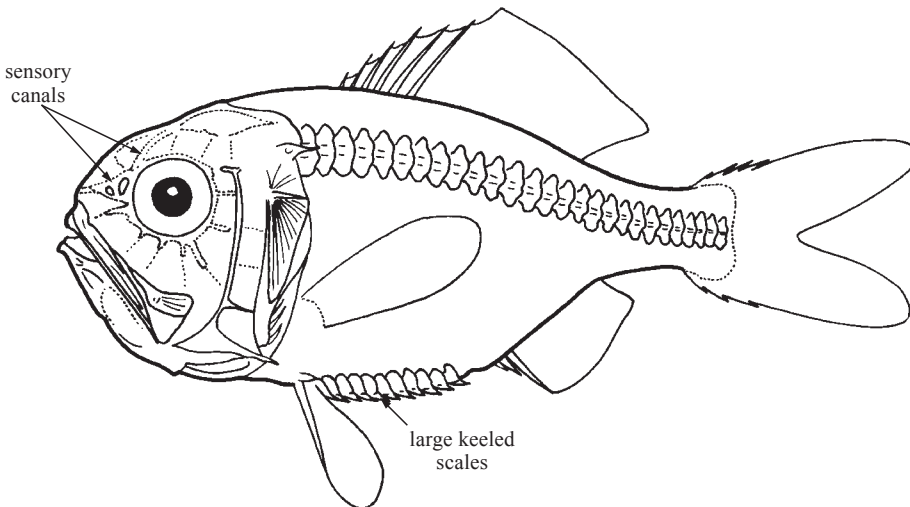
- Baldwin, C. C., G. D. Johnson, and J. R. Paxton. 1997. *Protoblepharon rosenblatti*, a new genus and species of flashlight fish (Beryciformes: Anomalopidae) from the tropical South Pacific, with comments on anomalopid phylogeny. *Proc. Biol. Soc. Wash.* 110(3):373-383.
- Colin, P. L., D. W. Arneson, and W. F. Smith-Vaniz. 1979. Rediscovery and redescription of the Caribbean anomalopid fish *Kryptophanaron alfredi* Silvester and Fowler (Pisces: Anomalopidae). *Bull. Mar. Sci.* 29(3):312-319.
- McCosker, J. E. and R. H. Rosenblatt. 1987. Notes on the biology, taxonomy, and distribution of flashlight fishes (Beryciformes: Anomalopidae). *Japan. J. Ichthyol.* 34(2):157-164.

TRACHICHTHYIDAE

Slimeheads (roughies)

by J.A. Moore, Florida Atlantic University, USA

Diagnostic characters: Medium-sized (to about 600 mm standard length, commonly to 200 mm) beryciform fishes; body oval, laterally compressed. Head large. Eyes moderate to large in diameter. Snout rounded, pair of anteriorly pointing rostral spines in *Gephyroberyx* and some *Hoplostethus*. Mouth large and obliquely angled when closed; **1 supramaxilla**. Teeth small, in villiform bands on jaws, present or absent on vomer, present on palatines. **Extensive sensory canals separated by spinous ridges and covered with membranous skin; flat, triangular spine on preopercle. One dorsal fin with 3 to 8 striated spines and 12 to 18 soft rays; anal fin with 2 to 3 spines and 8 to 12 soft rays; caudal fin forked with 4 to 8 procurrent spines in upper and lower lobes; pectoral fins with 11 to 20 rays; pelvic fins with 1 spine and 6 rays. Scales thick and spinoid or thin and cycloid, adherent to deciduous. Large keeled scales along midventral belly between pelvic and anal fins, forming row of well-developed scutes in most species. Colour:** generally reddish-orange, pinkish, or dusky silver.

