

Acromycter perturbator* (Parr, 1932)*Congridae**

No common name



Range: Western North Atlantic Ocean from southern New England (Hudson Canyon and near Georges Bank), the Bahamas and Jamaica

Habitat: Found in depths of 787–1,318 m; this species is the deepest-living western North Atlantic congrid

Spawning: Unknown, possibly year-round; leptocephali not yet collected from study area; included here because adults occur in study area

Eggs: – Undescribed

Larvae:

- Body elongate; tail sharply pointed
- Gut with 10 prominent loops; anus situated at about 75% of length
- Dorsal fin relatively short; origin about 10–15 myomeres posterior to anus
- Head and snout fairly sharply pointy; dorsal profile in small larvae concave
- Midline pigment includes 3 prominent spots posterior to anus, 2 just below midline, 1 just above
- Gut pigment features a prominent patch on each gut loop
- Head pigment lacking
- Maximum leptocephalus size 183 mmSL

Meristic Characters

Myomeres: 159–162
 Vertebrae: 159–162
 Dorsal fin rays: 230 (n = 1)
 Anal fin rays: 190–200 (n = 1)
 Pectoral fin rays: 10–11
 Pelvic fin rays: none

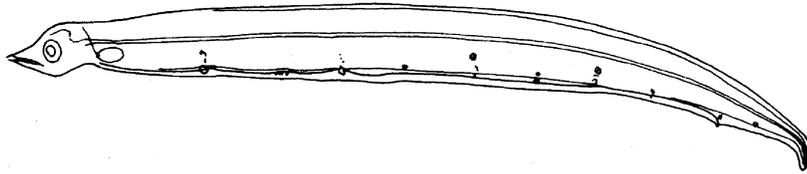
Note: 1. 2 species of *Acromycter* occur in the western North Atlantic. The leptocephali are similar except for different numbers of myomeres (159–162 in *Acromycter perturbator*; 167–171 in *Acromycter atlanticus*). The leptocephali of neither species have been collected in the study area, but they are included here because, unlike the larvae of other congrids, they have a strongly looped gut as in the leptocephali of the Ophichthidae (Smith and Leiby, 1980). Differences between *Acromycter* and ophichthid leptocephali are shown in the following table:

Character	<i>Acromycter</i> sp.	Ophichthidae
Nephros ends	about 50 myomeres anterior to anus	Within 15 myomeres of anus
Gut diameter	Esophagus and rest of gut about same diameter	Esophagus much slimmer than remainder of gut
Gut loop pigment	Positioned dorsal to nephros	Positioned dorsal to gut, below nephros
Postanal pigment spots	Large and superficial	Small and superficial or large and subcutaneous

Figures: Adult: Mary Fuges (Smith, 1989b); **A:** Smith and Leiby, 1980; **B:** Mary Fuges (Smith, 1989b)

References: Smith and Leiby, 1980; Smith, 1989b

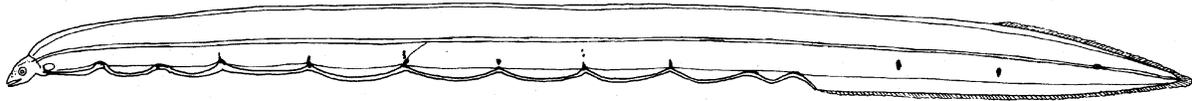
Acromycter sp.



A. 17 mmSL

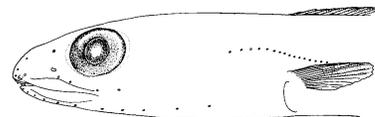
Predorsal myomeres 116-117

Total myomeres 159-162



B. 170 mmSL

Preanal myomeres 100-104

Ariosoma anale* (Poey, 1860)*Congridae****Longtrunk conger**

Range: North Atlantic Ocean in tropical waters; in the western North Atlantic from Florida Keys and Cuba; also northern coast of South America from Panama to the Guianas

Habitat: Collected from depths of 11–55 m; uncommon

Spawning: Undescribed. Leptocephali rarely collected in study area, May–Aug

Eggs: – Undescribed

Larvae:

- Body 11–17% SL, deeper than in 2 *Ariosoma* congeners
- Gut with relatively long section trailing outside body; long and straight, with slight swelling at end of esophagus
- Trailing section of gut up to 100% SL, or more (subject to breakage on collection); small specimens do not have trailing section developed
- Dorsal fin origin confined to posterior extremity of body, over anal fin origin
- Head and snout rather elongate, similar to that of *A. selenops*
- Midline and body pigment includes 3 series of short, diagonal dashes along the myosepta at the midline, upper limb of the myosepta, and just above lower angle of myosepta (see Fig. B)
- Some specimens also have oval shaped "thumbprint" of pigment midlaterally (at about myomere #50)
- Gut pigment as in *Ariosoma balearicum*, except row of pigment spots along underside of gut extends to anus
- Head pigment lacking
- Maximum leptocephalus size 187 mmSL

Meristic Characters

Myomeres: 147–155

Vertebrae: 146–150

Dorsal fin rays: –

Anal fin rays: –

Pectoral fin rays: 13–15

Pelvic fin rays: none

Note: 1. See 2 other species of *Ariosoma*, the leptocephali of which might occur in study area. Important differences between the 3 include myomere counts, nature of gut end (trailing or not) and body pigment.

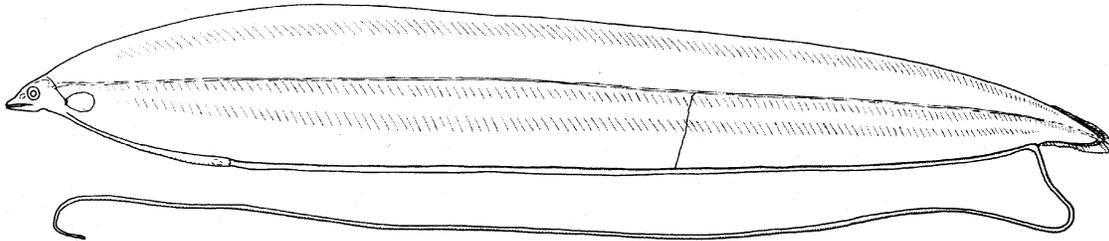
Figures: Adult (head): Smith and Kanazawa, 1977; **A–B:** Mary Fuges (Smith, 1989b)

References: Fahay, 1983; Smith, 1989b

Ariosoma anale

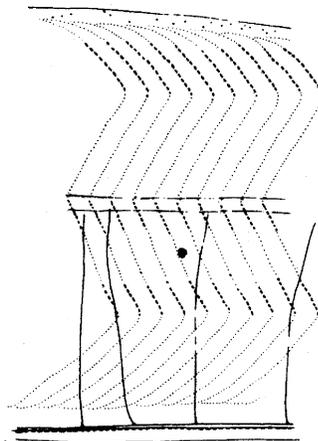
Predorsal myomeres 131-141

Total myomeres 147-155



A. 101 mmSL

Preanal myomeres 131-140
Last vertical blood vessel at myomere 90-103



Note 3 series of
myosepta pigment

**B. 101 mmSL
(Mid-body Detail)**

Ariosoma balearicum* (Delaroche, 1809)*Congridae****Bandtooth conger****Meristic Characters**

Myomeres:	120–137
Vertebrae:	120–136
Dorsal fin rays:	–
Anal fin rays:	–
Pectoral fin rays:	10
Pelvic fin rays:	none

Range: North Atlantic Ocean, Red Sea and Indian Ocean; in the western North Atlantic from North Carolina through the Gulf of Mexico and Caribbean Sea to Brazil; also eastern Atlantic from Mediterranean to Gulf of Guinea

Habitat: Sandy substrates and clear water in depths of 1–732 m, mostly <100 m; very common and widespread

Spawning: Summer-fall in the Gulf of Mexico; perhaps later in Sargasso Sea; leptocephali very commonly collected year-round in the northern Sargasso Sea and Gulf Stream, primarily Aug–Nov in the present study area (see Notes 3 and 4 below); larval duration estimated to be 7–8 months.

Eggs: – Undescribed

Larvae:

- Body elongate, deepest point slightly behind mid-length; tail moderately pointy
- Gut long, straight and narrow, without swellings; does not have trailing gut
- Dorsal fin origin confined to posterior extremity of body
- Head and snout relatively short
- Midline pigment includes a series of short diagonal dashes on every myoseptum from head to caudal area
- Gut pigment includes a series of spots along bottom of esophagus, shifting to top of gut after stomach-gall bladder to anus
- Head pigment lacking
- Series of small spots along dorsal edge for most of length
- Maximum leptocephalus size about 200 mmSL

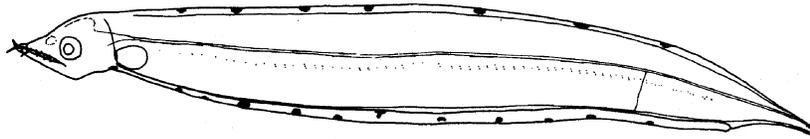
Note:

1. See 2 other species of *Ariosoma*, the leptocephali of which might occur in study area. Important differences between the 3 species include myomere counts, nature of gut end (trailing or not) and body pigment.
2. Experiments in the Sargasso Sea demonstrated that leptocephali are usually concentrated in the upper 100 m of the water column at night; not many collected during the day, suggesting net avoidance. (See Castonguay and M^cCleave, 1987).
3. Two groups of leptocephali, exhibiting overlapping ranges of myomeres, appear to be associated with separate spawning populations (Miller, 2002). In the present study area, leptocephali with the higher range (128–137) and lengths of 70–100 mm occur in the Sargasso Sea from Feb–Apr; those 20–80 mm occur in the northern Sargasso Sea and in the Gulf Stream from Sep–Oct. Leptocephali with lower counts of myomeres (120–130) are most abundant well south of the study area (in the Florida Current and Bahamas), but very large individuals rarely occur in northern and eastern Sargasso Sea (see Miller, 2002 for details).
4. High-count eels appear to engage in a spawning migration similar to that described for *Anguilla rostrata* and *Conger oceanicus*. Ripe adults occurring along the southeastern United States migrate (eastward) across the Florida Current and spawn in the northwest Sargasso Sea. Larvae resulting from this spawning use the entire Sargasso Sea as a "nursery" before crossing (westward) the Florida Current and recruiting to the adults' range.
5. See Miller (2002) for more details of larval distribution and for a description of contrasting patterns in low-count populations. Also refer to Ross *et al.*, (in press) for patterns of occurrences of these leptocephali in the Gulf Stream in the extreme southern part of the present study area, where low-count leptocephali dominate, presumably the result of spawning farther south (Florida Current, Bahamas, Gulf of Mexico or Caribbean Sea) (Miller, 1995).

