

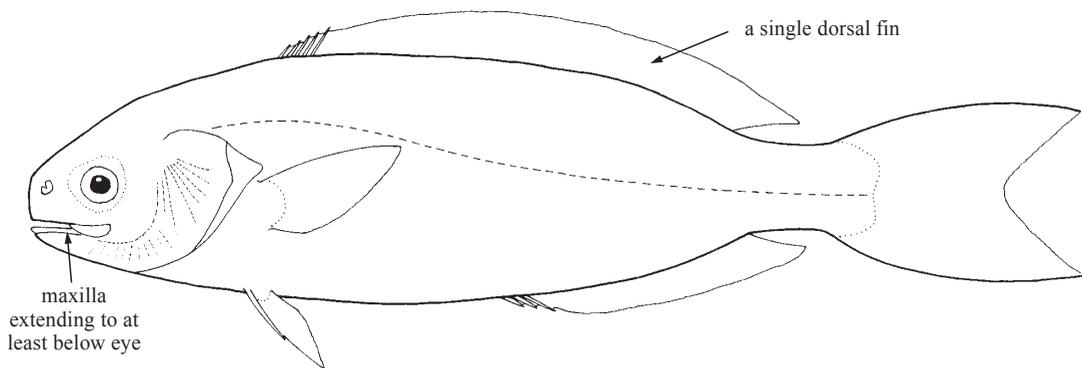
Suborder STROMATEOIDEI

CENTROLOPHIDAE

Medusafishes (ruffs, barrelfish)

by R.L. Haedrich, Memorial University, Newfoundland, Canada

Diagnostic characters: Medium-sized to large (50 to 120 cm) fishes with an elongate to deep body, somewhat compressed but fairly thick; caudal peduncle deep and moderate in length. Snout blunt, longer than or about equal to eye diameter; **mouth large, maxilla extending to at least below eye**; supramaxilla present; **small conical teeth in 1 row in jaws; no teeth on vomer, palatines or basibranchials**; adipose tissue around eyes not conspicuously developed; preopercle margin usually denticulate, but spinulose in most small specimens and in *Schedophilus*; opercle thin, with 2 flat, weak points, the margin denticulate; **7 branchiostegal rays. A single continuous dorsal fin**, its rays preceded by 5 to 9 short, stout spines not graduating to rays (*Hyperoglyphe*) or 3 to 7 thin weaker spines that do graduate to rays (*Schedophilus*); anal fin with 3 spines not separated from rays; **dorsal and anal fins never falcate**, their bases unequal, dorsal longer than anal; pelvic fins inserting under pectoral fin base, attached to the abdomen by a thin membrane and folding into a broad shallow groove; pectoral fins usually not prolonged, broad; caudal fin broad and not deeply forked. Scales moderate to small, usually cycloid (but with small cteni in *Schedophilus medusophagus*) and easily shed; head conspicuously naked and covered with small pores. **Colour:** generally uniformly dark green to grey, or brownish, with an indistinct vertical, or more usually horizontal, pattern of darker irregular stripes; eyes often golden.

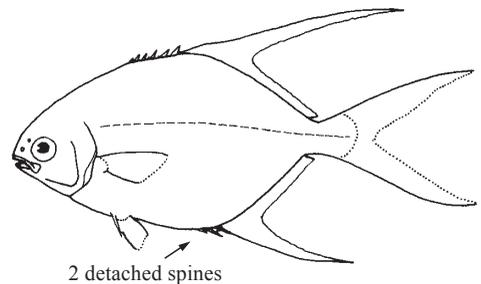


Habitat, biology, and fisheries: Pelagic, mesopelagic, and epibenthic deep-water fishes of warm and temperate seas; often in deep water at the edge of the continental shelf, in submarine canyons or near oceanic islands. Larvae occur in the plankton, and juveniles and young adults commonly associate, often in loose but large schools, with pelagic medusae or floating objects such as boxes or barrels; feed on jellyfish, crustaceans, salps, and small fishes. There is no special fishery for ruffs anywhere in Area 31, but specimens are caught occasionally by sportsfishermen and are highly esteemed for food in some places. Adults of *Hyperoglyphe* live in deep submarine canyons where they are caught on deep lines, and there is an incidental deep-line fishery for *Schedophilus ovalis* in the eastern Atlantic at Madeira.

Remarks: Following the original description from the Gulf of Mexico in 1954, there have been almost no reports concerning *Hyperoglyphe bythites*. It may be a synonym of *H. moselii* = *Leirus moselii* Cunningham 1910, described from St. Helena, South Atlantic Ocean.

Similar families occurring in the area

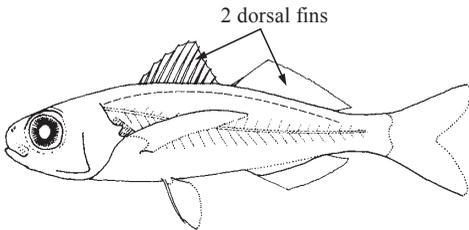
Carangidae: 2 detached stout spines precede anal fin; modified scales often present along posterior portion of lateral line and forming keels or scutes on the caudal peduncle.



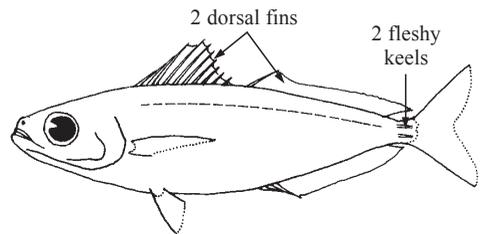
Carangidae

Nomeidae: 2 distinct dorsal fins, the first with about 10 long slender spines; mouth small, teeth present on tongue and roof of mouth.