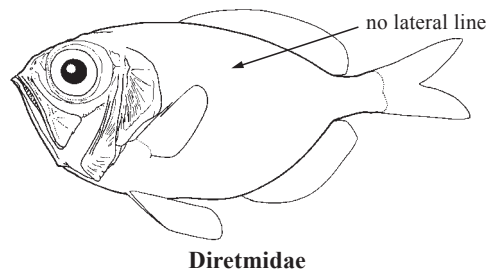
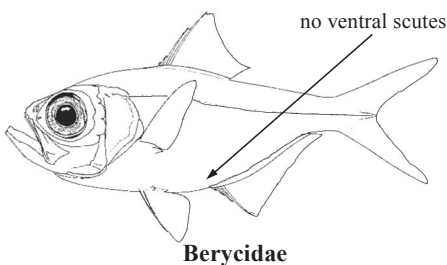


Habitat, biology, and fisheries: Occurring near the bottom over deeper parts of continental shelf, upper slope, and around seamounts at depths of 75 to more than 1 500 m, although most species are found in less than 750 m. Diets consist of mostly mesopelagic shrimp, small fishes, and squid. Some species are known to be locally abundant in feeding or spawning aggregations. Little known about reproduction or age and growth. Usually caught in bottom or pelagic trawls. Fisheries exist for orange roughy (*Hoplostethus atlanticus*) in the Atlantic off Namibia, west of Britain, and along the northern Mid Atlantic Ridge; fisheries also exist off New Zealand and Australia in the Pacific. However, recruitment in that species appears to be low and aggregations can be quickly depleted. Maximum age for orange roughy is reported at over 125 years.

Similar families occurring in the area

Berycidae: 2 supramaxillae; base of dorsal fin shorter than that of anal fin; pelvic fins with 9 to 13 soft rays; ventral scutes absent.

Dirtemidae: no spine on preopercle; no lateral line; no true spines in dorsal or anal fins.



Key to the species of Trachichthyidae occurring in the area

- 1a. Striated areas along isthmus, before pectoral-fin base and over abdominal scutes and anal fin (Fig. 1); anus between pelvic fins, dark ring-like structure surrounds anus; abdominal scutes between anus and anal fin (Fig. 2); no enlarged predorsal scales *Aulotrachichthys argyrophanus*
- 1b. No striated areas on body; anus just anterior to anal fin; abdominal scutes between pelvic fins and anus (Fig. 3); scales in midline between skull and dorsal-fin origin slightly enlarged to form predorsal keel → 2

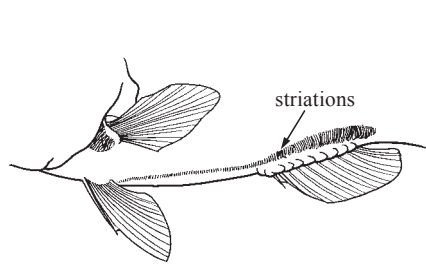


Fig. 1 lateral view
Aulotrachichthys argyrophanus

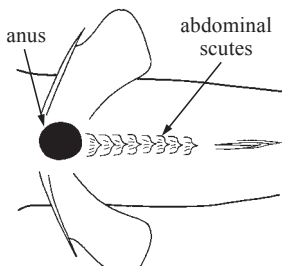


Fig. 2 ventral view
Aulotrachichthys argyrophanus

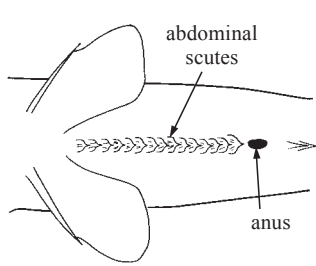


Fig. 3 ventral view

- 2a. Dorsal fin with 8 (very rarely 7) spines; lateral-line scales only slightly larger than surrounding body scales with a small flat triangular spine on each lateral-line scale (Fig. 4); prominent spine on opercle extending beyond posterior edge of opercle *Gephyroberyx darwini*
- 2b. Dorsal fin with 4 to 7 spines; lateral-line scales much larger than surrounding body scales and diamond-shaped (Fig. 5), no spine on each lateral-line scale; no prominent spine extending beyond posterior edge of opercle → 3