Figures: Adult: Mary Fuges (Smith, 1989a); **A–B:** Mary Fuges (Smith, 1989b); **C–D:** Smith, 1979

References: Smith, 1989b; Miller and M^cCleave, 1994; Miller, 1995; 2002

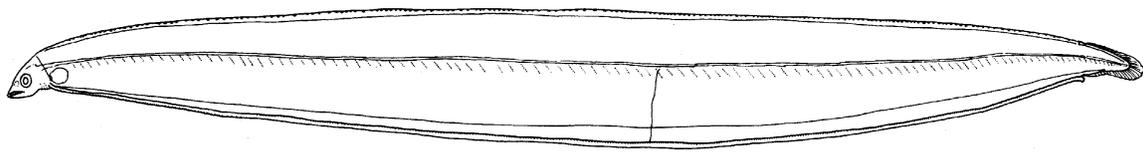
Ariosoma balearicum



A. 11 mmSL

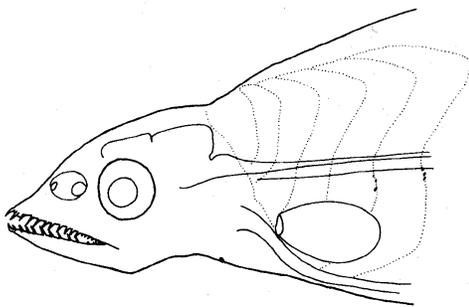
Predorsal myomeres 90-126

Total myomeres 121-136

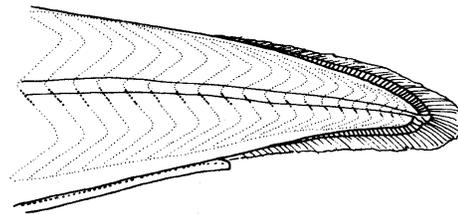


B. 94 mmSL

Preanal myomeres 90-126
Last vertical blood vessel at myomere 62-72



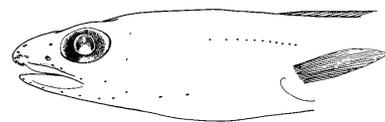
**C. 94 mmSL
(Head Detail)**



**D. 94 mmSL
(Caudal Area)**

Ariosoma selenops* Reid, 1934*Congridae**

No Common Name



Range: Western North Atlantic Ocean from the Bahamas and Cuba through the West Indies to the mouth of the Amazon River

Habitat: Collected from depths of 220–549 m

Spawning: Undescribed; leptocephali not uncommonly collected in study area, Jul–Nov

Eggs: – Undescribed

Larvae:

- Body shape similar to that of *A. balearicum*,
- Gut with relatively short section trailing outside body; long and straight, without swellings
- Trailing section of gut 3–17% SL
- Dorsal fin origin confined to posterior extremity of body, over anal fin origin
- Head and snout slightly more elongate and pointed than that of *A. balearicum*
- Midline pigment includes a series of short diagonal dashes on every myoseptum from head to caudal area
- Gut pigment includes row of small spots along bottom of gut from esophagus to anus (compare to leptocephali of *Ariosoma balearicum*)
- Head pigment lacking
- Maximum leptocephalus size 402 mmSL

Meristic Characters

Myomeres: 169–174

Vertebrae: 158–174

Dorsal fin rays: –

Anal fin rays: –

Pectoral fin rays: 13–16

Pelvic fin rays: none

Note: 1. See 2 other species of *Ariosoma*, the leptocephali of which might occur in study area. Important differences between the 3 include myomere counts, nature of gut end (trailing or not) and body pigment.

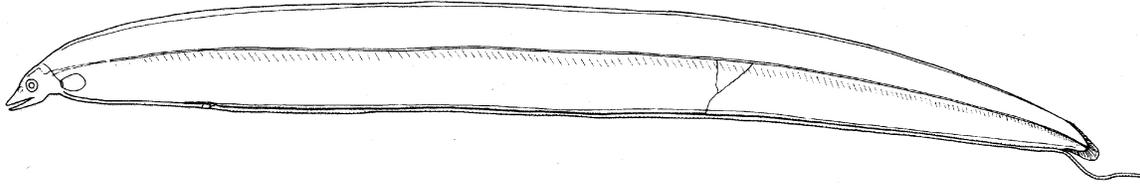
Figures: Adult: Smith, 1989a; **A–C:** Mary Fuges (Smith, 1989b)

References: Keller, 1976; Smith, 1989b

Ariosoma selenops

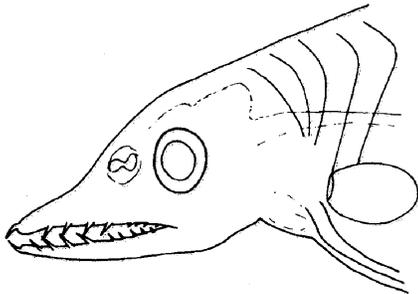
Predorsal myomeres 160-169

Total myomeres 169-174

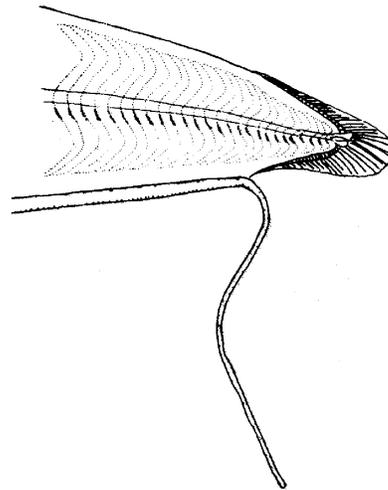


A. 76 mmSL

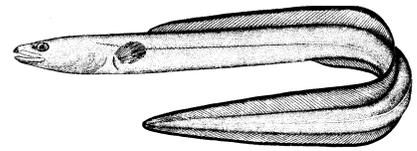
Preanal myomeres 160-169
Last vertical blood vessel at myomere 96-103



**B. 76 mmSL
(Head Detail)**



**C. 76 mmSL
(Caudal Area)**

Conger oceanicus* (Mitchill, 1818)*Congridae****Conger eel**

Range: Western North Atlantic Ocean along Atlantic coast of the United States (seldom north of Cape Cod) and eastern Gulf of Mexico; most common from Cape Cod to Delaware

Habitat: From nearshore to upper continental slope, as deep as 260 m (to a maximum of 577 m in Gulf of Mexico); occupy tilefish burrows off NE United States; presumably vacate coastal habitats and move offshore during winter

Spawning: Occurs in the SW Sargasso Sea during fall and winter; pattern of adult spawning migration, spawning, and leptocephali passively drifting and returning to coastal nursery habitats similar to that of *Anguilla rostrata*

Eggs: – Undescribed; those described by Eigenmann (1902) as *C. oceanicus* have been shown to be eggs of the ophichthid eel *Ophichthus cruentifer* (Naplin and Obenchain, 1980)

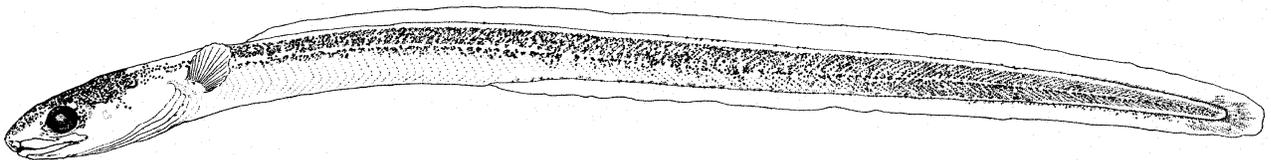
Larvae: – Body moderately elongate; deepest just behind mid-point
 – Gut long, straight and simple, without swellings
 – Dorsal fin origin about 66% of length
 – Head and snout moderately short
 – Midline pigment variable: large individuals (>64 mm) usually have a series of melanophores along mid-line
 – Gut pigment includes a paired series of small spots along top of gut from head to anus
 – Head pigment includes a crescentic patch below eye
 – Caudal fin rays have scattering of small spots at their base
 – Maximum leptocephalus size about 100 mmSL

Note: 1. Experiments in the Sargasso Sea demonstrate that leptocephali are usually concentrated in upper 100 m of water column at night; not many collected during the day, suggesting net avoidance. (See Castonguay and M^cCleave, 1987).

Early Juvenile: Transforming juveniles enter estuarine inlets in large numbers between May and Jul, suggesting that the larval duration is about 6–8 months long. Leptocephali (*per se*) have never been collected north of Cape Hatteras, although transforming individuals have been, including large numbers in bottom-tending nets on the continental shelf near inlets. Transformation from leptocephalus to glass eel may take place south of the study area, late leptocephali may occupy deep near-bottom layers on the Middle Atlantic Bight continental shelf, or they may simply be adept at avoiding capture with plankton nets. See discussion in Able and Fahay (1998) and Bell *et al.* (2003).

