

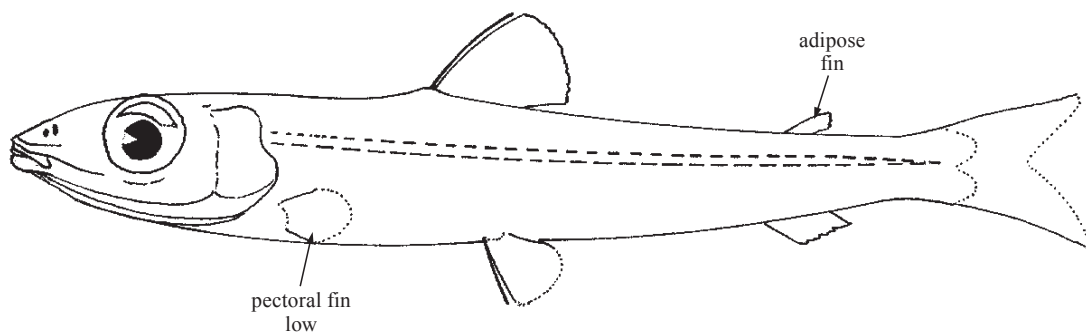
## Order OSMERIFORMES

## ARGENTINIDAE

## Argentines

by J.A. Carter, University of New England, Maine, USA and K.E. Hartel, Harvard University, Massachusetts, USA

**Diagnostic characters:** Small-sized (10 to 70 cm) with elongated, robust body, usually convex head profile, small terminal mouth, ending in front of eye; **teeth absent on premaxillary and maxillary.** A single dorsal fin with soft rays near the midpoint of body, **followed by an adipose dorsal fin on the posterior 1/4 of the body above anal fin; pectoral fin placed low, on the ventrolateral contours of body;** pelvic fins beneath or behind dorsal fin. **No spines in fins; dorsal fin with 10 to 14 rays, anal fin with 10 to 17 rays, pectoral fins with 11 to 25 rays, pelvic fins with 10 to 15 rays.** Swimbladder present, sometimes with bright silvery pigment. Scales cycloid (smooth to touch), easily detached. **Colour:** light straw to silvery-coloured, often iridescent. Usually with a silvery or brownish band along sides.



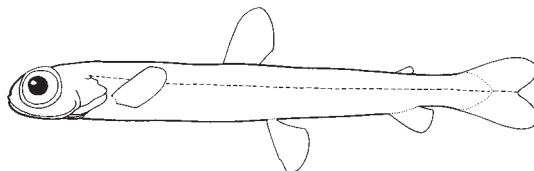
**Habitat, biology, and fisheries:** On the outer shelf and upper slope; pelagic near bottom. Locally abundant in some places, taken in shrimp trawls. Marine, mesopelagic entering bathypelagic environments, demersal from 100 to 1 400 m. Found on soft bottom, mud, gravel, sand, and rock. Some species change colour with age. Feeds on planktonic invertebrates and euphausiids, small fishes. Eggs and larvae pelagic. Only 1 species, *Argentina silus* important to fisheries, used fresh or in fish meal. Atlantic, Indian, and Pacific Oceans.

## Similar families occurring in the area

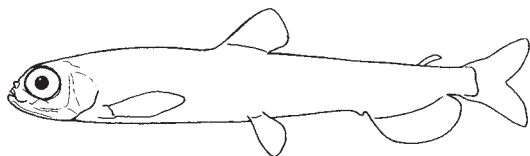
Microstomatidae: pectoral fins high, on sides of body; lateral-line scales extending onto caudal fin.

Bathylagidae: no swimbladder.

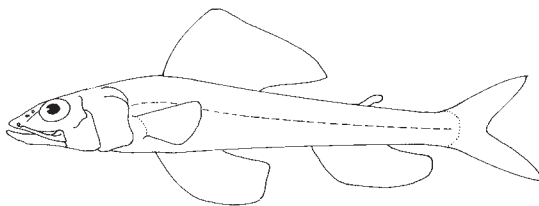
Aulopidae, Chlorophthalmidae, Synodontidae: pectoral fins high on sides of body; teeth (sometimes very small) present on premaxillary.