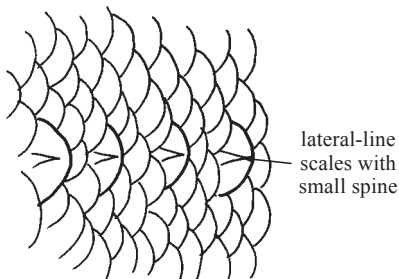


Fig. 4 lateral-line scales

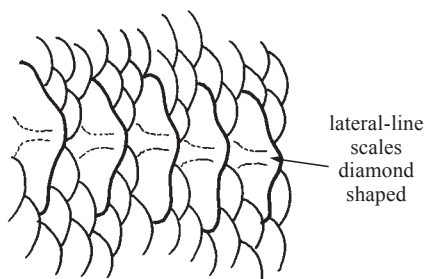




Fig. 5 lateral-line scales

- 3a. Dorsal-fin soft rays 15 to 18; anal-fin soft rays 10 to 12 (usually 11); pectoral-fin rays 17 to 20 (usually 19); ventral keel scutes smaller, 13 to 20 or even indistinct in some specimens *Hoplostethus atlanticus*
- 3b. Dorsal-fin soft rays 12 to 14; anal-fin soft rays 8 to 10; pectoral-fin rays 14 to 16; ventral keel scutes 8 to 17 and always distinctly enlarged → 4
- 4a. Anal-fin soft rays 9 or 10 (usually 10); abdominal scutes 8 to 12 (usually 9 to 11); upper gill rakers 7 or 8, total number of gill rakers 23 to 26; widespread silvery areas on lower jaw, cheek, gill cover, abdomen, and flank below lateral line *Hoplostethus mediterraneus*
- 4b. Anal-fin soft rays 8 to 10 (usually 9); abdominal scutes 10 to 17 (usually 11 to 16); upper gill rakers 5 or 6, total number of gill rakers 18 to 22; no widespread silvery areas on jaw, cheek, gill cover, abdomen, or lower sides *Hoplostethus occidentalis*

List of species occurring in the area

The symbol  is given when species accounts are included.

 *Aulotrachichthys argyrophanus* (Woods, 1961).

 *Gephyroberyx darwinii* (Johnson, 1866).

 *Hoplostethus atlanticus* Collett 1889.

 *Hoplostethus mediterraneus* Cuvier, 1829.

 *Hoplostethus occidentalis* Woods, in Woods and Sonoda 1973.

References

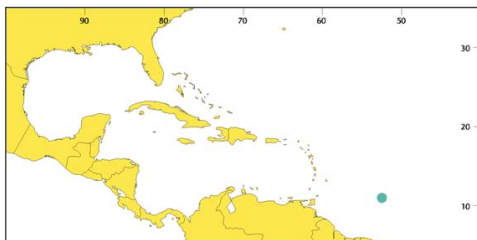
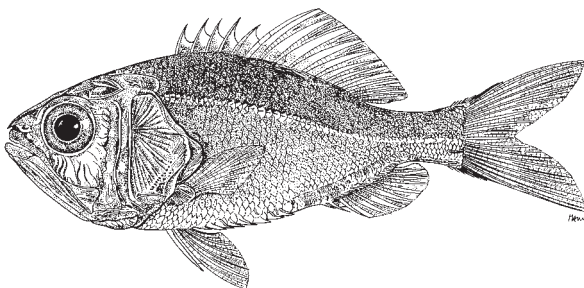
Kotlyar, A.N. 1996. *Beryciform fishes of the world oceans*. Moscow, VNIRO Publishing, 368 p. [in Russian].

Woods, L.P. and P. Sonoda. 1973. Order Berycomorphi (Beryciformes). In: Fishes of the Western North Atlantic. *Mem. Sears Found. Mar. Res.*, 1(6):263-396.

***Aulotrachichthys argyrophanus* (Woods, 1961)**

En - Western luminous roughy.