Meristic Characters

Myomeres:	140–148
Vertebrae:	143–147
Dorsal fin rays:	–
Anal fin rays:	–
Pectoral fin rays:	16–18
Pelvic fin rays:	none

**G. 62.0 mmTL (Elver)**

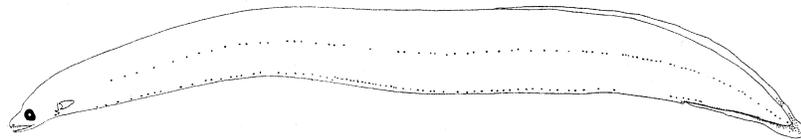
Figures: Adult: H.L. Todd; A–F: Nancy Arthur (Bell *et al.*, 2003); G: Susan Kaiser (Able and Fahay, 1998)

References: Hood *et al.*, 1988; M^cCleave and Miller, 1994; Able and Fahay, 1998; Smith, 1989b

Conger oceanicus

Predorsal myomeres 67-81

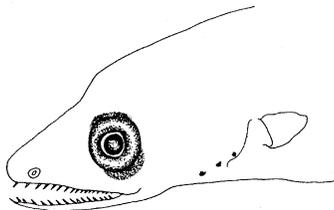
Total myomeres 140-148



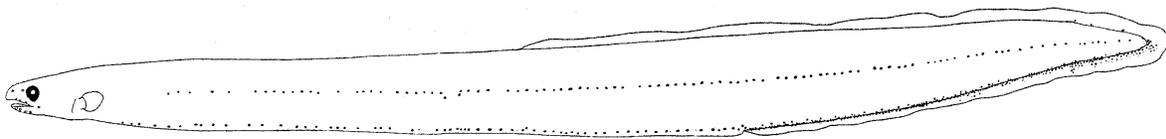
A. 85.4 mmTL

Preanal myomeres 113-124

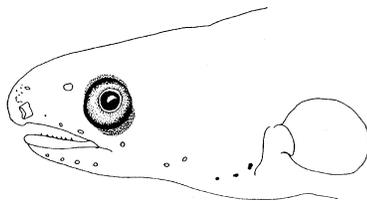
Last vertical blood vessel at myomere 51-55



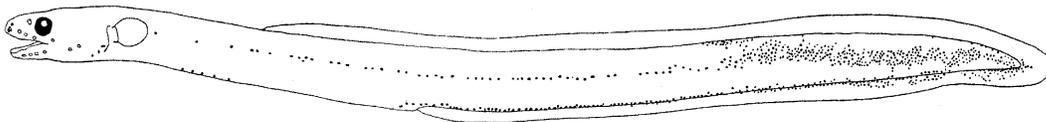
B. 85.4 mmTL (Head Detail)



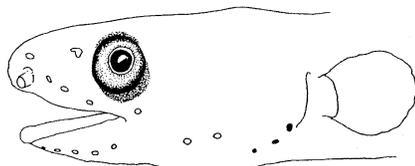
C. 114.0 mmTL



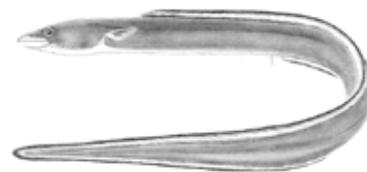
D. 114.0 mmTL (Head Detail)



E. 82.8 mmTL



F. 82.8 mmTL (Head Detail)

Conger triporiceps* Kanazawa, 1958*Congridae****Manytooth conger**

Range: Western North Atlantic Ocean from Bermuda, the Bahamas and southern Florida through the West Indies and western Caribbean Sea to Brazil

Habitat: Sandy bottoms around coral reefs in clear water at depths of 4–15 m

Spawning: Occurs in the SW Sargasso Sea during fall and winter; also occurs in western Caribbean Sea; after dispersal from spawning area, most larvae drift into Caribbean and Gulf of Mexico, but some larvae drift west and north (in Florida Current and Gulf Stream) and may be found in study area. Historical accounts of *C. conger* leptocephali off the United States coast may be based partially on this species; myomere counts of the two species overlap broadly.

Eggs: – Undescribed

Larvae:

- Body shape similar to that of *Conger oceanicus* leptocephali
- Gut long, straight and simple, without swellings
- Dorsal fin origin >50% of length
- Head and snout moderately short
- Midline pigment absent
- Gut pigment includes a paired series of small spots along top of gut from head to anus
- Head pigment includes a crescentic patch below eye
- Caudal fin rays have scattering of small spots at their base
- Leptocephali are identical to those of *C. oceanicus*, except midline pigment absent
- Maximum leptocephalus size 110 mmSL; transforming specimens 88–105 mmSL

Early Juvenile: After spawning (not before Nov), leptocephali in the Gulf of Mexico grow to about 53 mmSL by Feb; by Apr, average size has increased to about 85 mmSL; transformation occurs in the next 2 months. Therefore, larval duration is estimated to occupy about 5–6 months. See discussion in Smith (1989b).

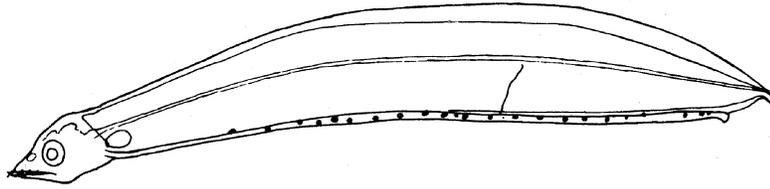
Meristic Characters

Myomeres:	150–158
Vertebrae:	156–160
Dorsal fin rays:	–
Anal fin rays:	–
Pectoral fin rays:	14–17
Pelvic fin rays:	none

Figures: Adult: Steven Gigliotti (Smith, 1989b); **A–B:** Mary Fuges (Smith, 1989b); **C–D:** Smith, 1979

References: McCleave and Miller, 1994; Smith, 1989b

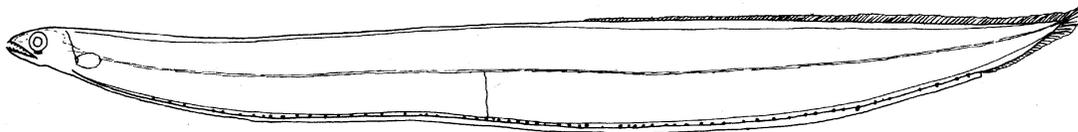
Conger triporiceps



A. 17 mmSL

Predorsal myomeres 65-78

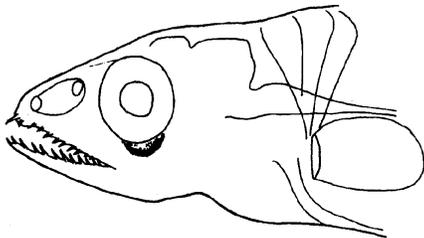
Total myomeres 150-158



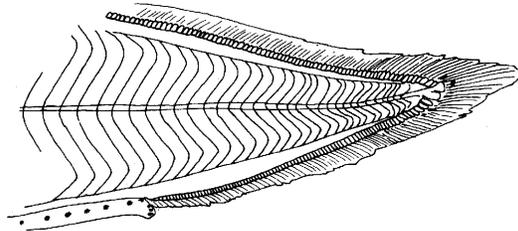
B. 85 mmSL

Preanal myomeres 124-133

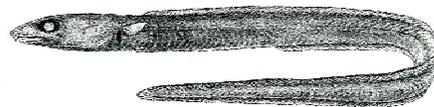
Last vertical blood vessel at myomere 54-70



**C. 85 mmSL
(Head Detail)**



**D. 85 mmSL
(Caudal Area)**

Gnathophis bathytopos* Smith and Kanazawa, 1977*Congridae****Blackgut conger**

Range: Western North Atlantic Ocean along east coast of North America from latitude of Chesapeake Bay to Florida; also Gulf of Mexico and Yucatan Channel; 2 congeners have similar ranges, but do not extend as far north (see table below)

Habitat: Found in depths of 90–366 m

Spawning: Undescribed; leptocephali not uncommonly collected in study area May–Nov

Eggs: – Undescribed

Larvae:

- Body moderately elongate, deepest at about mid-length
- Gut long, straight and simple, without swellings; postanus length <10% SL
- Dorsal fin origin at about 75% of SL
- Head and snout rather elongate and conical in shape
- Midline pigment usually absent; some specimens have irregular series of small melanophores just below midline, mostly on posterior half of body; irregular occurrence of midline pigment not related to size
- Gut pigment includes a paired series of small spots along top of gut from head to anus
- Head pigment includes a crescentic patch below eye
- Small spots sometimes on bases of caudal and anal fins
- Maximum leptocephalus size 124 mmSL

Note: 1. Myomere counts of 2 congeners in the western North Atlantic overlap broadly, the 3rd species is very rare, and leptocephali in this genus can not be identified to the species level with certainty, based on present information. Of the 3, only *G. bathytopos* occurs north of 35°N as adults:

Species	Total Vertebrae
<i>Gnathophis bathytopos</i>	128–133
<i>Gnathophis bracheatopos</i>	125–130
<i>Gnathophis tritos</i>	136–138

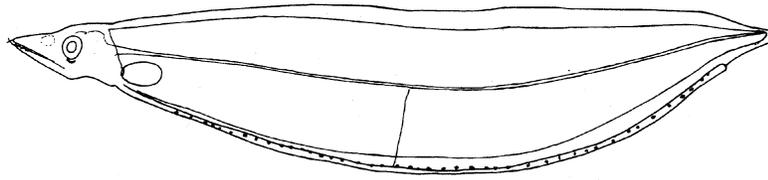
Gnathophis tritos**Meristic Characters**

Myomeres:	126–141
Vertebrae:	128–133
Dorsal fin rays:	186–215
Anal fin rays:	124–159
Pectoral fin rays:	10–13
Pelvic fin rays:	none

Figures: Adult (*G. tritos*): Mary Fuges (Smith, 1989a); **A–B, D:** Mary Fuges (Smith, 1989b); **C:** Smith, 1979

References: Smith, 1989a; 1989b

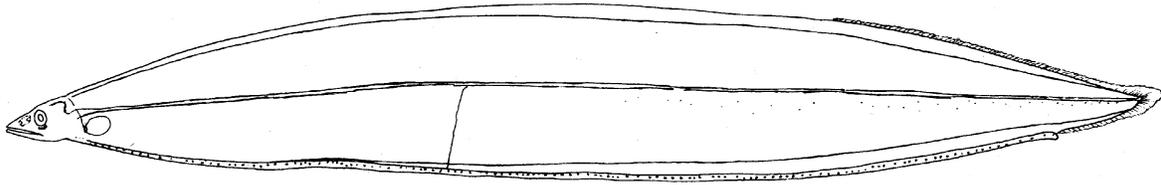
Gnathophis sp.