Ariommatidae: 2 distinct dorsal fins, the first with about 10 long slender spines; mouth small; caudal peduncle very narrow and not compressed, with 2 fleshy keels on each side at base of caudal fin.



Nomeidae



Ariommatidae

Key to the species of Centrolophidae occurring in the area

- 1a. Median fin spines weak, very difficult to distinguish from rays; body soft and limp; dorsal-fin spines plus soft rays 44 to 50, anal-fin spines plus soft rays 28 to 31; gill rakers on lower limb of first arch less than 13 *Schedophilus medusophagus*
- 1b. Median fin spines 5 to 8, strong, easily distinguished; body firm; dorsal-fin soft rays less than 35; anal-fin soft rays less than 27; gill rakers on lower limb of first arch more than 15. → 2
- 2a. Origin of dorsal fin usually before insertion of pectoral fins, but over pectoral-fin insertion in very large specimens; spines only moderately developed and all graduating to rays; body depth usually greater than 35% standard length → 3
- 2b. Dorsal-fin origin over or a little behind pectoral-fin insertion; spines stout, shorter than and not increasing regularly in length to the rays; body depth about 30 to 35% standard length → 4
- 3a. Dorsal-fin soft rays 30 to 32; anal-fin soft rays 20 to 24 *Schedophilus ovalis*
- 3b. Dorsal-fin soft rays 23 to 26; anal-fin soft rays 16 to 19 *Schedophilus pamarco*
- 4a. Dorsal-fin soft rays 19 to 21; eye less than snout length *Hyperoglyphe perciformis*
- 4b. Dorsal-fin soft rays 22 to 25; eye about equal to snout length *Hyperoglyphe bythites*

List of species occurring in the area

- Hyperoglyphe bythites* (Ginsburg, 1954). To perhaps 50 cm. Gulf of Mexico.
- Hyperoglyphe perciformis* (Mitchill, 1818). To 100 cm. Atlantic E coast of the USA from Florida to Nova Scotia, straying to Europe.
- Schedophilus medusophagus* Cocco, 1829. To at least 50 cm, most specimens known are juveniles. Oceanic, N Sargasso Sea, NE Atlantic, and Mediterranean.
- Schedophilus ovalis* (Cuvier, 1833). To 100 cm, commonly 40 to 60 cm. Mediterranean and E N Atlantic, Madeira, Azores, and straying to Bermuda.
- Schedophilus pamarco* (Poll, 1959). To 30 cm. Gulf of Guinea, rarely straying to SE Caribbean.

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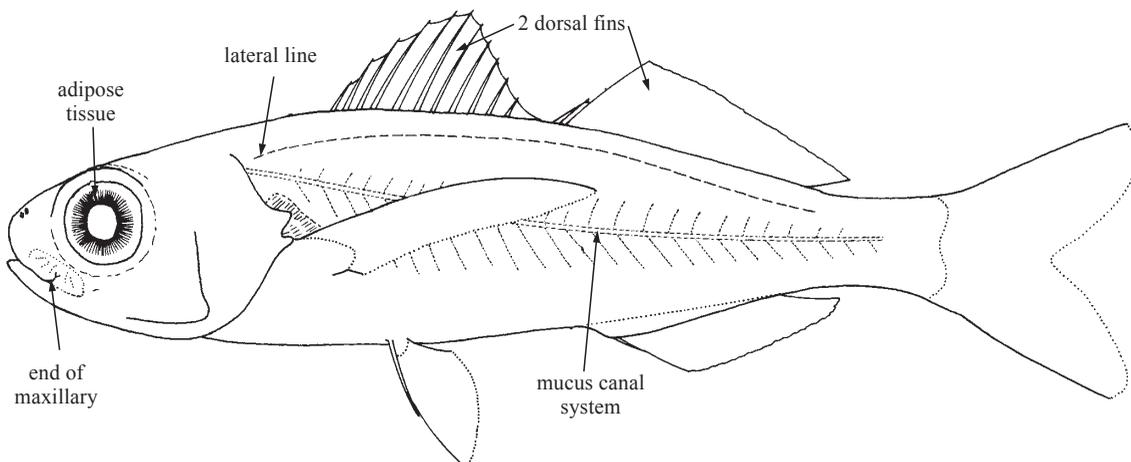
Whitehead, P.J.P., M.L. Bauchot, J.C. Hureau, J. Nielsen, and E. Tortonese. 1986. *Fishes of the North-eastern Atlantic and the Mediterranean*. Centrolophidae. Paris, UNESCO, Vol. 3:1177-1182.

NOMEIDAE

Driftfishes (man-of-war fishes)