Maximum size to 75 mm standard length; common to 45 mm. Originally described from edge of the shelf near the mouth of Amazon River. Larvae are found in our area over 1 seamount and adult populations may possibly occur there and along the continental slope of South America or the Lesser Antilles. Of no commercial importance.

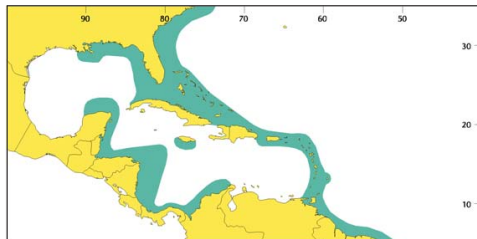
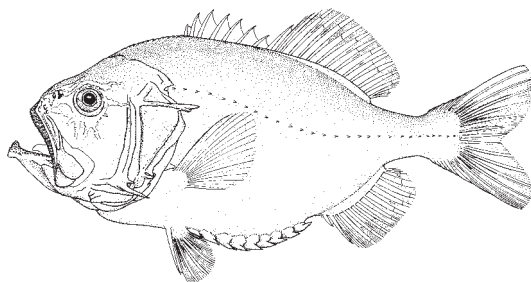


***Gephyroberyx darwinii* (Johnson, 1866)**

GXW

En - Darwin's slimehead, (AFS: Big roughy); **Fr** - Hoplostète de Darwin; **Sp** - Reloj de Darwin.

Maximum size to 480 mm standard length; common to 250 mm. Known throughout the area from slopes of continents and islands in Caribbean, Gulf of Mexico, and southeastern USA between depths of 73 and 640 m. Reportedly found over hard bottoms. Taken occasionally in trawls. Similarity in size to orange roughy and potential for aggregations could make this a target for deep-water fisheries.

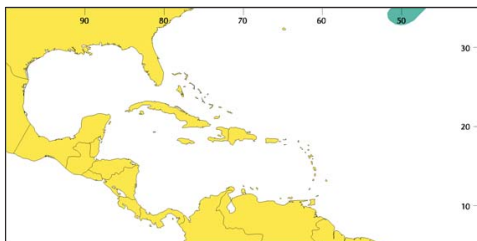
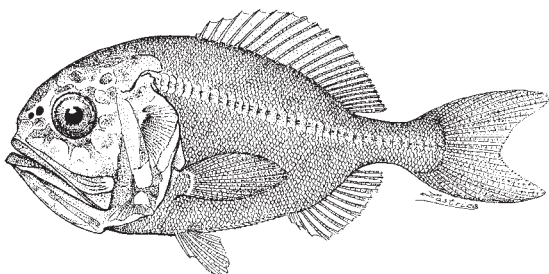


***Hoplostethus atlanticus* Collett 1889**

ORY

En - Orange roughy; **Fr** - Hoplostète orange; **Sp** - Reloj anaranjado.

Maximum size to 600 mm standard length; commonly to 450 mm. Only known in our area from Corner Rise Seamounts, but could potentially be found around higher elevations along Mid-Atlantic Ridge. Benthopelagic, aggregating near high-relief topographic features at depths of 500 to 1 500 m or more. Caught in trawls. Commercial catches to the west of Britain by French vessels peaked in 1992 at 4 462 t, but have since declined to 1 300 t in 1997. Iceland landed 800 t in 1997 from the Mid-Atlantic Ridge south of that island.