A. 18 mmSL

Predorsal myomeres 72-102

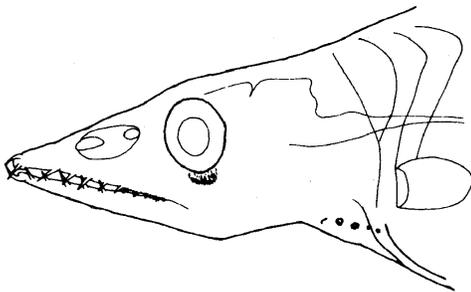
Total myomeres 126-141



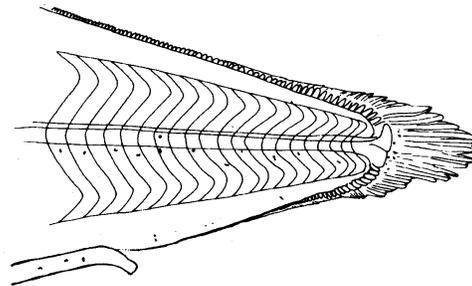
B. 64 mmSL

Preanal myomeres 101-125

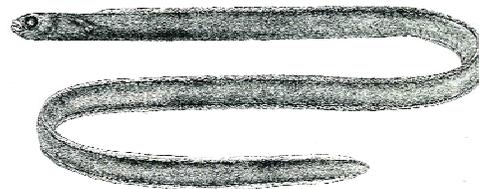
Last vertical blood vessel at myomere 43-47



**C. 64 mmSL
(Head Detail)**



**D. 64 mmSL
(Caudal Area)**

Heteroconger halis* (Böhlke, 1957)*Congridae****Brown garden eel**

Range: Western North Atlantic Ocean from Florida, the Bahamas and Caribbean Sea (replaced in Gulf of Mexico by *H. luteolus*)

Habitat: Burrows in sandy bottoms in clear, relatively shallow water, at depths of 10–50 m, usually in slight to moderate bottom currents; colonial

Spawning: Behavior undescribed, but leptocephali are pelagic; larvae of both *Heteroconger halis* and *H. luteolus* have been collected in study area (Aug). Spawning probably restricted to summer and fall, and larval period is probably relatively short (e.g. about 4 months)

Eggs: – Undescribed

Larvae:

- Body moderate, tip of tail moderately blunt and rounded
- Gut simple and relatively short, preanal length about 66–75% SL
- Liver forms a fairly prominent bulge near anterior gut, esophagus thinner than intestine
- Dorsal fin origin begins at about 25% of length
- Midline pigment consists of melanophores on every 2 or 3 myosepta from head to tail tip
- A series of melanophores on gut, from head to anus, followed by a series above the anal fin base
- Few small melanophores on bases of caudal and posterior dorsal and anal fins
- Maximum leptocephalus size about 75 mmSL

Meristic Characters

Myomeres:	159–167
Vertebrae:	158–168
Dorsal fin rays:	469 (n = 1)
Anal fin rays:	311 (n = 1)
Pectoral fin rays:	11–12
Pelvic fin rays:	none

Figures: Adult: Mary Fuges (Smith, 1989a); A–C: Mary Fuges (Smith, 1989b)

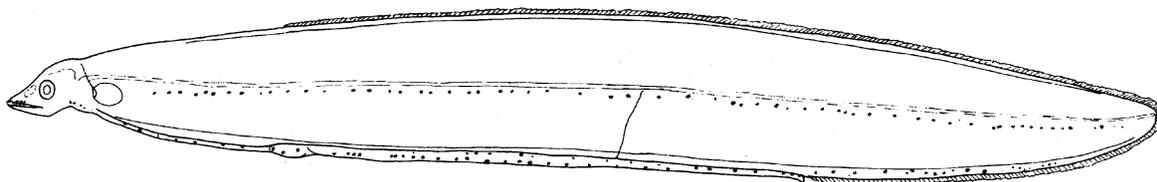
References: Keller, 1976; Smith, 1989a; 1989b

Heteroconger halis* and *H. luteolus

Leptocephali of *Heteroconger luteolus* (below) and *H. halis* are essentially identical except for numbers of total and preanal myomeres. The description opposite will serve for both species except for myomere characters. *Heteroconger luteolus* is restricted to the Gulf of Mexico, where it replaces *H. halis*.

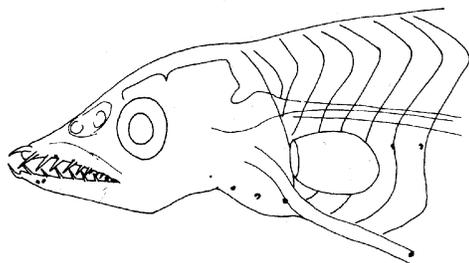
Predorsal myomeres 21-30

Total myomeres 137-148

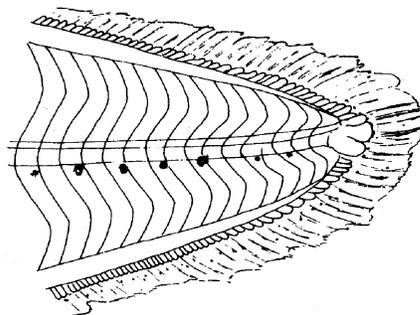


A. 40 mmSL

Preanal myomeres 79-87
Last vertical blood vessel at myomere 62-68



**B. 40 mmSL
(Head Detail)**



**C. 40 mmSL
(Caudal Area)**

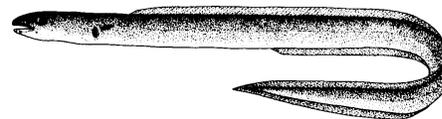
Leptocephali of *Heteroconger halis* (not illustrated) are similar to those of *H. luteolus* but they have more total and preanal myomeres, similar numbers of predorsal myomeres, and a similar position of the last vertical blood vessel:

Heteroconger halis:

Total myomeres:	159-167
Preanal myomeres:	82-94
Predorsal myomeres:	20-30
Last vertical blood vessel at myomere:	63-69

Pseudophichthys splendens* (Lea, 1913)*Congridae**

No common name



Range: Western North Atlantic Ocean from east coast of Florida through Caribbean Sea to the Guianas, including Gulf of Mexico; also eastern Atlantic Ocean in tropical waters

Habitat: Flat bottoms in depths of 37–1,647 m; commonly taken in trawls

Spawning: Throughout the year; leptocephali infrequently collected in study area, Aug–Sep

Eggs: – Undescribed

Larvae:

- Body moderate, deepest point just behind mid-length; tail moderately sharp
- Gut long and simple, without swellings; anus at about 75% SL
- Dorsal fin short; origin slightly posterior to level of anus
- Head and snout moderate in length
- Pigment scattered over lateral surface of body; melanophores occur above, on, and below midline
- 4 conspicuous clusters of pigment occur just below midline, stretched out vertically along myosepta
- Usually a single, conspicuous melanophore just above midline between anus and caudal end
- Gut pigment features large spots irregularly arranged dorsal, lateral and ventral to gut tube
- No head pigment except spots lateral to heart region
- Unique pigment pattern is retained by juveniles
- Maximum leptocephalus size 120 mmSL or larger

Note: 1. Observations north of Bermuda indicate this leptocephalus occurs in deeper layers than leptocephali of most other species (Keller, 1976)

Meristic Characters

Myomeres:	131–137
Vertebrae:	130–136
Dorsal fin rays:	–
Anal fin rays:	–
Pectoral fin rays:	10–13
Pelvic fin rays:	none

Figures: Adult: Mary Fuges (Smith, 1989a); **A:** Mary Fuges (Smith, 1989b); **B–D:** Smith, 1979

References: Keller, 1976; Smith, 1989a; 1989b

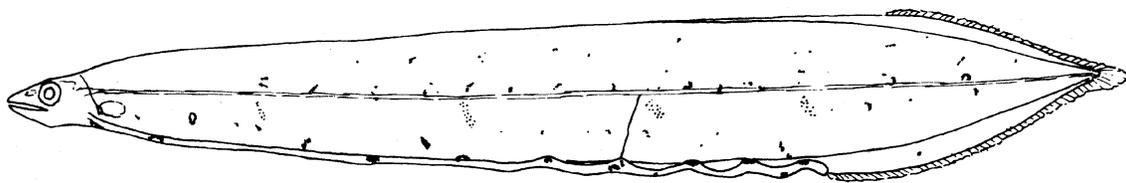
Pseudophichthys splendens



A. 19 mmSL

Predorsal myomeres 83-85

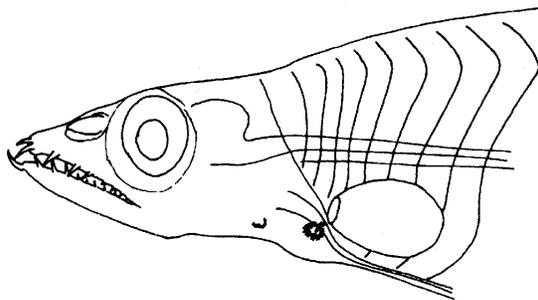
Total myomeres 131-137



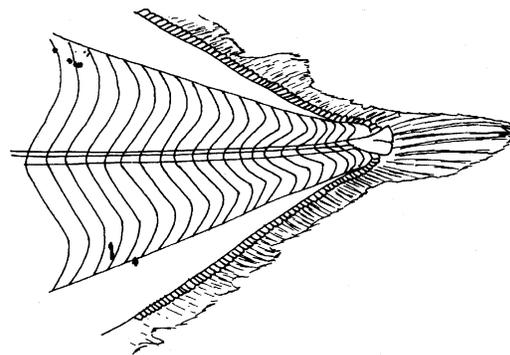
B. 50 mmSL

Preanal myomeres 79-84

Last vertical blood vessel at myomere 56-59



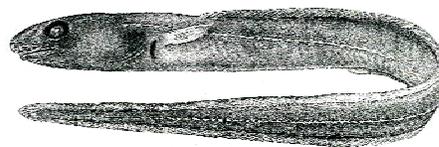
**C. 50 mmSL
(Head Detail)**



**D. 50 mmSL
(Caudal Area)**

Rhechias dubia* (Breder, 1927)*Congridae**

No common name



Range: Western North Atlantic Ocean from coast of Georgia, Florida and Gulf of Mexico, through the Caribbean Sea to the Guianas

Habitat: Found in depths of 128–886 m

Spawning: Fall-winter or longer; a single leptocephalus collected in study area in Apr at 38°31.2'N, 72°23.6'W (MCZ 85071); leptocephali identified to *Rhechias* sp. more commonly collected, Apr–Jun and Sep–Oct

Eggs: – Undescribed

Larvae:

- Body moderate in shape; deepest point about at mid-length
- Gut long and simple, without swellings
- Dorsal fin origin slightly behind mid-length
- Head and snout moderately short
- Midline pigment includes row of large spots spaced at intervals of 1–3 myosepta
- Gut pigment includes a paired row of small spots along side of gut from just behind head to anus; larger larvae have a 2nd row of spots above the major row, on posterior 2/3 of gut
- Head pigment includes a crescentic patch below the eye; few spots on upper jaw
- Small melanophores on bases of caudal and anal fins
- Maximum leptocephalus size unknown; largest collected 54 mmSL, not near transformation

Note: 1. A single adult specimen of *Bathyuroconger vicinus* has been collected off Block Island, Rhode Island (Moore *et al.*, 2003). Other specimens are only known from Gulf of Mexico, Caribbean Sea and northern coast of South America to the Guianas. Its leptocephalus has only been identified tentatively, (and not reported from north of 35°N), but might resemble those of *Rhechias* sp. These tentatively identified leptocephali have 176–187 total myomeres and the last vertical blood vessel is positioned at myomere 59–64