Microstomatidae



Bathylagidae



Aulopidae

**Key to genera of Argentinidae occurring in the area**

- 1a.** Gill rakers on upper arch 7 or fewer; rakers quite robust and conical . . . . . → **2**
- 1b.** Gill rakers on upper arch 10 or more; rakers thin and long . . . . . → **6**
- 2a.** Lower gill rakers 13 (11 to 15) (not found in area) . . . . . *Argentina silus*
- 2b.** Lower gill rakers 7 or fewer . . . . . → **3**
- 3a.** Lower gill rakers usually 7; vertebrae 45 (44 to 46) . . . . . *Argentina brucei*
- 3b.** Lower gill rakers usually 6; vertebrae 47 to 54 . . . . . → **4**
- 4a.** Body oval in cross-section; depth 8.2 (6.4 to 10.3) in standard length; pectoral-fin rays 19 (18 to 21); caudal peduncle depth 5.2 (4.4 to 6.0) in head length; vertebrae 49 (47 to 51); swimbladder usually with definite silvery pigment or iridescence; always lacking ventral black pigment except on chin . . . . . *Argentina striata*
- 4b.** Body square in cross-section; swimbladder lacking silvery pigment, sometimes iridescent. . . . . → **5**
- 5a.** Body depth 9.5 ((7.4 to 12.0) in standard length; pectoral-fin rays 17 (16 to 19); caudal peduncle 6.4 (5.6 to 7.3) in head length; vertebrae 48 (47 to 50); always with ventral black pigment between pectoral and pelvic fins . . . . . *Argentina georgei*
- 5b.** Body depth 11.8 (9.1 to 13.6) in standard length; pectoral-fin rays 20 (19 to 21); caudal peduncle 6.0 (5.5 to 7.1) in head length; vertebrae 52 or 53; always with ventral black pigment between pectoral and pelvic fins . . . . . *Argentina stewarti*
- 6a.** Caudal peduncle shallow, depth equal to or less than half of distance from vent to anal-fin origin; lateral-line scales 48 to 50; pectoral-fin rays 19 to 22 . . . . . *Glossanodon polli*
- 6b.** Caudal peduncle deep, depth equal to or greater than distance from vent to anal-fin origin; lateral-line scales 43 to 46; pectoral-fin rays 12 to 14. . . . . *Glossanodon pygmaeus*

**List of species occurring in the area**

*Argentina brucei* Cohen and Atsides, 1969. To 15 cm. W C Atlantic.

*Argentina georgei* Cohen and Atsides, 1969. To about 15 cm SL. Florida to Nicaragua, Antilles.

*Argentina stewarti* Cohen and Atsides, 1969. To about 17 cm SL. W Atlantic off Nicaragua, Antilles.

*Argentina striata* (Goode and Bean, 1896. To 21 cm. Temperate to tropical W Atlantic.

*Glossanodon pygmaeus* Cohen, 1958. To about 11 cm SL. Gulf of Mexico to Brazil.

**References**

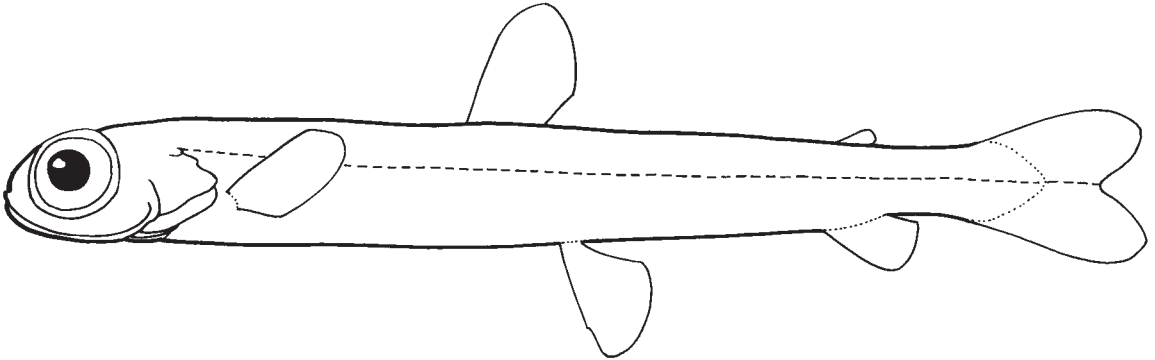
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**MICROSTOMATIDAE**

**Microstomatids**

by J.A. Carter, University of New England, Maine, USA and K.E. Hartel, Harvard University, Massachusetts, USA

**Diagnostic characters:** Small-sized (10 to 21 cm) with slender body. **Eye large, more than twice the length of snout;** small terminal mouth; mesocoracoid absent; orbitosphenoid present. **No spines in fins;** dorsal fin well behind midpoint of body; adipose fin present or absent; pectoral-fin base on side. **Lateral line and lateral-line scales extending onto tail.** **Colour:** body silvery, dark near tail.

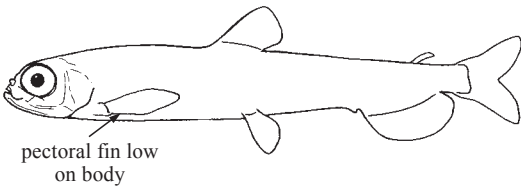


**Habitat, biology, and fisheries:** Mesopelagic to bathypelagic, marine, deep water, solitary, feeds on zooplankton. Of no interest to commercial fisheries. Atlantic, Pacific and Indian Oceans. Tropical and subtropical seas, western Atlantic Gulf of Mexico region.

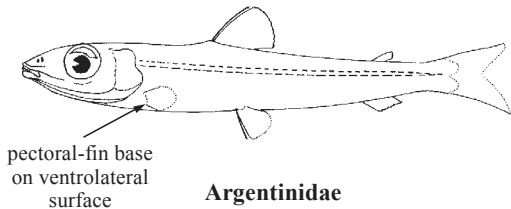
**Similar families occurring in the area**

Bathylagidae: pectoral fin low on body.

Argentinidae: pectoral-fin base on ventrolateral surface.