by R.L. Haedrich, Memorial University, Newfoundland, Canada

Diagnostic characters: Slender to deep, **laterally compressed oceanic stomateoid fishes** of moderate to large size (20 to 100 cm); in *Psenes* young are quite deep-bodied becoming less so with growth. Adipose tissue around eyes developed in most species; **mouth small, maxilla rarely extending to below eye, supramaxillary absent; teeth small, conical, or cusped (in some *Psenes*), approximately uniserial in the jaws and also present on vomer, palatines (roof of mouth), and basibranchials;** pharyngeal sacs with papillae in upper and lower sections, papillae in about 5 broad longitudinal bands, their bases stellate, teeth seated on top of a central stalk; preopercular margin entire or finely denticulate; operculum very thin, with 2 flat, weak points; **6 branchiostegal rays. Two dorsal fins, the first with about 10 slender spines** folding into a groove, the longest spine at least as long as longest ray of second (soft) dorsal fin; anal fin with 1 to 3 spines, not separated from the soft rays; **soft dorsal- and anal-fin bases approximately the same length and sheathed by scales; pectoral fins become long and almost wing-like with growth, their bases inclined about 45°;** caudal fin forked; pelvic fins often attached to abdomen by thin membrane and fold into a narrow groove, the fins greatly produced and expanded in young *Nomeus* and some *Psenes*. Lateral line high, following dorsal profile and often not extending onto caudal peduncle. **Skin thin; subdermal mucus canal system well developed and visible in most species, main canal down the side of the body may be mistaken for a lateral line;** scales small to large, cycloid (smooth-edged) or with very weak cteni (*Psenes pellucidus*), thin and easily shed. Vertebrae 30 to 33, 41 or 42; caudal skeleton with 4 hypural and 3 epural bones. **Colour:** *Cubiceps* species generally dark blue to brownish dorsally, light-coloured or silvery on sides with no mottling or stripes; may become uniformly dark with age. *Nomeus* bright blue above, with a splotched and mottled blue pattern overlaying the silvery sides; pelvic fins black; large specimens are more uniformly coloured, resembling *Cubiceps*. Young *Psenes* striped or mottled, dark over light, on sides and back, but older ones uniformly dark blue or black.



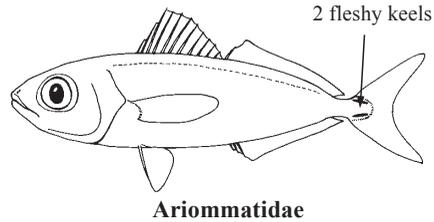
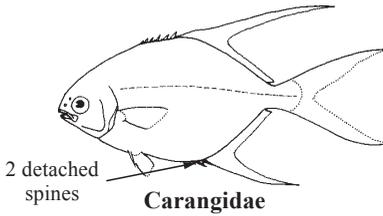
Habitat, biology, and fisheries: Epi- and mesopelagic regions of the high seas and around oceanic islands; the young found in the upper surface layers, adults deeper (some may be deep benthic on the slope). Sometimes found in large aggregations, and most often in association with jellyfish (siphonophores, especially *Physalia*, and medusae). Feed on zooplankton and jellyfishes of all kinds, occasionally taking small fish. There is no fishery for Nomeidae in Area 31.

Remarks: The species in this family of rarely encountered oceanic fishes remain to be adequately worked out, especially in the case of *Nomeus* (presumed monotypic) and *Psenes*. The problem is compounded by the fact that counts are very similar and the appearance and body proportions change considerably with growth. The circumtropical species *Psenes cyanophrys* may comprise a number of species; in Area 31 the name *Psenes chapmani* Fowler, 1906 is available.

Similar families occurring in the area

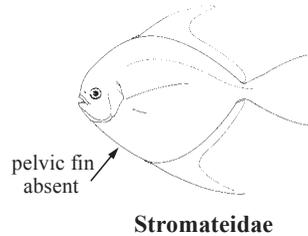
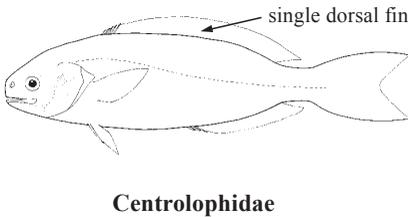
Carangidae: some species similar in shape and colour pattern, but can be distinguished by the 2 heavy spines ahead of the anal fin and by the scutes along the side of the caudal peduncle.

Ariommatidae: body usually rounded (except in *Ariomma regulus*); caudal peduncle very narrow, with 2 fleshy keels on each side of the base of the fin, and no teeth on the roof of the mouth.



Centrolophidae: a single dorsal fin with relatively heavy short spines; mouth large, tip of maxillary usually extending well beyond anterior eye margin; 7 branchiostegal rays (6 in Nomeidae); no teeth on roof of mouth or on basibranchials; pharyngeal sacs with irregularly shaped papillae (bases of papillae stellate in Nomeidae).

Stromateidae: body moderately deep; dorsal fin single, continuous with very few spines (usually only 3 very weak ones); pelvic fins absent; no teeth on roof of mouth.



Key to genera and species of Nomeidae occurring in the area

- 1a. Origin of dorsal fin before, or directly over in large specimens, insertion of pectoral fins; no scales on top of head forward of eyes (Fig. 1a); body usually deep (maximum depth about 2.5 times in length or less), but elongate in large specimens of some species (*Psenes*) → 2
- 1b. Origin of dorsal fin behind or directly over (in small specimens) insertion of pectoral fins; scales on top of head extend forward of eyes (Fig. 1b); body usually elongate (maximum depth more than 3 times in length) → 4
- 2a. Lower jaw teeth pointed or only slightly flattened, similar to those in upper jaw; clear pattern of fine horizontal lines along sides of body (Fig. 2) *Psenes cyanophrys*
- 2b. Lower jaw teeth long, compressed, contiguous, very different from those in upper jaw; body colour mottled or spotted (in young specimens) or uniformly dark brown → 3