Meristic Characters

Myomeres:	127–144
Vertebrae:	120–145
Dorsal fin rays:	–
Anal fin rays:	–
Pectoral fin rays:	11–14
Pelvic fin rays:	none

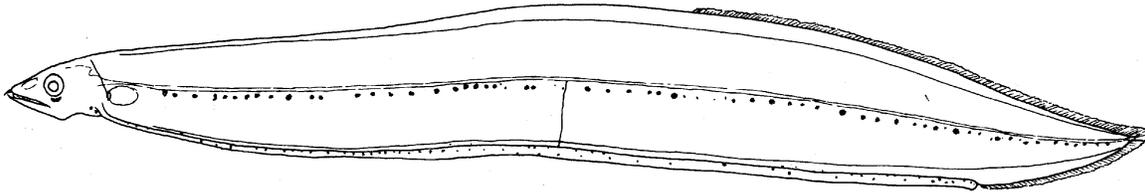
Figures: Adult: Mary Fuges (Smith, 1989a); A: Mary Fuges (Smith, 1989b)

References: Smith, 1989b

Rhechias dubia

Predorsal myomeres 51-60

Total myomeres 127-144



A. 54 mmSL

Preanal myomeres 85-103

Last vertical blood vessel at myomere 44-53

Rhynchoconger flavus* (Goode and Bean, 1896)*Congridae****Yellow conger**

Range: Western North Atlantic Ocean from the Gulf of Mexico through Caribbean Sea and along northern coast of South America to Amazon River mouth; very abundant

Habitat: Usually on silt or mud bottoms at depths of 26–183 m

Spawning: Variable within range: in southern Gulf of Mexico fall, winter and spring; in northern Gulf of Mexico summer and fall; leptocephali not uncommonly collected in study area Apr–Jun and Sep–Oct

Eggs: – Undescribed

Larvae:

- Body moderately elongate, deepest just behind mid-point; tail pointed
- Gut long and simple, without swellings; postanal length about 10% SL
- Dorsal fin origin near mid-length of body
- Head and snout moderately short; upper profile convex in larger leptocephali
- Midline pigment includes an uneven row of fairly large subcutaneous melanophores spaced at intervals of every 2–5 myosepta
- Gut pigment includes a paired row of small spots on side of gut from head to anus
- No head pigment; crescentic pigment under eye absent
- Very small spots on caudal and anal fin rays
- Maximum leptocephalus size 117 mmSL

Note: 1. Leptocephali of a congener, *R. gracilior*, are similar, but have midline row of pigment arranged in a more even line, and have more myomeres; a trace of pigment is also sometimes present below the eye.

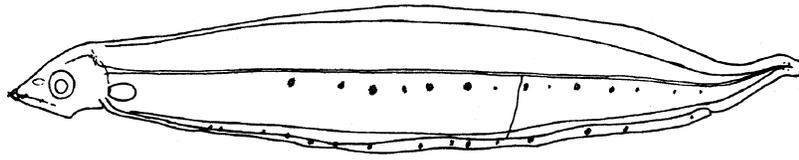
Meristic Characters

Myomeres:	153–170
Vertebrae:	159–172
Dorsal fin rays:	–
Anal fin rays:	–
Pectoral fin rays:	12
Pelvic fin rays:	none

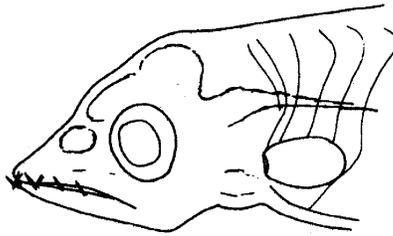
Figures: Adult: Mary Fuges (Smith, 1989a); **A-C:** Mary Fuges (Smith, 1989b); **D-E:** Smith, 1979

References: Lea, 1913; Smith, 1989b

Rhynchoconger flavus



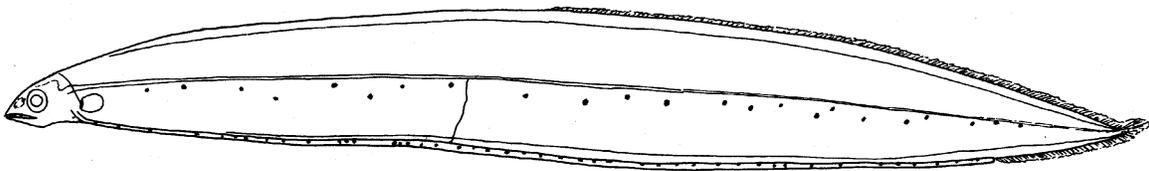
A. 15 mmSL



**B. 15 mmSL
(Head Detail)**

Predorsal myomeres 49-62

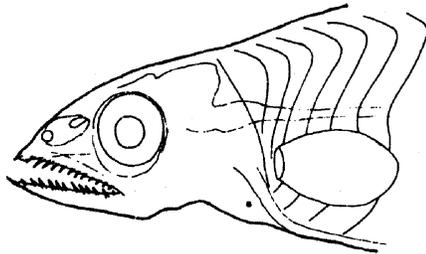
Total myomeres 153-170



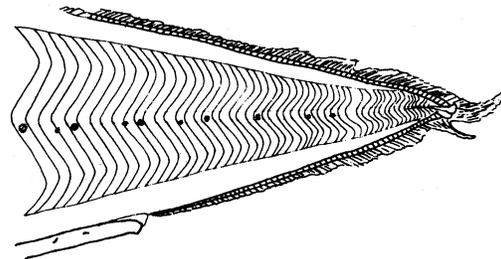
C. 73 mmSL

Preanal myomeres 102-132

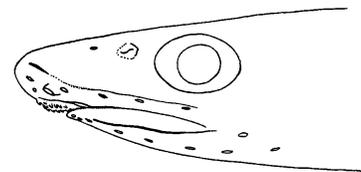
Last vertical blood vessel at myomere 44-51



**D. 73 mmSL
(Head Detail)**



**E. 73 mmSL
(Caudal Area)**

Rhynchoconger gracilior* (Ginsburg, 1951)*Congridae****Whiptail conger**

Range: Western North Atlantic Ocean from east coast of Florida and eastern Gulf of Mexico, through Caribbean Sea to Suriname; rarely as far north as continental slope off New England

Habitat: Clear water areas in depths of 82–458 m

Spawning: Probably protracted; leptocephali collected in study area Aug–Nov (1 in Apr); not as commonly collected as *Rhynchoconger flavus*

Eggs: – Undescribed

Larvae:

- Body moderately elongate, deepest just behind mid-point; tail pointed
- Gut long and simple, without swellings; postanal length about 10% SL
- Dorsal fin origin near mid-length of body
- Head and snout moderately short; upper profile convex in larger leptocephali
- Midline pigment includes an evenly arranged row of fairly large subcutaneous melanophores spaced at intervals of every 3–4 myosepta
- Gut pigment includes a paired row of small spots on side of gut from head to anus, somewhat more widely spaced than same pigment in *R. flavus*
- Head pigment includes a trace of a crescent pattern below eye, and small spots on palate and lower jaw in small specimens
- Very small spots on caudal and anal fin rays
- Maximum leptocephalus size 109 mmSL

Meristic Characters

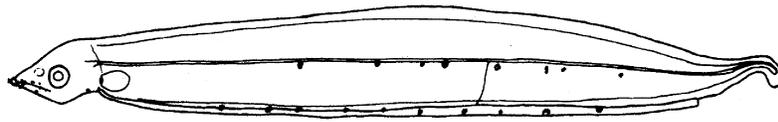
Myomeres:	172–182
Vertebrae:	175–182
Dorsal fin rays:	–
Anal fin rays:	–
Pectoral fin rays:	9–13
Pelvic fin rays:	none

Note: 1. Leptocephali of a congener, *R. flavus*, are similar, but have midline row of pigment arranged in an uneven line, and have fewer myomeres. Pigment is absent below the eye, on jaws and on palate.

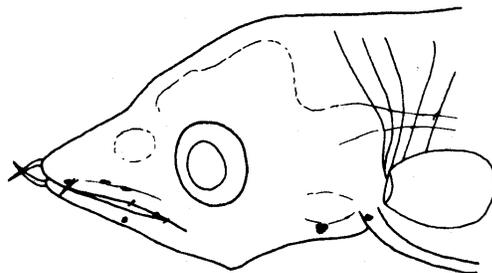
Figures: Adult (Head): Smith, 1989a; **A-C:** Mary Fuges (Smith, 1989b)

References: Smith, 1989b; Moore *et al.*

Rhynchoconger gracilior



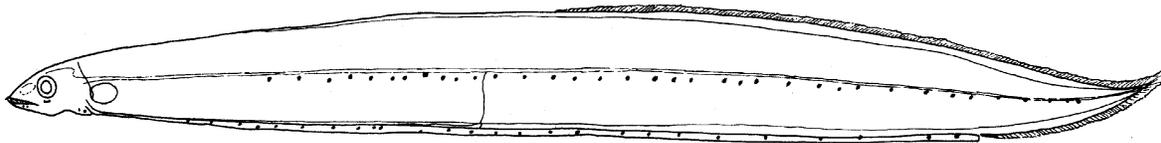
A. 16 mmSL



**B. 16 mmSL
(Head Detail)**

Predorsal myomeres 48-59

Total myomeres 172-182



C. 65 mmSL

Preanal myomeres 102-130

Last vertical blood vessel at myomere 43-49

Uroconger syringinus* Ginsburg, 1954*Congridae**

No common name



- Range:** Western North Atlantic Ocean from east coast of Florida and western Bahamas, through the Gulf of Mexico and coasts of Central and South America to Suriname; rare in the West Indies
- Habitat:** Mostly continental species, usually not found off islands; found in depths of 44–384 m
- Spawning:** Throughout the year in Gulf of Mexico; leptocephali infrequently collected in study area, Jun–Sep
- Eggs:** – Undescribed
- Larvae:**
- Body elongate, tail sharp
 - Gut long and simple, without swellings; postanal length <10% SL
 - Dorsal fin origin at mid-length or slightly anterior to mid-length
 - Head and snout rather short
 - Midline pigment includes a row of moderately large melanophores spaced at intervals of 1 or 2 myosepta
 - Gut pigment includes a paired series of spots on top of gut from behind head to anus; this row continues posterior to anus as an irregular single (or double) row of smaller spots to caudal fin
 - Head pigment includes a crescentic patch below the eye
 - Maximum leptocephalus size 134 mmSL