**Bathylagidae**



**Argentinidae**

**Key to the genera of Microstomatidae occurring in the area**

- 1a. Eyes of adults tubular, directed forward . . . . . *Xenophthalmichthys*
- 1b. Eyes of adults non-tubular, lateral . . . . . → 2
- 2a. Dorsal adipose fin absent; ventral fins inserted ahead of dorsal-fin origin . . . . . *Microstoma*
- 2b. Dorsal adipose fin present; ventral fins inserted behind dorsal-fin origin. . . . . *Nansenia*

**List of species occurring in the area**

- Microstoma microstoma* (Risso, 1810). To 21 cm SL. Temperate and tropical Atlantic.
- Nansenia longicauda* Kawaguchi and Butler, 1984. To about 13 cm SL. Tropical to temperate Atlantic.
- Nansenia megalopa* Kawaguchi and Butler, 1984. To 14 cm SL. Tropical Atlantic.
- Nansenia pelagica* Kawaguchi and Butler, 1984. To 11 cm SL. Tropical to subtropical Atlantic and Pacific.
- Xenophthalmichthys danae* Regan, 1925. To 10 cm SL. Rare, tropical and temperate Atlantic and Pacific.

**References**

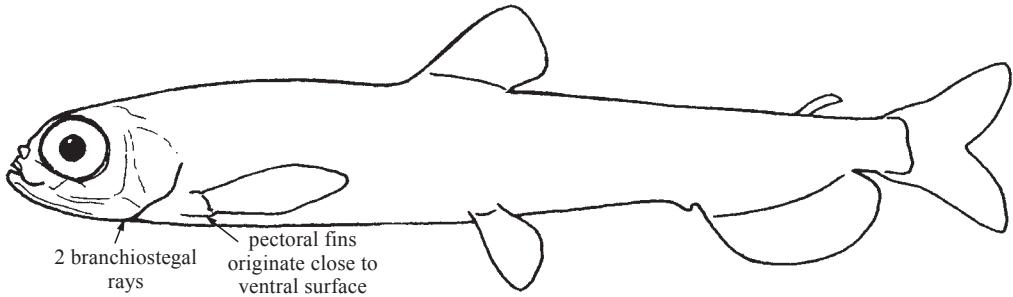
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**BATHYLAGIDAE**

**Deepsea smelts**

by J.A. Carter, University of New England, Maine, USA and K.E. Hartel, Harvard University, Massachusetts, USA

**Diagnostic characters:** Small-sized (10 to 20 cm), with elongated body, convex head profile, and terminal mouth with more or less normal large eyes. **Branchiostegal rays 2.** Fins without spines; dorsal-fin rays 6 to 13, anal-fin rays 10 to 28, pectoral-fin rays 7 to 16. Adipose fin present or absent; pectoral-fin base near ventral surface; **swimbladder absent; no orbitosphenoid.** **Pectoral fins originating close to ventral surface of body.** **Colour:** head and body range from pale, straw-coloured, to jet black.



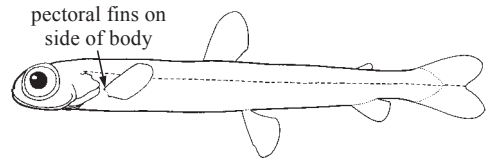
**Habitat, biology, and fisheries:** Marine, mesopelagic, entering bathypelagic environments (25 to 1 000 m). Feed on plankton. Oviparous, with planktonic eggs and larvae. Of little or no interest to fisheries. Atlantic, Pacific, and Indian Oceans.

**Similar families occurring in the area**

Microstomatidae: lateral line and scales extending onto tail; pectoral fins on side of body.

Argentinidae: swimbladder present.

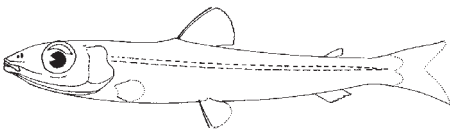
Platyroctidae: shoulder sac produces luminous fluid; canal system subcutaneous.



**Microstomatidae**



**Platyroctidae**



**Argentinidae**

**Key to the species of Bathylagidae occurring in the area**

After MCZ specimens, Koblyansky (1985) and Cohen (1964).

- 1a. Body tan in colour; appears scaleless but light-coloured scale pockets may be present . . . . . → 2
- 1b. Body dark in colour; scaled or with ragged, dark scale pockets . . . . . → 4
  
- 2a. Anal-fin soft rays 18 to 21. . . . . *Dilicholagus longirostris*
- 2b. Anal-fin soft rays less than 18 . . . . . → 3
  
- 3a. Anal-fin soft rays 15 or 16; gill rakers 23 or 24; about 4 small gill rakers present on first epibranchial; eastern Atlantic . . . . . *Bathylagoides argyrogaster*
- 3b. Anal-fin soft rays 11 or 12; gill rakers 25 to 27 (usually 26); small gill rakers absent on back of first epibranchial; western Atlantic . . . . . *Bathylagichthys greyae*

- 4a. Eye large (8.8 to 13% of standard length); about 40 lateral-line scales; in adults, predorsal length usually reaches posterior tip of adipose fin when stepped back from dorsal-fin origin; mandibular pores not obvious . . . . . *Bathylagus euryops*
- 4b. Eye smaller (5.9 to 8% of standard length); about 50 lateral-line scales; in adults, predorsal length usually only reaches anterior base of adipose fin mandibular pores large and very obvious . . . . . *Melanolagus bericoides*

**List of species occurring in the area**

*Bathylagichthys greyae* (Cohen, 1958). To 16 cm SL. Rare, usually tropical to subtropical Atlantic.