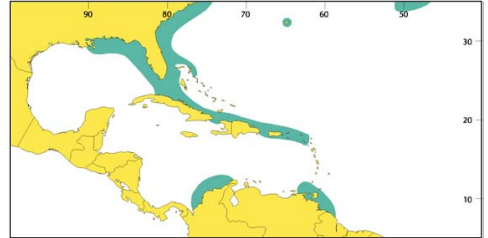
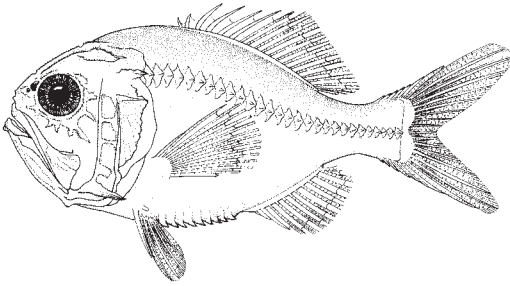


***Hoplostethus mediterraneus* Cuvier, 1829**

HPR

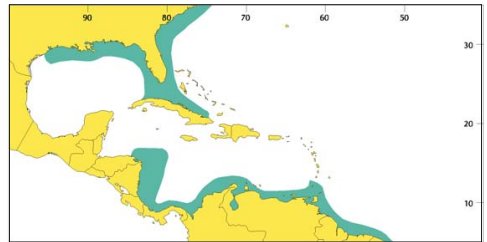
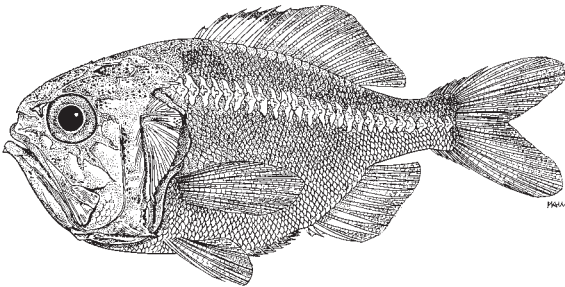
En - Mediterranean slimehead (AFS: Silver roughy); **Fr** - Hoplostète argenté; **Sp** - Reloj mediterráneo.

Maximum size reportedly 420 mm standard length; common 100 to 200 mm. Uncommon in northern Gulf of Mexico and Caribbean, more common along southeast coast of USA. Also known from Bermuda and Corner Rise Seamounts. Living near bottom in deep water, from 100 to 950 m depth. Taken as bycatch in Russian trawl fishery for slender alfonsino in vicinity of Corner Rise Seamounts.

***Hoplostethus occidentalis* Woods, in Woods and Sonoda 1973**

En - Western roughy; **Sp** - Reloj occidental.

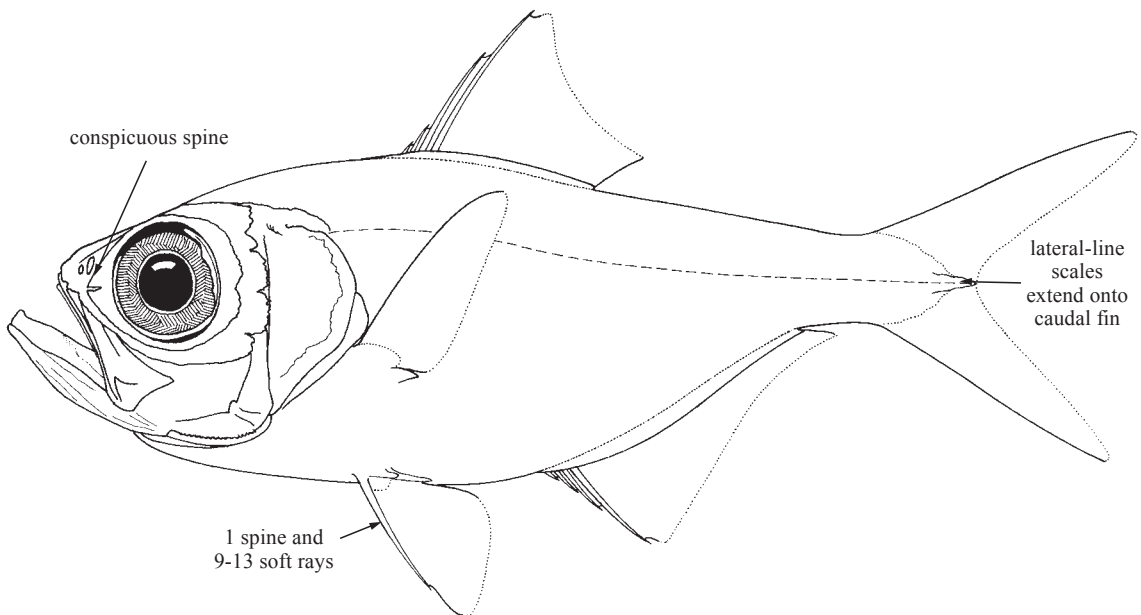
Maximum size to 173 mm standard length; common to 120 mm. More common around northern South America, in Caribbean, and in Gulf of Mexico, rarer along southeastern USA. Living near bottom along slopes at depths of 150 to 550 m. Of no commercial importance.