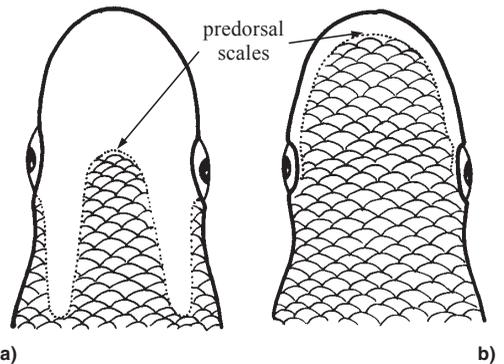


Fig. 1 dorsal view of head

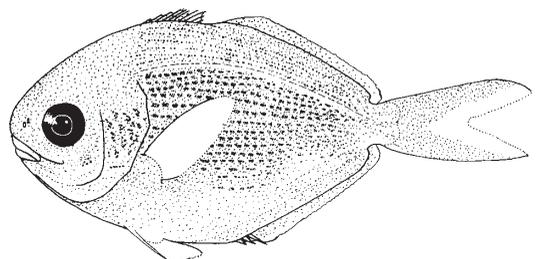


Fig. 2 *Psenes cyanophrys*

- 3a. Second dorsal-fin rays 27 to 32; anal-fin rays 28 to 34; body musculature very soft and flabby, bases of median fins translucent, vertebrae 40 to 42 (Fig. 3) *Psenes pellucidus*
- 3b. Second dorsal-fin rays 18 to 22; anal-fin rays 21 to 23; body musculature firm, bases of median fins not translucent, vertebrae 31 (Fig. 4) *Psenes arafurensis*

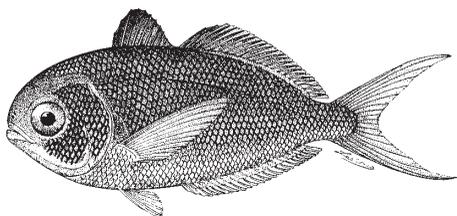


Fig. 4 *Psenes arafurensis*

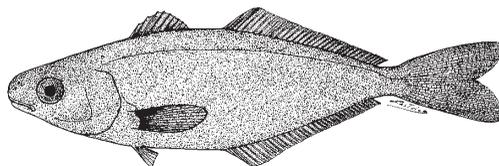


Fig. 3 *Psenes pellucidus*

- 4a. No teeth on tongue; insertion of pelvic fins before or under insertion of pectoral fins (possibly behind in very large specimens); anal fin with 24 to 29 rays and 1 or 2 spines; vertebrae 41 (genus *Nomeus*) (Fig. 5) *Nomeus gronovii*
- 4b. Teeth on tongue; insertion of pelvic fins under end or behind base of pectoral fins; anal fin with 14 to 25 rays and 2 or 3 spines; vertebrae 31 to 34 (*Cubiceps*) → 5

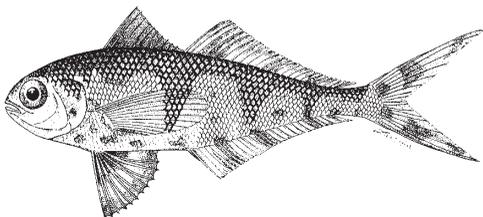


Fig. 5 *Nomeus gronovii* (juvenile)

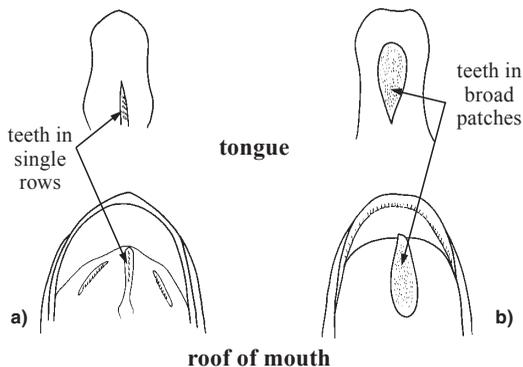


Fig. 6

- 5a. Teeth on tongue and on roof of mouth pointed, in a single median row (Fig. 6a, 7) . *Cubiceps capensis*
- 5b. Teeth on tongue and on roof of mouth knobby, in a broad patch (Fig. 6b) → 6

- 6a. Anal fin with 2 or 3 spines and 19 to 23 soft rays; dorsal-fin rays 21 to 24; vertebrae 32 to 34, usually 33; no thin bony keel on chest *Cubiceps gracilis*
- 6b. Anal fin with 2 spines and 14 to 17 soft rays; dorsal-fin rays 15 to 18; vertebrae 31; conspicuous thin bony keel on chest (Fig. 8) *Cubiceps pauciradiatus*

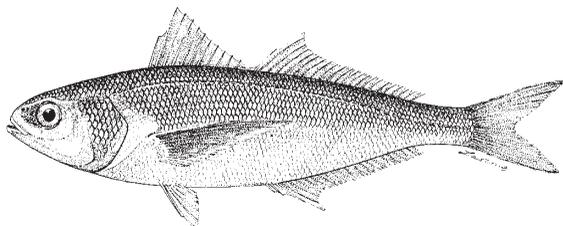


Fig. 7 *Cubiceps capensis*

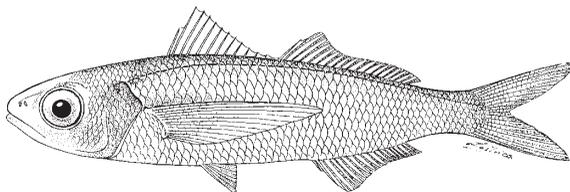


Fig. 8 *Cubiceps pauciradiatus*

List of species occurring in the area

Cubiceps capensis (Smith, 1845). To 100 cm. Sargasso Sea, circumglobal in subtropical waters of all oceans, rarely seen.

Cubiceps gracilis (Lowe, 1843). To 75 cm. NE Sargasso Sea, widespread in warm and temperate waters N of 30°N in the W and 12°N (Canary Current) in the E of the N Atlantic.