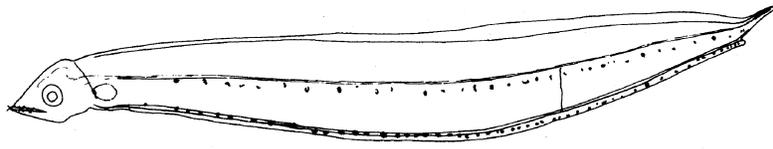
Meristic Characters

Myomeres:	216–227
Vertebrae:	220–225
Dorsal fin rays:	–
Anal fin rays:	–
Pectoral fin rays:	11–12
Pelvic fin rays:	none

Figures: Adult: Mary Fuges (Smith, 1989a); **A–B:** Mary Fuges (Smith, 1989b); **C–D:** Smith, 1979

References: Smith, 1989a; 1989b

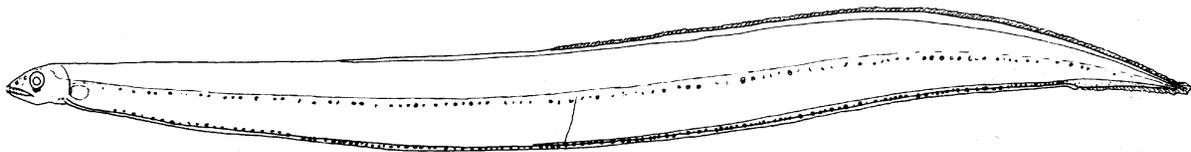
Uroconger syringinus



A. 20 mmSL

Predorsal myomeres 64-77

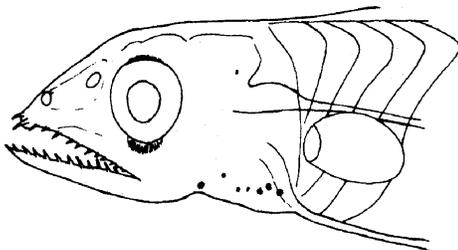
Total myomeres 216-227



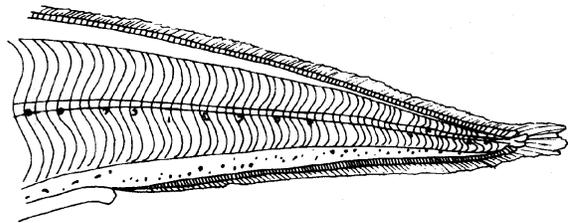
B. 93 mmSL

Preanal myomeres 154-175

Last vertical blood vessel at myomere 65-75



**C. 93 mmSL
(Head Detail)**



**D. 93 mmSL
(Caudal Area)**

Xenomystax congroides* Smith and Kanazawa, 1989*Congridae**

No common name



Range: Western North Atlantic Ocean from Gulf of Mexico, the Bahamas, West Indies from Cuba to Leeward Islands, and coasts of Central and South America to mouth of Amazon River; also eastern Atlantic Ocean in Gulf of Guinea

Habitat: Collected from depths of 140–825 m

Spawning: Extended, probably fall through winter; a single leptocephalus has been collected in study area, off coast of New Jersey (39°48'N, 70°22'W) in Jun (Fahay, 1976)

Eggs: – Undescribed

Larvae:

- Body deepens abruptly behind head, remains deep, then tapers to tail
- Gut long, straight and simple, without swelling
- Dorsal fin origin well posterior, but anterior to level of anus
- Head and snout moderate; dorsal profile rounded in larger individuals
- Midline pigment features several large, expanded melanophores, just below midline, distributed irregularly on either side of body
- Gut pigment includes a few fairly large spots on anterior part of gut
- Head pigment restricted to few spots behind brain and on rostrum
- Maximum leptocephalus size 350 mmSL; transforming specimens 183–235 mmSL

Note:

1. Myomere counts differ between populations: 189–196 from Gulf of Mexico; 200–212 from Caribbean; and 213–219 from the Gulf of Guinea (eastern Atlantic). There are also minor pigment differences between leptocephali from these populations (Smith, 1989b)
2. Leptocephalus in Fig. B has 207 total myomeres; 99 predorsal myomeres; 133 preanal myomeres and the last vertical blood vessel is located at myomere 56.

Meristic Characters

Myomeres:	189–221
Vertebrae:	189–219
Dorsal fin rays:	–
Anal fin rays:	–
Pectoral fin rays:	10–15
Pelvic fin rays:	none

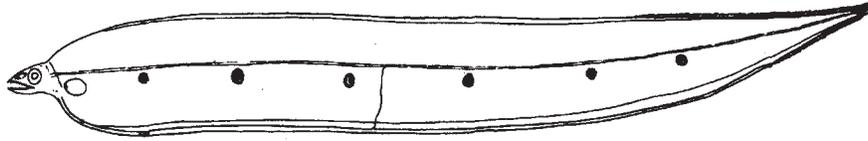
Figures: Adult: Mary Fuges (Smith, 1989a); **A:** Mary Fuges (Smith, 1989b); **B:** Fahay (1976); **C–D:** Smith, 1979

References: Fahay, 1976; Smith, 1989b

Xenomystax congroides

Predorsal myomeres 99-101

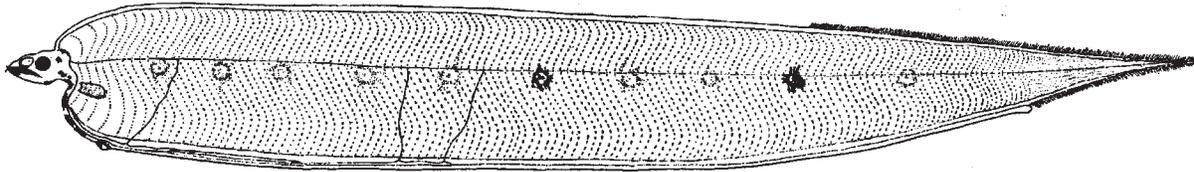
Total myomeres 189-221



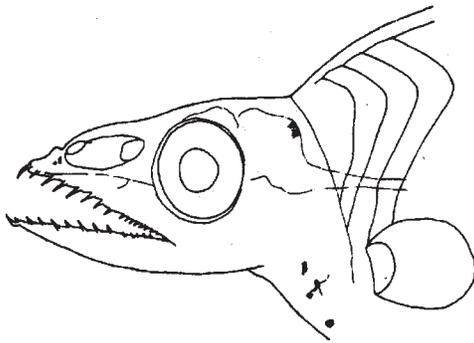
A. 113 mmSL

Preanal myomeres 120-148

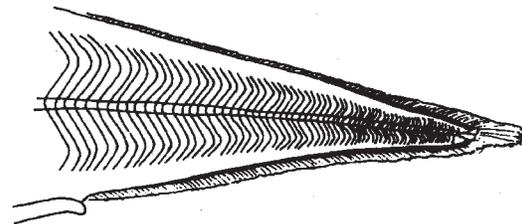
Last vertical blood vessel at myomere 52-67



B. 202.5 mmSL



**C. 113 mmSL
(Head Detail)**



**D. 113 mmSL
(Caudal Area)**

Derichthys serpentinus* Gill, 1884*Derichthyidae****Narrowneck eel**

Range: Indo-West Pacific Ocean and Western North Atlantic Ocean from Bermuda and the Bahamas to Sargasso Sea; absent from Gulf of Mexico and Caribbean Sea

Habitat: No information

Spawning: Undescribed; possibly winter, spring and summer; frequently collected in study area, Jul–Oct

Eggs: – Undescribed

Larvae:

- Body moderately deep (deeper than *Nessorhamphus ingolfianus*) with fairly sharp tail
- Gut long, simple, without swellings; length about 75% SL
- Dorsal fin origin near mid-length
- Head and snout relatively short; dorsal profile slightly concave
- Midline pigment characterized by a few, scattered melanophores posterior to level of last vertical blood vessel
- Gut pigment lacking
- Head pigment lacking
- Maximum leptocephalus size 50–60 mmSL

Note: 1. Experiments in the Sargasso Sea demonstrate that larvae occur in depths between 125 and 150 m during the day, 30 and 70 m at night. See Castonguay and M^cCleave (1987).

Meristic Characters

Myomeres:	125–135
Vertebrae:	128–134
Dorsal fin rays:	239–243
Anal fin rays:	157–166
Pectoral fin rays:	13
Pelvic fin rays:	none
Caudal fin rays:	9–10

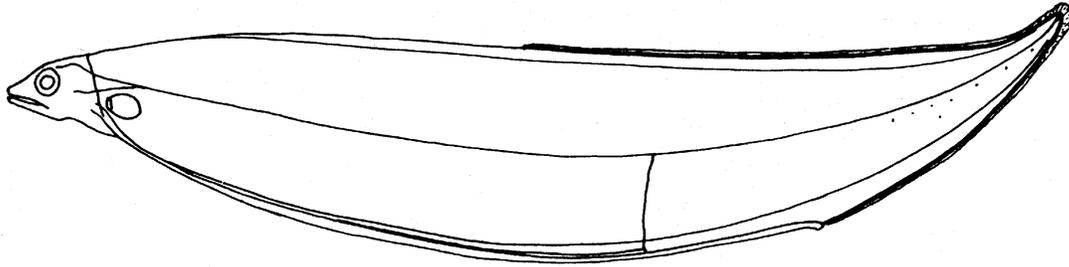
Figures: Adult: H.L. Todd (Goode and Bean, 1896); A–C: Smith, 1979

References: Castle, 1970b; C. Robins, 1989; Smith, 1989b

Derichthys serpentinus

Predorsal myomeres 45-50

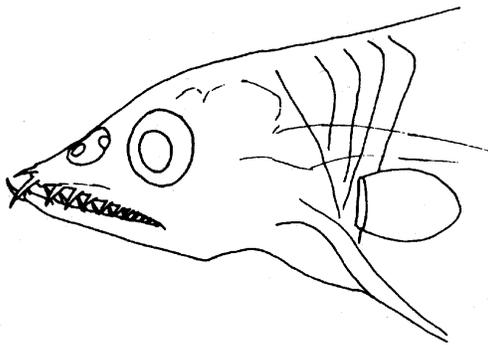
Total myomeres 125-135



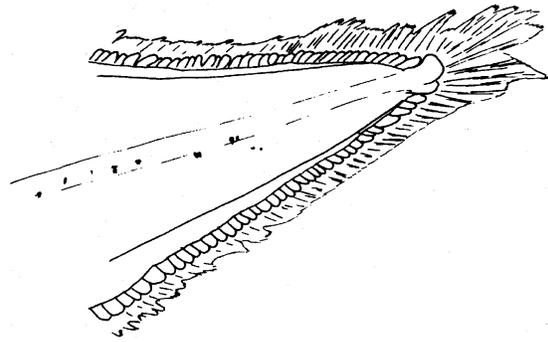
A. 42 mmSL

Preanal myomeres 67-83

Last vertical blood vessel at myomere 59-61



**B. 42 mmSL
(Head Detail)**



**C. 42 mmSL
(Caudal Area)**

Nessorhamphus ingolfianus* (Schmidt, 1912)*Derichthyidae****Spoonbill eel**

Range: North and South Atlantic, Indian and central Pacific oceans; absent from Caribbean Sea, but discrete population in western Gulf of Mexico