BERYCIDAE**Alfonsinos**

by J.A. Moore, Florida Atlantic University, USA

Diagnostic characters: Moderate-sized (to about 550 mm standard length) beryciform fishes. Body oval, moderately deep to very deep, compressed. Head moderately large. Eyes very large, its diameter greater than snout length. Mouth large, oblique, jaws not reaching posterior margin of eye; maxilla expanded posteriorly; **2 supramaxillae**. Teeth small, in villiform bands on jaws, vomer, and palatines. **Large sensory canals on top of head separated by thin ridges and covered with membranous skin; conspicuous laterally-projecting spine on lachrymal, anterior to eye and ventral to nostrils;** cheeks and opercle largely covered by scales; **no spines on preopercle**. In young individuals (less than 75 mm standard length), anterior dorsal-fin soft rays and pelvic-fin rays can be elongate; 1 dorsal fin with 3 to 5 spines and 12 to 20 soft rays; anal fin with 3 or 4 spines and 25 to 30 soft rays; caudal fin deeply forked; pectoral fins with 15 to 18 soft rays; **pelvic fins with 1 spine and 9 to 13 soft rays**. Scales spinose; **lateral line with 61 to 82 pored scales, the last few extending onto caudal fin;** no enlarged scales along ventral midline. Pyloric caeca 23 to 100. **Colour:** generally bright red on head, back, and fins, silvery pink or yellowish pink on lower sides and belly.



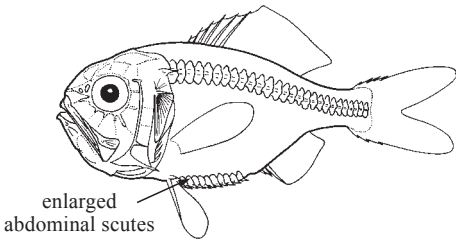
Habitat, biology, and fisheries: Benthic or benthopelagic fishes on shelf and slope, also associated with seamounts; found down to 1 300 m; sometimes known to vertically migrate into shallower waters at night. They are carnivores feeding mostly on mesopelagic crustaceans, fishes, and squids. Species in the genus *Beryx* are commercially important in many parts of the world. FAO statistics report landings ranging from 15 to 278 t from 1995 to 1999. Usually caught in trawls or on longlines.

Remarks: Two genera with 9 or 10 species found throughout the tropical and temperate oceans, except the northeast Pacific.

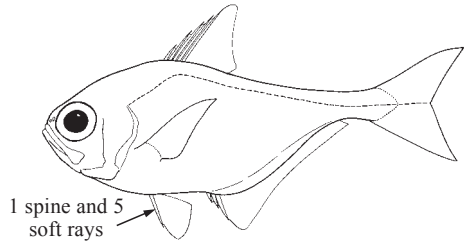
Similar families occurring in the area

Trachichthyidae: pelvic fin with 1 spine and 6 soft rays; enlarged abdominal scutes present; 1 supramaxilla.

Pempheridae: pelvic fin with 1 spine and 5 soft rays; no supramaxillae.