Cubiceps pauciradiatus Günther, 1872. To 20 cm. Caribbean, equatorial and central waters of all oceans.

Nomeus gronovii (Gmelin, 1789). To 40 cm. Common in the Caribbean, circumtropical in all oceans.

Psenes arafurensis Günther, 1889. To 25 cm. Circumglobal in warm waters of all oceans.

Psenes cyanophrys Valenciennes, 1833. To at least 20 cm (only immature specimens known). Caribbean and Gulf of Mexico, generally circumglobal in warm waters of all oceans.

Psenes pellucidus Lütken, 1880. To 80 cm. Sargasso Sea, and circumglobal in warm waters of all oceans.

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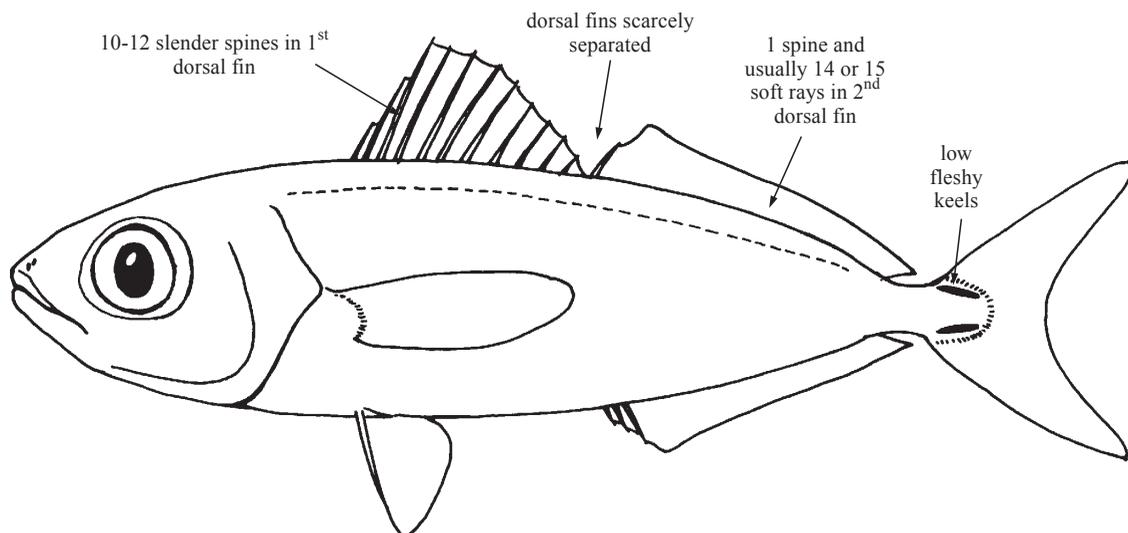
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ARIOMMATIDAE

Ariommas

by R.L. Haedrich, Memorial University, Newfoundland, Canada (after Vergarra, 1978)

D **Diagnostic characters:** Small fishes, to about 20 cm, with body slender or moderately deep, rounded or somewhat compressed; caudal peduncle short and slender, not compressed, its width about equal to its depth; 2 low fleshy keels on each side of caudal peduncle near caudal-fin base. Head long; eye moderate to large, centrally located and surrounded by well-developed adipose tissue extending forward around the nostrils; operculum thin, its margin smooth; gill openings large. Snout short and blunt. Mouth small, end of maxilla before front of eye; upper jaw almost completely covered by preorbital bone when mouth is closed; jaw teeth minute, conical, in a single row; no teeth on vomer, palatines (roof of mouth), or basibranchials; papillae in pharyngeal sacs with flat rounded bases, small teeth seated all along a large central stalk; 6 branchiostegal rays. **Two dorsal fins, scarcely separated; the first dorsal fin with 10 to 12 long slender spines** almost twice as long as any of the rays of the second dorsal fin, depressible into a groove; **second dorsal and anal fins about the same length, each with 14 or 15 (rarely 13 or 16) rays**; caudal fin stiff and markedly forked; pectoral fins not produced; pelvic fins inserting under or behind pectoral-fin base and folding into a broad groove along ventral midline. Lateral line high, following dorsal profile; scales with branched tubes not extending onto caudal peduncle; a branch of the lateral line extending forward in a bony tract arched to over the eye. Scales large, cycloid, very thin, and easily shed, not covering bases of the median fins; top of snout naked, scales extend forward on top of head only to above eye. **Colour:** silvery, with a purple, brown, or blue tinge; adults of deep-bodied species with dark splotches and spots on body; juveniles of all with 3 dark vertical bands.

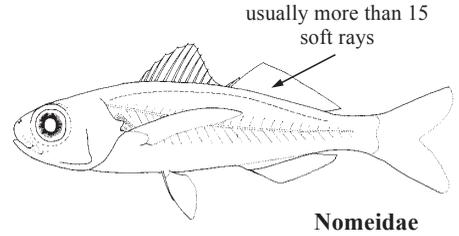


Habitat, biology, and fisheries: Schooling-fishes generally found offshore in deep water over muddy bottoms on the continental shelf and upper continental slope; juveniles occur near the surface. The flesh is rich in fat and is highly esteemed. These fishes have potential as objects of a fishery, but this remains unrealized; experimental fisheries have been conducted off West Africa.

Remarks: All *Ariomma* species (there is only 1 genus in the family) are very similar; fin counts and other meristic data are virtually the same worldwide.