*Bathylagoides argyrogaster* (Norman, 1930). To 11 cm SL. Tropical to temperate in E Atlantic, W of 30°W, not in area E of 25°W.

*Bathylagus euryops* Goode and Bean, 1896. Temperate to boreal, usually N of 35°N Atlantic.

*Dilicholagus longirostris* (Maul, 1948). To 18 cm SL. Widespread, tropical to temperate in area.

*Melanolagus bericoides* (Borodin 1929). To 20 cm SL. Widespread, tropical to temperate in Pacific and Atlantic oceans.

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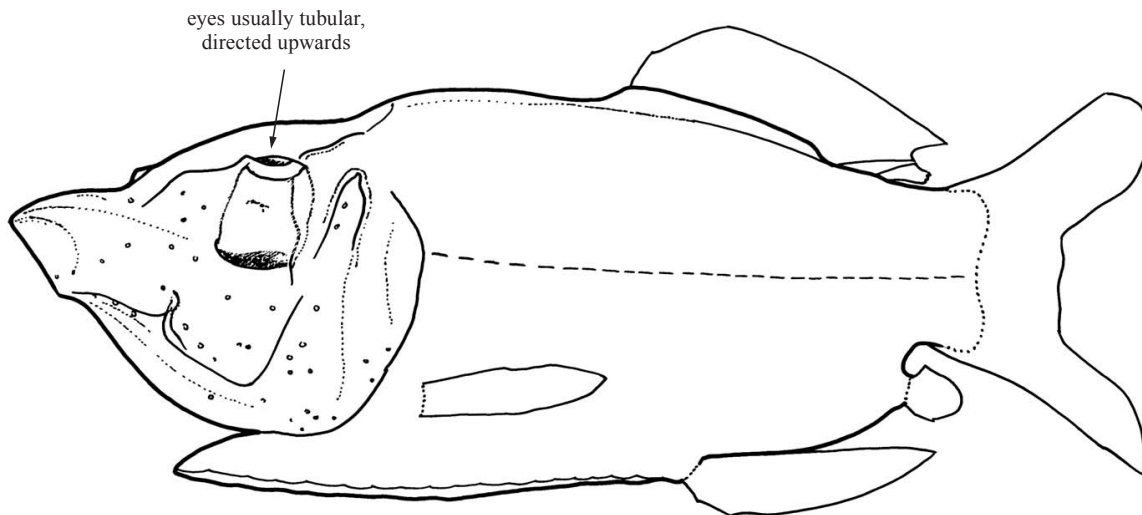
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**OPISTHOPROCTIDAE**

**Barreleyes (spookfishes)**

by J.A. Carter, University of New England, Maine, USA and K.E. Hartel, Harvard University, Massachusetts, USA

**Diagnostic characters:** Small-sized (18 to 24 cm) with slender to somewhat compressed, deep body, large head with short to moderate snout. **Eyes usually tubular, directed upward.** **Two to 4 branchiostegal rays.** Pectoral-fin base inserted on lower side; pelvic-fin base on side in some; adipose fin in some; photophores in some; most lack swimbladder. **Colour:** silvery in *Opisthoproctus* and various shades of brown in other genera.



**Habitat, biology, and fisheries:** Mesopelagic to bathypelagic, marine, 300 to 2 000 m; oviparous; feeds mainly on small crustaceans, mostly copepods. Eggs and larvae pelagic. No fishery. Atlantic, Indian and Pacific Oceans.

**Similar families occurring in the area**

None.

**Key to the genera of Opisthoproctidae occurring in the area**

(modified from Heemstra and Smith, 1986 and Cohen, 1984)

- 1a. Body laterally compressed and moderately to extremely short . . . . . → 2
- 1b. Body subcylindrical and elongate . . . . . *Dolichopteryx*
- 2a. Belly with a flattened scaly ventral sole from head to anus; anus behind ventral-fin base  
 . . . . . *Opisthoproctus*
- 2b. Belly without ventral sole; anus between ventral-fin bases . . . . . → 3
- 3a. Snout relatively short, about equal to orbit width . . . . . *Winteria*
- 3b. Snout relatively long, longer than orbit width . . . . . *Rhynchoyalus*

**List of species occurring in the area**

*Dolichopteryx binocularis* Beebe, 1932. To about 24 cm SL. Circumtropical.

*Dolichopteryx brachyrhynchus* Parr, 1937. Tropical W Atlantic.

*Dolichopteryx longipes* (Vaillant, 1888). To 8 cm SL. Circumtropical.

*Opisthoproctus grimaldii* Zugmayer, 1911. To about 18 cm SL. Tropical to subtropical Atlantic and Pacific.