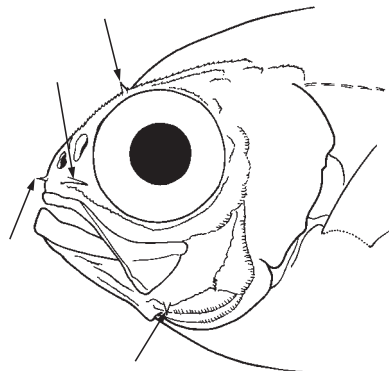
Trachichthyidae



Pempheridae


Key to the species of Berycidae occurring in the area


- 1a. Greatest body depth 44 to 50% of standard length; 4 pairs of spines on head: on nasal, lachrymal, frontal, and lower cheek (Fig. 1); dorsal fin with 16 to 20 soft rays; anal-fin origin below middle of dorsal fin; pelvic fins with 9 or 10 soft rays; lateral-line scales 61 to 73; pyloric caecae 74 to 100 . . . *Beryx decadactylus*
- 1b. Greatest body depth 33 to 40% of standard length; only 1 pair of spines on head (lachrymal); dorsal fin with 13 to 15 soft rays; anal-fin origin behind or just below posterior end of dorsal fin; pelvic fins with 11 to 13 soft rays; lateral-line scales 69 to 82; pyloric caecae 23 to 30. *Beryx splendens*



**Fig. 1 pairs of spines on head
*Beryx decadactylus***

List of species occurring in the area

The symbol  is given when species accounts are included.

 *Beryx decadactylus* Cuvier, 1829.

 *Beryx splendens* Lowe, 1834.

References

Busakhin, S.V. 1982. Systematics and distribution of the family Berycidae (Osteichthyes) in the world ocean. *J. Ichthyol.*, 22(2):1-21.

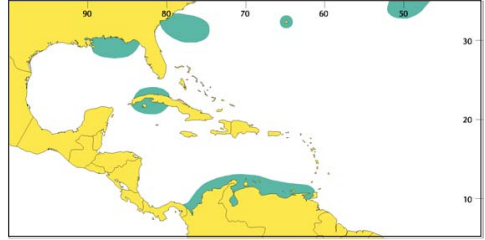
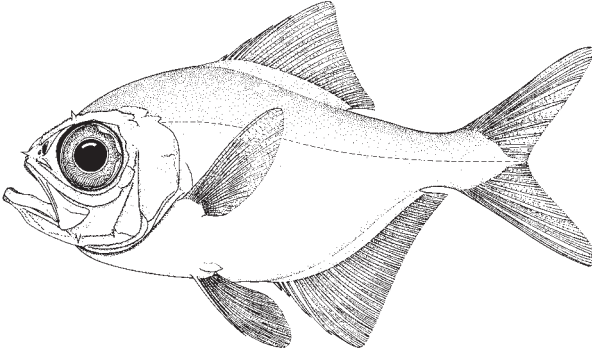
Kotlyar, A.N. 1996. *Beryciform fishes of the world ocean*. Moscow, VNIRO Publishing, 368 p. [in Russian].

Beryx decadactylus Cuvier, 1829

BXD

En - Alfonsino (AFS: Red bream); **Fr** - Béryx commun; **Sp** - Alfonsino palometón.

Maximum size to 430 mm standard length; common to 350 mm. Known from isolated records off northern coast of South America, Greater Antilles, northern Gulf of Mexico, southeastern US, Bermuda, and Corner Rise Seamounts. Probably widespread throughout the area, but uncommon. Benthopelagic from 150 to 1 000 m. Widespread fisheries in eastern Atlantic and elsewhere. Caught using longlines or trawls. Highly regarded food fish.

***Beryx splendens*** Lowe, 1834

BYS

En - Splendid alfonsino; **Fr** - Béryx long; **Sp** - Alfonsino besugo.

Maximum size to 550 mm standard length; common to 400 mm. Known from northern Gulf of Mexico, Bahamas, southeastern US, and Corner Rising Seamounts. Probably more widespread in the area. Benthopelagic from 25 to 1 240 m. Forms dense aggregations. Russian trawl fishery for this species at Corner Rise Seamounts has landed 19 000 t since 1976.