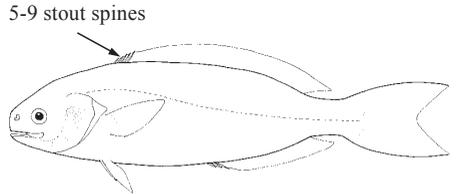
Similar families occurring in the area

Nomeidae (especially species of *Cubiceps*): caudal peduncle compressed and deep, more than 5% of the standard length, lacking low fleshy keels; teeth present on roof of mouth and often on tongue; usually more than 15 soft rays in second dorsal fin.



Nomeidae

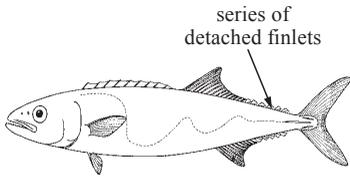
Centrolophidae: 5 to 9 moderately stout spines in first dorsal fin, all shorter than rays of second dorsal fin; mouth large, tip of maxilla usually under posterior half of eye; caudal peduncle deep and compressed, without fleshy keels.



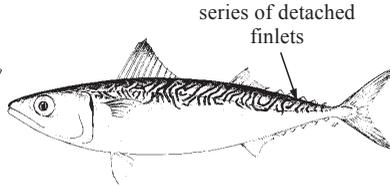
Centrolophidae

Carangidae: 2 detached stout spines preceding anal fin; 3 to 8 spines in first dorsal fin, generally shorter than or equal in length to rays of second dorsal fin; modified scales along posterior portion of lateral line may form a single keel on side of caudal peduncle.

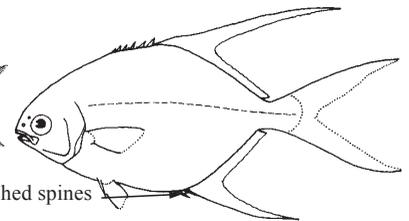
Scombridae and Gempylidae (*Lepidocybium* and *Ruvettus*): snout pointed; base of second dorsal fin shorter than base of first dorsal fin, a series of detached finlets behind the second dorsal and anal fins; teeth prominent.



Gempylidae



Scombridae



Carangidae

Key to the species of Ariommatidae occurring in the area

- 1a. Body somewhat compressed and deep, maximum depth about 2.5 times in length; body with spots *Ariomma regulus*
- 1b. Body rounded and elongate, maximum depth 3 or more times in length; body uniform or dark dorsally and lighter below, without spots → 2
- 2a. Colour pale brown or blue dorsally with a silvery underside, peritoneum pale; lateral-line scales 30 to 45, large; scales on top of head extend only to front of pupil *Ariomma bondi*
- 2b. Colour uniformly dark brown to blackish, peritoneum dark; lateral-line scales 50 to 65, small; scales on top of head extend to front of eye *Ariomma melanum*

List of species occurring in the area

The symbol is given when species accounts are included.

- Ariomma bondi* Fowler, 1930.
- Ariomma melanum* (Ginsburg, 1954).
- Ariomma regulus* (Poey, 1868).

References

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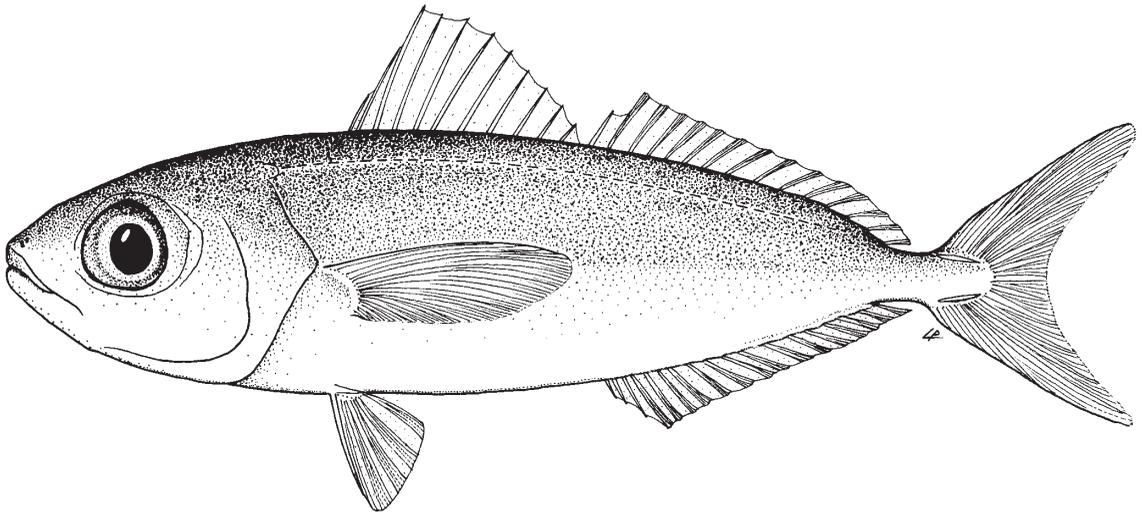
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Ariomma bondi Fowler, 1930

IMB

Frequent synonyms / misidentifications: *Paracubiceps ledanoisi* Belloc, 1937; *Cubiceps nigriargenteus* Ginsburg, 1954; *Ariomma ledanoisi* (Belloc, 1937) / *Ariomma melanum* (Ginsburg, 1954).

FAO names: En - Silverray driftfish (AFS: Silver-rag); Fr - Ariomme grise; Sp - Arioma lucia.