*Opisthoproctus soleatus* Vaillant, 1888. To 11 cm SL. Temperate to tropical, circumglobal.

*Rhynchohyalus natalensis* (Gilchrist and von Bonde, 1924). To 16 cm SL. Temperate to tropical Atlantic.

*Winteria telescopa* Brauer, 1901. To 15 cm SL. Tropical, circumglobal.

**References**

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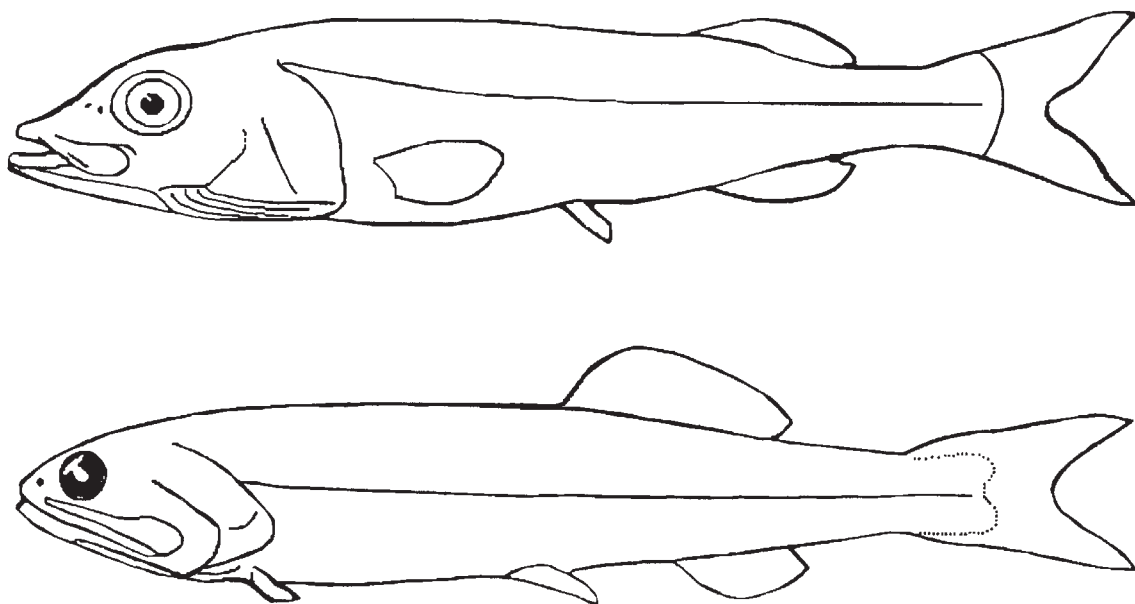


## ALEPOCEPHALIDAE

## Slickheads

by J.A. Carter, University of New England, Maine, USA and K.E. Hartel, Harvard University, Massachusetts, USA

**Diagnostic characters:** Small to medium-sized (40 to 80 cm) with body shape variable, from moderately deep to elongate and eel-like. Head shape compressed to slightly rounded with a large mouth. Tongue present, but usually without teeth; roof and floor of mouth usually with papillae; dentition of jaw and roof of mouth variable, but **premaxilla and mandible usually toothed; no premaxillary tusks. Head without scales;** papillae and raised sensory pores frequently present on head and opercles; **opercles frequently voluminous**, sometimes covering pectoral-fin base. Gill rakers moderate to long, with small tooth-like structures. **No spinous fin rays;** single dorsal and anal fins variable in position, usually placed far back and frequently opposite each other; **no adipose fin;** pectoral fins, if present, moderately high on body; **pelvic fins abdominal**, outer soft ray sometimes with supporting splint bone. **Lateral line present or absent, if present composed of pored scales**, a pored tube supported by ring-like scales, or papillae. Scales on body present or absent, if present always cycloid (smooth to touch), easily abraded. Naked forms usually with black integument and nodular photophores or papillae on body. No dark tube above pectoral fin. **Colour:** usually drab, predominantly brown to black, but 1 group of genera with bright blue skin on head and fin bases.



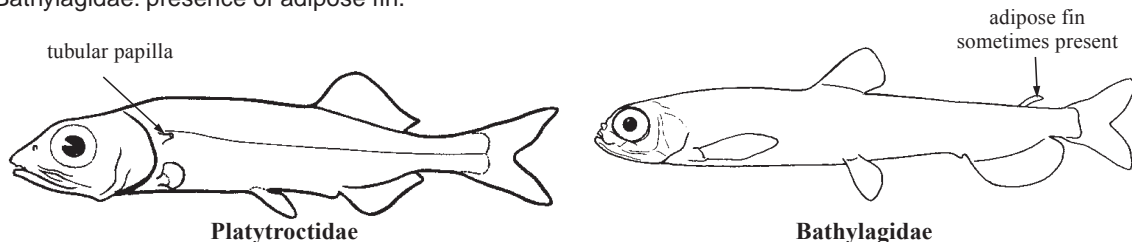
**Habitat, biology, and fisheries:** Deep-sea fishes, habitat variable from benthic to midwater, bathydemersal (600 to 5 000 m), most numerous below 1 000 m. Feeds on wide range of food items including ctenophores, crustaceans, echinoderms, polychaetes, decapods, tunicates, and fishes. At present, slickheads have no economic importance in the western central Atlantic. Some species are known to congregate in commercial-sized quantities in the North Atlantic. The flesh, though mild, is of poor texture. Some potential exists for commercial fishery.