Habitat: No information

Spawning: Occurs spring and summer; leptocephali frequently collected in study area, Jul–Oct

Larvae:

- Body moderately deep (shallower than that of *Derichthys serpentinus*), deepest point behind mid-length
- Tail fairly sharp, frequently upturned at tip
- Gut long, simple, without swellings; postanal length about 10% SL
- Dorsal fin origin slightly in advance of mid-length
- Head and snout moderately elongate; dorsal profile flat or very slightly concave
- Midline pigment includes only a very few melanophores at posterior end of body
- Gut pigment lacking
- Head pigment limited to few spots over eye
- Maximum leptocephalus size 80–90 mmSL

Meristic Characters

Myomeres:	149–160
Vertebrae:	147–159
Dorsal fin rays:	–
Anal fin rays:	–
Pectoral fin rays:	12–13
Pelvic fin rays:	none
Caudal fin rays:	10–12

Note: 1. Experiments in the Sargasso Sea demonstrate that leptocephali are usually concentrated in upper 100 m of water column at night; not many collected during the day, suggesting net avoidance. (See Castonguay and McCleave, 1987)

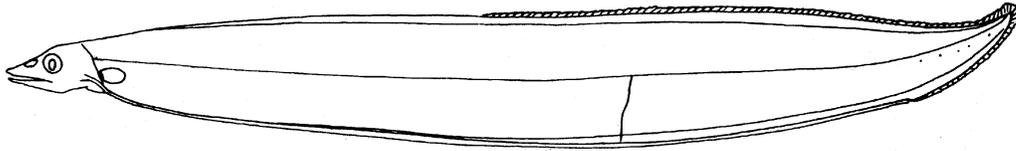
Figures: Adult: Mary Fuges (Robins, 1989); A–C: Smith, 1979

References: Keller, 1976; Castonguay and McCleave, 1987; Smith, 1989b

Nessorhamphus ingolfianus

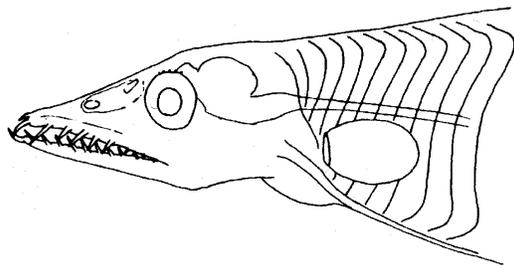
Predorsal myomeres 62

Total myomeres 149-160

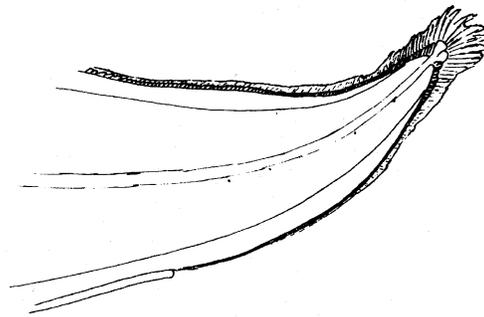


A. 48 mmSL

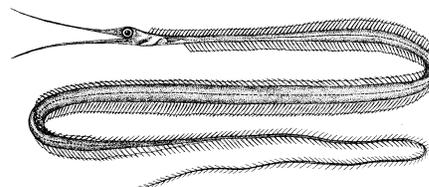
Preanal myomeres 117-121
Last vertical blood vessel at myomere 77



**B. 48 mmSL
(Head Detail)**



**C. 48 mmSL
(Caudal Area)**

Nemichthys scolopaceus* Richardson, 1848*Nemichthyidae****Slender snipe eel**

Range: Widespread in the North Atlantic Ocean as far north as 55°N, including Gulf of Mexico, Caribbean Sea; also eastern South Atlantic Ocean, Indian Ocean and much of the Pacific Ocean

Habitat: Mesopelagic, mostly in the upper 1,000 m of the water column; very common

Spawning: Uncertain; prolonged seasonal pattern, with a possible peak in spring; leptocephali commonly collected in study area, usually summer-fall

Eggs: – Undescribed

Larvae:

- Body long and slender; body depth 4–11% SL; tail very attenuate
- Gut long and simple, without swellings; anus near end of tail; postanal distance 3–20% SL
- Dorsal fin short; origin just before level of anus
- Head and snout concave dorsally; small nasal capsule
- Midline pigment includes an internal series of spots on top of notochord, head to tail
- 4 subcutaneous pigment spots just below midline, the 1st unpaired, last 3 paired
- Gut pigment includes small spots on top of intestine from 20th myomere to anus
- Head pigment lacking
- At transformation, anus migrates well forward; preanal vertebrae in adults 9–15
- Maximum leptocephalus size 260 mmSL

Note:

1. Lateral melanophores subject to change with growth; posterior 3 spots appear earliest, the anteriormost spot appears at about 20–30 mmSL; initially these spots are large and conspicuous, and the 2nd and 3rd are low on body (almost touching ventral edge); all 4 spots become smaller and more compact as leptocephalus grows, and 2nd and 3rd migrate upwards, toward midline. In older individuals, some of these spots may disappear.
2. Preanal myomeres increase in number with growth; there are fewer than 100 in small leptocephali, 230–260 in leptocephali >100 mm.
3. Leptocephali <80 mm occur in depths of 0–100 m; those >80 mm occur below 100 m during the day, above 100 m at night (Castonguay and McCleave, 1987)

Meristic Characters

Myomeres:	300–400
Vertebrae:	300–400
Dorsal fin rays:	170–253 ¹
Anal fin rays:	186–273 ¹
Pectoral fin rays:	10–14
Pelvic fin rays:	none

¹ Number of rays anterior to 200th vertebra

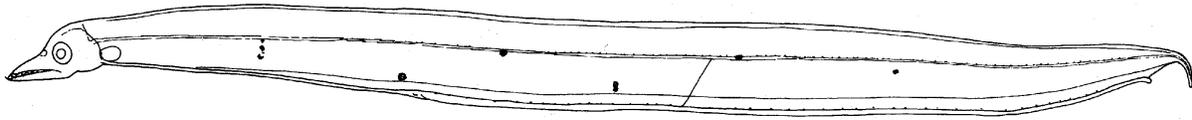
Figures: Adult: E.N. Fischer (Bigelow and Schroeder, 1953); A: Mary Fuges (Smith, 1989b)

References: Nielsen and Smith, 1978; Smith and Nielsen, 1989; Smith, 1989b

Nemichthys scolopaceus

Predorsal myomeres 232-242

Total myomeres 300-400

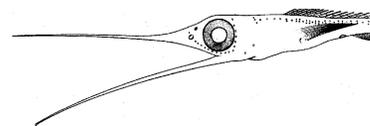


A. 36 mmSL

Preanal myomeres 93-257 (# increases with growth)
Last vertical blood vessel at myomere 83-94

Nemichthys curvirostris* (Strömman, 1896)*Nemichthyidae**

No common name



Range: North Atlantic Ocean at least as far north as 40°N; absent from Caribbean Sea and northern coast of South America; also occurs in eastern South Atlantic, Indian Ocean, and much of South Pacific

Habitat: Mesopelagic, mostly between 100 and 2,000 m; not as common as its congener, *Nemichthys scolopaceus*

Spawning: Most larval evidence suggests a winter peak in spawning, at least in Gulf of Mexico; larval duration has been estimated at 8–10 months. However, leptocephali are commonly collected in study area in Apr (rarely Aug) suggesting spawning the previous summer.

Eggs: – Undescribed

Larvae:

- Body long and slender; body depth 3–7% SL; tail very attenuate
- Gut long and simple, without swellings; anus near end of tail; postanal distance 3–12% SL
- Dorsal fin short; origin just before level of anus
- Head and snout concave dorsally; small nasal capsule
- Midline pigment includes an internal series on top of notochord, head to tail
- Small leptocephali (only) have 2 (or fewer) melanophores along ventral edge of body (at myomere 41–47 and 82–90); disappear with growth
- Gut pigment includes small spots on top of intestine, from about 10th myomere to anus
- Head pigment lacking
- At transformation, anus migrates well forward; preanal vertebrae in adults 10–14
- Maximum leptocephalus size 378 mmTL

Note: 1. Preanal myomeres increase in number with growth; there may as few as 116 in small leptocephali, 310–320 in leptocephali >125 mm

Meristic Characters

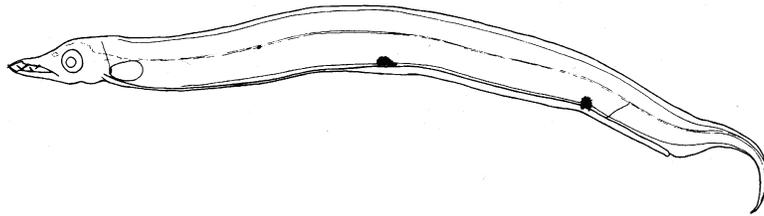
Myomeres:	300–400
Vertebrae:	300–400
Dorsal fin rays:	157–210 ¹
Anal fin rays:	151–213 ¹
Pectoral fin rays:	8–12
Pelvic fin rays:	none

¹ Number of rays anterior to 200th vertebra

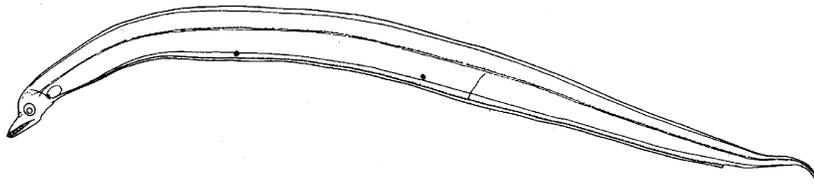
Figures: Adult (head): Nielsen and Smith, 1978 (reversed); A–E: Mary Fuges (Smith, 1989b)