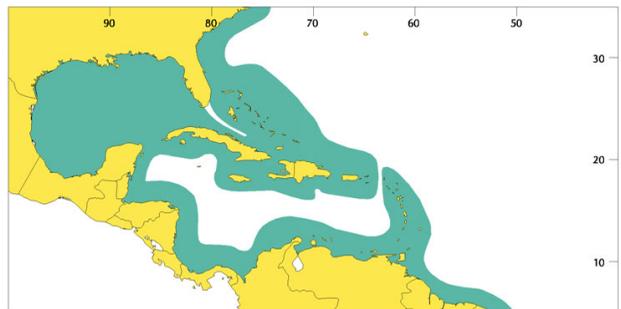


Diagnostic characters: Body elongate, moderately slender, and somewhat compressed; caudal peduncle square in cross-section, its depth less than 5% standard length, with 2 low fleshy keels on each side near caudal-fin base. Eye large, its diameter slightly longer than snout; snout blunt, not rounded; mouth small, end of maxilla scarcely reaching to anterior eye margin; lower jaw slightly projecting beyond the upper; teeth in jaws minute, in a single row, those in lower jaw often with tiny cusps; no teeth on roof or floor of mouth. Two separate dorsal fins, the first higher than the second, with about 11 flexible spines depressible into a groove; pectoral fins not extending beyond vertical from last dorsal-fin spine; pelvic fins inserting under pectoral-fin base and folding into a shallow but prominent groove; caudal fin rigid and deeply forked. Lateral line high, following dorsal profile but with tubed scales not extending onto caudal peduncle; pores and canals of cephalic lateral line only moderately developed. Scales conspicuously large, especially those around midpoint of sides, cycloid (smooth), easily detached, about 30 to 45 in lateral line; scalation on head extending no further forward than anterior border of pupil. Colour: dark blue on back, silvery below, without spots as adults; the young have 3 to 6 dark bars on sides; peritoneum silvery or pale with scattered melanophores.

Size: Maximum 25 cm; common to 20 cm.

Habitat, biology, and fisheries: Demersal or benthopelagic on outer continental shelf, usually over muddy bottoms; taken in 40 to 450 m, but most common above 275 m; juveniles occur in surface waters. Schooling; can be very abundant locally. Feeds mainly on small crustaceans. Caught with bottom trawls; not the object of a directed fishery, but perhaps with potential for development. Marketed fresh and canned in Africa; also used for fish meal and oil. Separate statistics are not kept for this species.

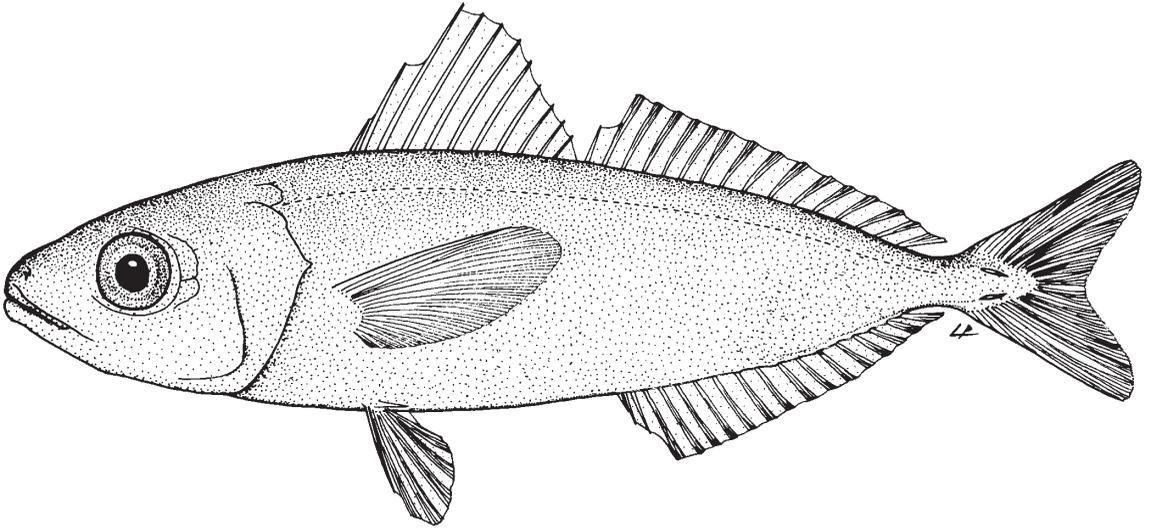
Distribution: Nova Scotia south through the Gulf of Mexico and Caribbean to Uruguay; also tropical West Africa from Senegal to Gabon as a member of the deep sparid subcommunity.



Ariomma melanum (Ginsburg, 1954)

Frequent synonyms / misidentifications: *Paracubiceps multisquamus* Marchal, 1961; *Ariomma multisquamus* (Marchal, 1961) / *Ariomma bondi* Fowler, 1930.

FAO names: En - Brown drifffish; Fr - Ariomme brune; Sp - Arioma parda.