**Distribution:** Eastern and western Atlantic, western Indian, eastern and western Pacific Oceans. Worldwide from tropics to high latitudes.

**Similar families occurring in the area**

Platyroctidae: luminous sack present at shoulder girdle which exits through a dark tubular papilla above the pectoral fin; many with prominent, anteriorly-directed premaxillary tusks.

Bathylagidae: presence of adipose fin.



**Key to the genera of Alepocephalidae occurring in the area**

1a. Body completely scaleless (except for modified lateral-line scales in 1 genus) . . . . . → 2

1b. Body entirely or partly scaled . . . . . → 7

2a. Lateral line in a tube supported by modified ring-like scales standing on edge; anal-fin rays 18 to 22 (Fig. 1) . . . . . *Rouleina*

2b. Lateral line, if present, without modified scales above . . . . . → 3

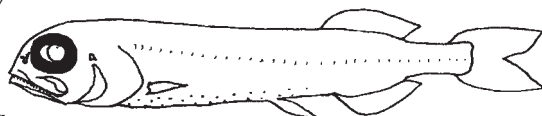


Fig. 1 *Rouleina*

3a. Photophores present on body . . . . . → 4

3b. No photophores on body . . . . . → 5

4a. Photophores on raised stalks; ventral outline of upper jaw with obtuse angle at end of premaxilla; anal-fin soft rays 16 to 19 (Fig. 2) . . . . . *Photostylus*

4b. Photophores nodular, not on stalks; ventral outline of premaxilla and maxilla approximately straight; anal-fin soft rays 26 to 33 (Fig. 3) . . . . . *Xenodermichthys*



Fig. 2 *Photostylus*

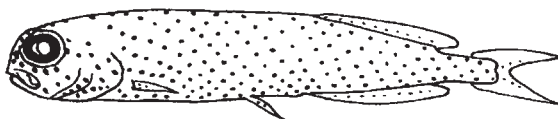


Fig. 3 *Xenodermichthys*

5a. Dorsal-fin origin distinctly behind anal-fin origin; body tapers to a fine, almost stringy point (Fig. 4) . *Leptoderma*

5b. Dorsal-fin origin above or before anal-fin origin; body not tapering to a point . . . . . → 6



Fig. 4 *Leptoderma*

- 6a. Dorsal-fin origin approximately opposite anal-fin origin; no teeth in jaws or mouth (Fig. 5) . . . . . *Mirognathus*
- 6b. Dorsal-fin origin before anal-fin origin; teeth present in both jaws and on roof of mouth (Fig. 6) . . . . . *Rinoctes*



Fig. 5 *Mirognathus*



Fig. 6 *Rinoctes*

- 7a. No teeth on maxilla or vomer . . . . . → 8
- 7b. Teeth present on maxilla and/or vomer. . . . . → 11
- 8a. Dorsal-fin origin usually above anal-fin origin; area from gill cavity to pectoral base scaled; pectoral fin not fan-like, upper-rays longer than lower (Fig. 7) . . . . . *Alepocephalus*
- 8b. Dorsal-fin origin usually behind anal-fin origin; area from gill cavity to pectoral base naked or with naked strip; pectoral fin fan-like in some with upper and lower rays shortened . . . . . → 9



Fig. 7 *Alepocephalus*

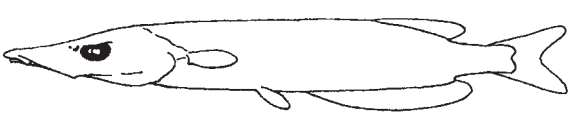


Fig. 8 *Conocara*

- 9a. Lower jaw ends under orbit; palatine bones (on roof of mouth) with teeth; body cavity lining darkly pigmented (Fig. 8) . . . . . *Conocara*
- 9b. Lower jaw ends behind posterior margin of orbit; no teeth on roof of mouth; body cavity lining unpigmented or slightly pigmented. . . . . → 10
- 10a. Fin ray counts: dorsal 15 to 19, anal 15 to 20, pectoral 14 to 18 (Fig. 9) . . . . . *Asquamiceps*
- 10b. Fin ray counts: dorsal 22 to 27, anal 26 to 34, pectoral 9 to 10 (Fig. 10) . . . . . *Einara*



Fig. 9 *Asquamiceps*



Fig. 10 *Einara*

- 11a. Lower jaw without teeth (Fig. 11) . . . . . *Herwigia*
- 11b. Lower jaw with teeth . . . . . → 12



Fig. 11 *Herwigia*

- 12a. Dorsal-fin origin approximately opposite anal-fin origin. . . . . → 13
- 12b. Dorsal-fin origin before anal-fin origin . . . . . → 14