References: Nielsen and Smith, 1978; Smith and Nielsen 1989; Smith, 1989b

Nemichthys curvirostris



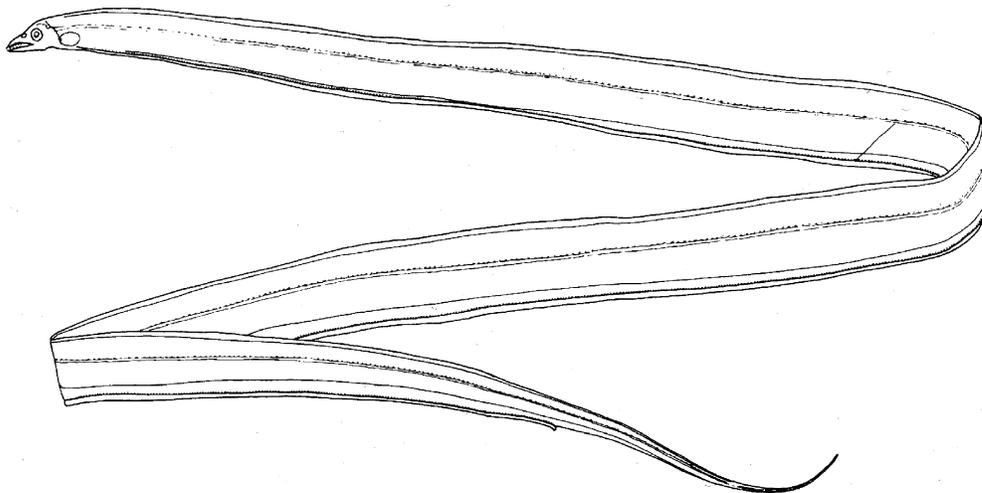
A. 14 mmSL



B. 40 mmSL

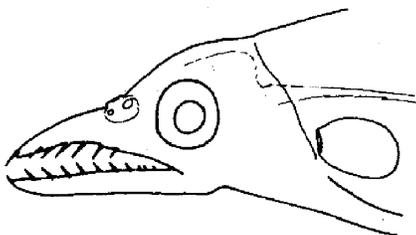
Predorsal myomeres 294-307

Total myomeres 300-400



C. 285 mmSL

Preanal myomeres 116-320 (# increases with growth)
Last vertical blood vessel at myomere 85-107



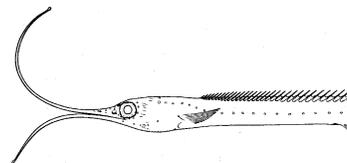
**D. 285 mmSL
(Head Detail)**



**E. 285 mmSL
(Gastric Region)**

Avocettina infans* (Günther, 1878)*Nemichthyidae**

No common name



Range: Atlantic Ocean between 40°N and 10°S, including the Gulf of Mexico and Caribbean Sea; also northern Indian Ocean and much of Pacific Ocean

Habitat: Mesopelagic, mostly between 1,200 and 2,000 m; common

Spawning: Presumably a prolonged season; leptocephali rarely collected in study area in Oct

Eggs: – Undescribed

Larvae:

- Body long and slender, but less so than in leptocephali of *Nemichthys*
- Body depth 7–13% SL; tail not sharply attenuate
- Gut long and simple, without swellings; anus near end of tail; post-anal distance 2–9% SL
- Dorsal fin short; origin just before level of anus
- Head and snout concave dorsally; small nasal capsule
- Midline pigment includes an internal series on top of notochord, head to tail
- 3 internal pigment spots on lower half of body (see note 1)
- Gut pigment includes small spots on top of intestine from gastric region to anus; another series on bottom of esophagus
- Head pigment lacking
- At transformation, anus migrates well forward; preanal vertebrae in adults 17–22
- Maximum leptocephalus size 150 mmSL

Meristic Characters

Myomeres: 192–201

Vertebrae: 187–202

Dorsal fin rays: 130–210¹Anal fin rays: 103–176¹

Pectoral fin rays: 14–18

Pelvic fin rays: none

¹ Number of rays anterior to 200th vertebra

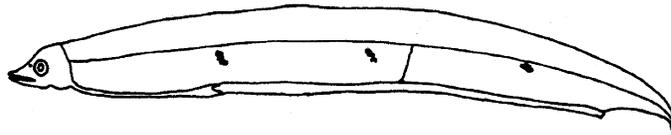
Note:

1. Each of the 3 internal spots begins as a cluster of prominent spots, diagonally oriented, in small specimens; these remain diagonally arranged, but fade in larger specimens
2. Preanal myomeres increase in number with growth; there may as few as 132 in small leptocephali, 170–180 in leptocephali >40 mm.
3. Experiments in the Sargasso Sea demonstrate that leptocephali are usually concentrated in upper 100 m of water column at night; not many collected during the day, suggesting net avoidance. (See Castonguay and McCleave, 1987)

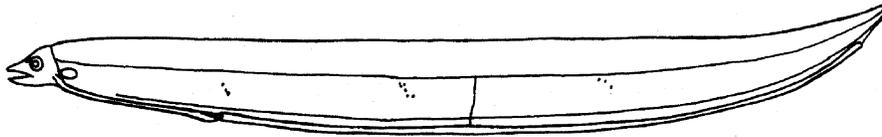
Figures: Adult: Nielsen and Smith, 1978 (reversed); A–E: Smith, 1979

References: Nielsen and Smith, 1978; Smith and Nielsen, 1989; Smith, 1989b

Avocettina infans



A. 20 mmSL



B. 45 mmSL

Predorsal myomeres 162-171

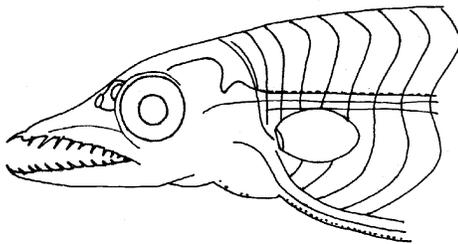
Total myomeres 192-201



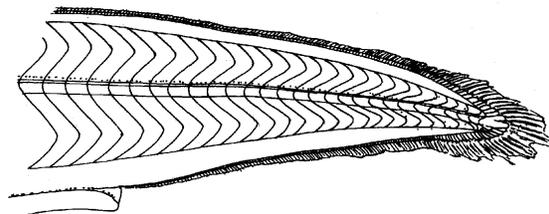
C. 113 mmSL

Preanal myomeres 132-178

Last vertical blood vessel at myomere 72-77



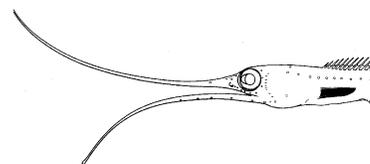
**D. 113 mmSL
(Head Detail)**



**E. 113 mmSL
(Caudal Area)**

Labichthys carinatus* Gill and Ryder, 1883*Nemichthyidae**

No common name



Range: Atlantic Ocean from Gulf Stream near Georges Bank, through Bermuda, the Sargasso Sea, Bahamas, Gulf of Mexico and West Indies to Brazil; also central Atlantic Ocean to Africa

Habitat: Mesopelagic, mostly below 1,200 m (in Sargasso Sea); common in certain oceanic areas (e.g. Sargasso Sea and central North Atlantic)

Spawning: Undescribed, but presumably a prolonged season; leptocephali rarely collected in study area in Aug

Eggs: – Undescribed

Larvae:

- Body long and slender, but less so than in leptocephali of *Nemichthys*
- Body depth 8% SL; tail not sharply attenuate
- Gut long and simple, without swellings; anus near end of tail; postanal distance 6–8% SL
- Dorsal fin short; origin just before level of anus
- Head and snout concave dorsally; small nasal capsule
- Midline pigment includes an internal series on top of notochord, head to tail, but no other lateral pigment
- Gut pigment includes small spots on top of intestine from gastric region to anus; another series along underside of esophagus from heart to liver
- Small leptocephali have 2 large melanophores (or 2 clusters of smaller spots) along gut, one near gastric region, one near myomere 68
- Head pigment lacking
- At transformation, anus migrates well forward; preanal vertebrae in adults 9–11
- Maximum leptocephalus size 118 mmSL

Meristic Characters

Myomeres: 179–182

Vertebrae: 172–18¹Dorsal fin rays: 114–180¹Anal fin rays: 134–181¹

Pectoral fin rays: 12–14

Pelvic fin rays: none

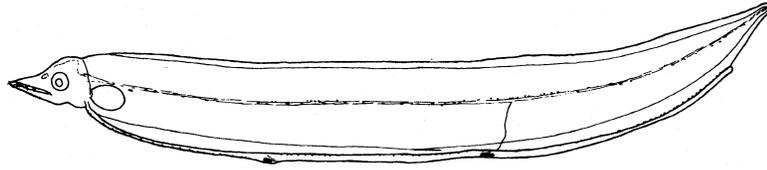
¹ Number of rays anterior to 200th vertebra

Note: 1. Preanal myomeres increase in number with growth; there may as few as 130 in small leptocephali, 157 in larger leptocephali

Figures: Adult: Nielsen and Smith, 1978 (reversed); A–C: Mary Fuges (Smith, 1989b)

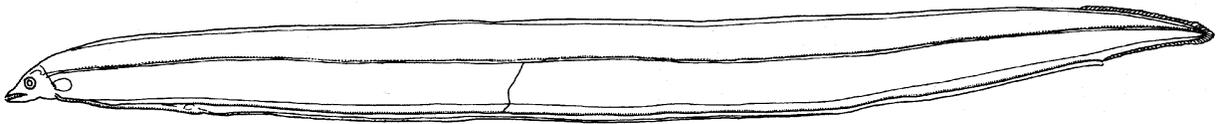
References: Nielsen and Smith, 1978; Smith and Nielsen, 1989; Smith, 1989b

Labichthys carinatus

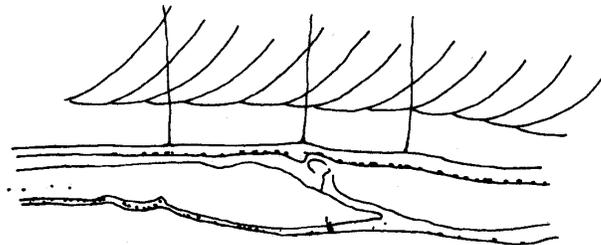


A. 20 mmSL

Predorsal myomeres 153 Total myomeres 179-182



B. 118 mmSL Preanal myomeres 130-157 (see note)
Last vertical blood vessel at myomere 73-74



C. 118 mmSL
(Gastric Region)