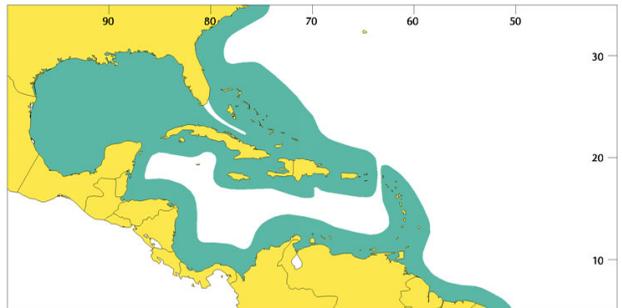


Diagnostic characters: Body elongate, moderately slender and somewhat compressed; caudal peduncle square in cross-section, its depth less than 5% standard length, with 2 low fleshy keels on each side near caudal-fin base. Eye moderate, its diameter equal to or a little less than length of snout; snout blunt, not rounded; mouth small, end of maxilla not reaching to below eye; lower jaw slightly projecting beyond upper; teeth in jaws minute, in 1 row, those in lower jaw often with tiny cusps; no teeth on roof or floor of mouth. Two separate dorsal fins, the first higher than the second, with about 11 flexible spines depressible into a groove; pectoral fins not extending beyond vertical line from last dorsal-fin spine; pelvic fins inserting behind end of pectoral-fin base and folding into a shallow midventral groove; caudal fin rigid and forked. Lateral line high, following dorsal profile but with tubed scales not extending onto caudal peduncle; pores and canals of cephalic lateral line well-developed and conspicuous. Scales relatively small, cycloid (smooth), easily detached, about 50 to 65 in lateral line; scalation on head extending to anterior margin of eye. Colour: uniformly brown or bluish brown, in life sometimes with a silvery cast; the young have 3 to 6 dark bars on sides; peritoneum dark brown to black.

Size: Maximum 25 cm; common to 20 cm.

Habitat, biology, and fisheries: Demersal or benthopelagic in deep water, 140 to 750 m, on the upper continental slope, usually over soft bottoms; juveniles occur in surface waters. Schooling, can be very abundant locally. Feeds mainly on small crustaceans. Caught with deep bottom trawls; marketed fresh and canned; also used for fish meal and oil. Separate statistics are not kept for this species.

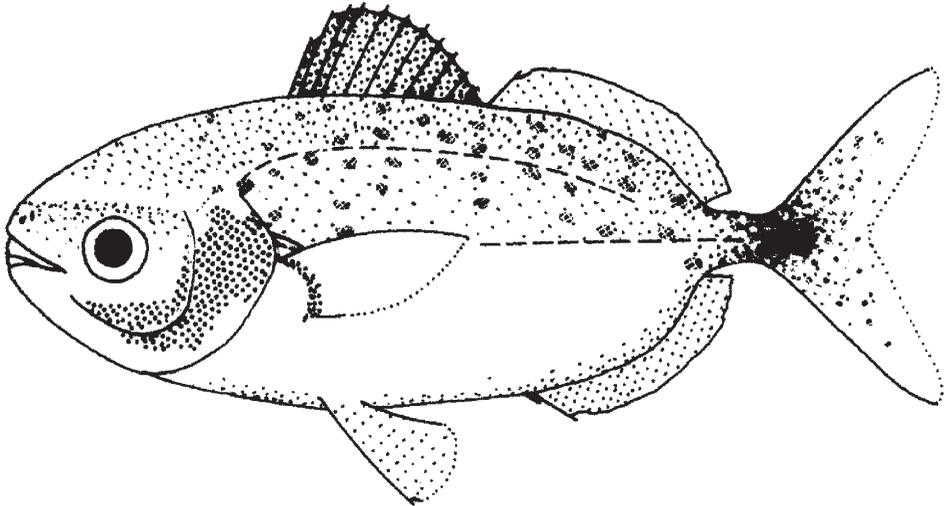
Distribution: New York Bight south through Gulf of Mexico and Caribbean to Panama; also tropical West Africa from Mauritania to Angola as a member of the continental slope community.



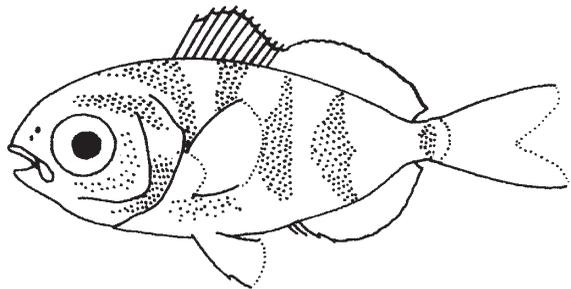
Ariomma regulus (Poey, 1868)

Frequent synonyms / misidentifications: *Psenes regulus* Poey, 1868 / None.

FAO names: En - Spotted driftfish; Fr - Ariomme pintade; Sp - Arioma pintada.



Diagnostic characters: Body deep, moderately elliptical and somewhat compressed, maximum depth about 40% standard length; **caudal peduncle square in cross-section, its depth less than 5% of standard length, with 2 low fleshy keels on each side** at caudal-fin base. Eye moderate, its diameter less than length of snout; **snout rounded**; mouth terminal, small, maxilla not reaching vertical at anterior eye margin; **teeth in jaws minute, pointed, without cusps, in 1 row; no teeth on roof or floor of mouth.**



juvenile

Two separate dorsal fins, the first higher than the second, with about 11 flexible spines depressible into a groove;

caudal fin rigid and deeply forked; pectoral fins not extending beyond vertical from last dorsal-fin spine; pelvic fins inserting behind end of pectoral-fin base and folding into a shallow but prominent groove. Lateral line high, following dorsal profile but with tubed scales not extending onto caudal peduncle; pores and canals of cephalic lateral line only moderately developed. Scales cycloid (smooth), easily detached, about 50 to 60 in lateral line. **Colour:** silvery to light brown generally, slightly darker above midline; back with dark spots in adults; **spinous dorsal fin, pelvic fins, and opercles black**; the young have 3 to 5 dark bars on sides; eyes golden.

Size: Attains about 20 cm.

Habitat, biology, and fisheries: Very little is known about any aspect of the biology of this fish. Development, from barred juveniles to spotted adults, is well described from specimens taken in deep water (200 to 500 m). There is no fishery, and the fish does not seem to occur as significant bycatch anywhere (sporadically taken on shrimp grounds in deeper water).

Distribution: From New Jersey south throughout the Gulf of Mexico and to the Guyanas.