- 13a. Body elongate; pectoral fin reduced; upper jaw with relatively long pointed teeth; no spot near base of dorsal-fin ray (Fig. 12) . . . . . *Bathypriion*
- 13b. Body moderately deep; pectoral fin well developed, often with produced rays; upper jaw without long fang-like teeth; a black wart-like spot near base of sixth dorsal-fin ray, often abraded (Fig. 13) . . . . . *Talismania*

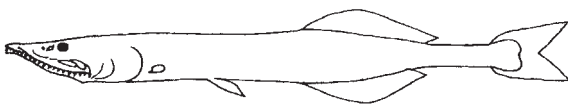


Fig. 12 *Bathypriion*



Fig. 13 *Talismania*

- 14a. Teeth near anterior tips of upper and lower jaws in more than 1 series (Fig. 14) . . . . . *Narcetes*
- 14b. Teeth near anterior tips of upper and lower jaws in single series . . . . . → 15



Fig. 14 *Narcetes*

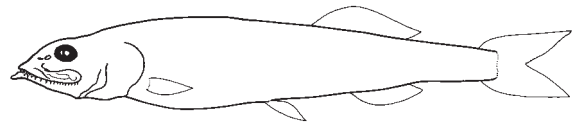


Fig. 15 *Bajacalifornia*

- 15a. Lower jaw with a prominent pointed knob directed ventrally (Fig. 15) . . . . . *Bajacalifornia*
- 15b. Lower jaw without a prominent knob . . . . . → 16

- 16a. Upper jaw ends well behind posterior margin of orbit (Fig. 16) . . . . . *Bathylaco*
- 16b. Upper jaw ends approximately below posterior margin of orbit; pointed knob on lower jaw (Fig. 17) . . . . . *Bathytroctes*



Fig. 16 *Bathylaco*



Fig. 17 *Bathytroctes*

### List of species occurring in the area

- Alepocephalus agassizii* Goode and Bean, 1883. Boreal to temperate Atlantic.  
*Alepocephalus australie* Barnard, 1923. Temperate, circumglobal.  
*Alepocephalus bairdii* Goode and Bean, 1879. Temperate N Atlantic.  
*Alepocephalus productus* Gill, 1883. Subtropical to temperate, circumglobal.  
*Asquamiceps caeruleus* Markle, 1980. Tropical, Indian and Atlantic oceans.  
*Bajacalifornia megalops* (Lütken, 1898). Tropical to temperate, all oceans.  
*Bathylaco nigricans* Goode and Bean, 1896. Temperate and tropical, circumglobal.  
*Bathyrion danae* Marshall, 1966. Temperate and tropical Atlantic, W Pacific.  
*Bathytroctes macrolepis* Günther, 1887. Temperate and tropical Atlantic.  
*Bathytroctes michaelsarsi* Koefoed, 1927. Temperate and tropical Atlantic.  
*Bathytroctes microlepis* Günther, 1878. Tropical and temperate, all oceans.  
*Bathytroctes oligolepis* Krefft, 1970. Temperate and tropical Atlantic.  
*Bathytroctes squamosus* Alcock, 1890. Tropical Atlantic and Indian oceans.  
*Conocara macropterum* Vaillant, (1888). Temperate and tropical Atlantic.  
*Conocara murrayi* (Koefoed, 1927). Temperate and tropical, circumglobal.  
*Conocara salmoneum* (Gill and Townsend, 1897). Temperate Atlantic and Pacific.  
*Einara edentula* (Alcock, 1892). Temperate and tropical, all oceans.  
*Herwigia krefftii* (Nielsen and Larsen, 1970). Temperate and tropical, Atlantic and Pacific.  
*Leptoderma macrops* Vaillant, 1886. Temperate and tropical Atlantic.  
*Mirognathus normani* Parr, 1951. Temperate, N and S Atlantic.  
*Narctes stomias* (Gilbert, 1890). Temperate and tropical, circumglobal.  
*Photostylus pycnopterus* Beebe, 1933. Temperate and tropical, circumglobal.  
*Rinoctes nasutus* (Koefoed, 1927). Temperate and tropical N Atlantic.  
*Rouleina attrita* (Vaillant, 1888). Temperate and tropical, circumglobal.  
*Rouleina maderensis* Maul, 1948. Tropical, circumglobal.  
*Talismania antillarum* (Goode and Bean, 1896). Tropical, circumglobal.  
*Talismania homoptera* (Vaillant, 1888). Tropical N Atlantic.  
*Talismania mekistonema* Sulak, 1975. Tropical, Atlantic and Indian oceans.  
*Xenodermichthys copei* (Gill, 1884). Temperate and tropical, circumglobal.

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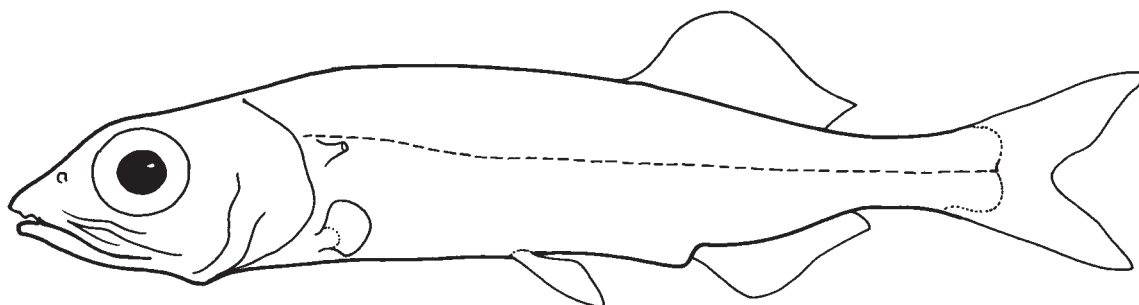
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**PLATYROCTIDAE**

**Tubeshoulders**

by J.A. Carter, University of New England, Maine, USA and K.E. Hartel, Harvard University, Massachusetts, USA

**Diagnostic characters:** Small-sized (10 to 30 cm) with slender to highly compressed body, tissue often soft, terminal mouth with slightly convex head profile. Four to 8 branchiostegal rays. Fourteen to 28 pectoral-fin soft rays; pelvic-fin rays absent in *Platyroctes apus*. **Canal system subcutaneous connected to scale pockets by pores**; swimbladder absent. **Shoulder sac apparatus (behind shoulder girdle) produces luminous fluid**; light organs present in many species (directed ventrally in adults). **Colour:** black to dark brown.



**Habitat, biology, and fisheries:** Marine, deep water, mesopelagic, bathypelagic to benthopelagic; 100 to 2 000 m most common between 300 and 1 000 m. Of no commercial interest to fisheries. All oceans except Mediterranean. Range in western Atlantic 35°N to 5°N, 84°W to 40°W.

**Similar families occurring in the area**

Alepocephalidae: lacks shoulder tube.



**Alepocephalidae**

**Key to the genera of Platyroctidae occurring in the area**

- 1a. Body deep and strongly compressed, upper and lower margins forming a keel; predorsal margin sharp, 1 scale wide . . . . . *Platyroctes*
- 1b. Body shallow to deep, moderately compressed to round in cross-section, upper and lower keels shallow or absent; predorsal margin more than 1 scale wide . . . . . → 2
- 2a. Dentary with a gap in teeth caused by lower jaw ligament; vomerine teeth well separated; lateral scales large, about 45 to 55. . . . . *Barbantus*
- 2b. Dentary without a gap in teeth or ligament; vomerine teeth closely spaced; lateral scales smaller, usually more than 55 (except *Pellisolus*). . . . . → 3
- 3a. Cleithral symphysis normal, not a spine; pelvic-fin rays usually 9 (except 6 to 8 in *Searsia*) . . . . . → 4
- 3b. Cleithral symphysis produced as a spine (except in *Pellisolus*); pelvic-fin rays 6 to 8 . . . . . → 6

- 4a. Maxilla ending between mideye and posterior margin of eye; pelvic-fin rays 6 to 8; 1/4 or less of dorsal fin in advance of anal-fin origin . . . . . *Searsia*
- 4b. Maxilla ending behind eye; pelvic-fin rays 8 or 9 (usually 9); 1/3 or more of dorsal fin in advance of anal-fin origin . . . . . → 5
- 5a. Premaxillary tusks absent or rudimentary . . . . . *Sagamichthys*
- 5b. Premaxillary tusks present . . . . . *Holtbyrnia*
- 6a. Frontals widest over mideye. . . . . *Maulisia*
- 6b. Frontals widest over posterior end of eye to behind eye . . . . . → 7
- 7a. Body compressed, dorsal margin relatively sharp; anal and dorsal fins nearly opposed . *Normichthys*
- 7b. Body moderately compressed, dorsal margin rounded; dorsal-fin ahead of anal-fin origin by 1/4 to 1/3 of its base . . . . . *Pellisolus*

#### List of species occurring in the area

*Barbantus curvifrons* (Roule and Angel, 1931). To 13 cm SL. Temperate to tropical Atlantic.

*Barbantus elongatus* Krefft, 1970. To 18 cm SL. Tropical Atlantic.

*Holtbyrnia anomala* Krefft, 1980. To 25 cm SL. Boreal to tropical Atlantic.

*Holtbyrnia innesi* (Fowler, 1934). To 24 cm SL. Temperate and tropical Atlantic and Pacific.

*Holtbyrnia macrops* Maul, 1957. To 20 cm SL. Temperate and tropical Atlantic.

*Maulisia maui* Parr, 1960. To 20 cm SL. Temperate to tropical Atlantic.

*Maulisia microlepis* Sazonov and Golovan, 1976. To 26 cm SL. Temperate Atlantic.

*Normichthys operosus* Parr, 1951. To 16 cm SL. Boreal to tropical Atlantic.

*Pellisolus facilis* Parr, 1951. To about 13 cm SL. Circumtropical.

*Platyproctes apus* Günther, 1978. To 18 cm SL. Temperate and tropical, circumglobal.

*Sagamichthys schnakenbecki* (Krefft, 1953). To 27 cm SL. Boreal to tropical Atlantic.

*Searsia koefoedi* Parr, 1937. To 15 cm SL. Boreal to tropical, all oceans.

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