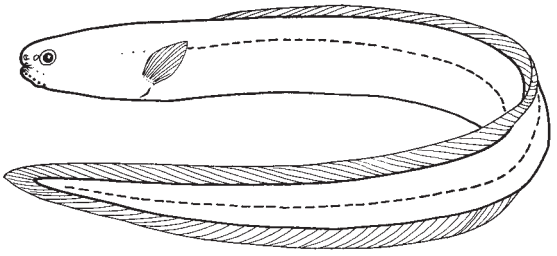
SYNAPHOBRANCHIDAE

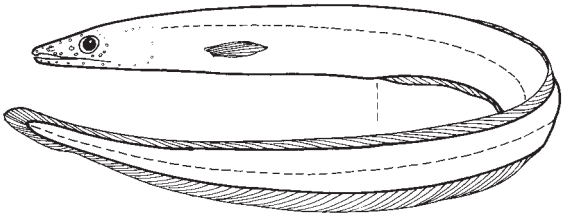
Cutthroat eels

by D.G. Smith, National Museum of Natural History, Washington, D.C., USA

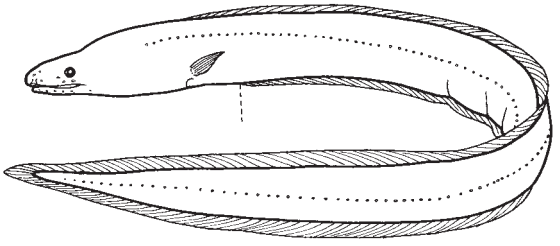
Diagnostic characters: Small to medium-sized eels, the largest species reaching 1.8 m, but most less than 1 m. Body stout to elongate, anus usually well in front of midbody. Head variable. Eye well developed to reduced. Snout may be short and blunt or moderately elongate. Mouth usually large, gape extending behind rear margin of eye; lips without a fleshy flange; jaws nearly equal, sometimes snout projects slightly beyond lower jaw and sometimes vice versa. Anterior nostril tubular, near tip of snout; posterior nostril on side of snout, at or below mideye level. **Teeth usually small and conical, in 1 to several rows on jaws and vomer; some species have enlarged, compound teeth on vomer, but large fangs never present. Gill openings low on body, below pectoral fins (when present); sometimes the gill openings of the 2 sides united in a ventral slit**. Dorsal and anal fins well developed, confluent with caudal fin. Pectoral fins present or absent. **Scales present or absent**. Lateral line variable, often complete, sometimes reduced to a few pores at anterior end and sometimes no pores at all. **Colour:** plain brown or grey, sometimes countershaded. No distinctive markings.



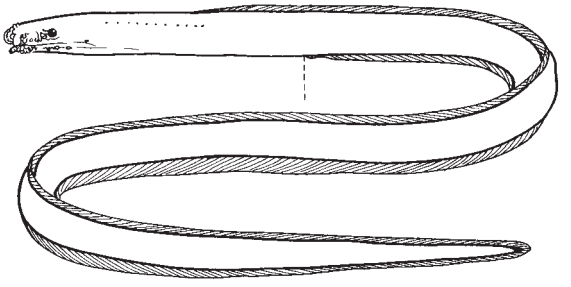
Simenchelys parastica (Simenchelyinae)



Synaphobranchus kaupi (Synaphobranchinae)



Dysomma anguillare (Ilyophinae)



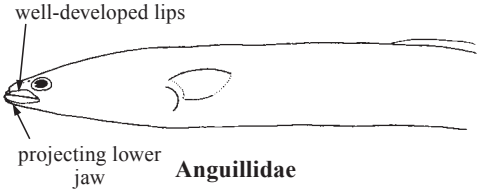
Dysomma brevirostre (Ilyophinae)

Habitat, biology, and fisheries: Synaphobranchids are benthic eels, some living in very deep water. *Simenchelys* is a scavenger, feeding on dead fish and sometimes burrowing into the carcass; this habit led to the mistaken idea that it is a parasite. Synaphobranchines are more generalized predators, living on small fishes and invertebrates. Most synaphobranchines live in fairly deep water, and some species are quite common in their depth range. Ilyophines, with a few exceptions, are rare and seldom seen. Many of them seem to live in specialized habitats that are difficult to sample. The Ilyophinae is the most speciose subfamily, judging from the great variety of leptocephali that have been collected; most of these larvae cannot be identified with a known adult, indicating that many species still await discovery. Synaphobranchids are of little or no importance to fisheries, although they are sometimes taken in deep trawls.

Remarks: The Synaphobranchidae is divided into 3 subfamilies. The Simenchelyinae contains a single genus and species, *Simenchelys parasitica*. It is distinguished by its peculiar snub-nosed appearance, caused by the extreme shortening of the jaws. Aside from this feature, it is relatively generalized, with a moderately elongate body, well-developed fins, and the anus slightly ahead of midbody. It is covered with small, embedded scales. The Synaphobranchinae contains those species most typical of the family. They are relatively generalized eels, except for the tendency of the gill openings on each side to converge toward the ventral midline. Most species have embedded scales, the eye and fins are well developed, and the jaws are moderately elongate.The Ilyophinae is the most speciose and morphologically diverse of the synaphobranchid subfamilies. Ilyophines show great variety in body shape, dentition, presence or absence of pectoral fins, eye size, and ornamentation of the snout. Most lack scales. In some species, the anus is located far forward, nearly under the pectoral fins.

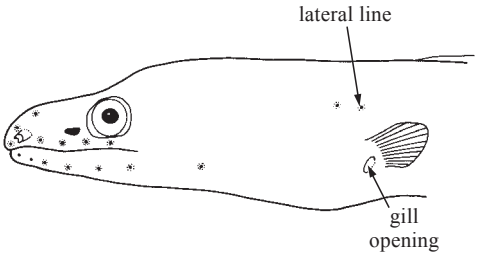
Similar families occurring in the area

Anguillidae: are the only other eels that have scales. Anguillids have prominent fleshy flanges on the lips, and the lower jaw projects beyond the upper.

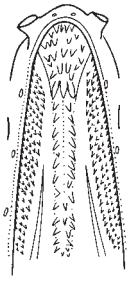


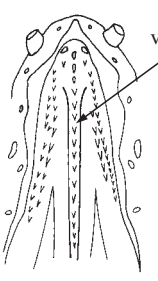
Anguillidae

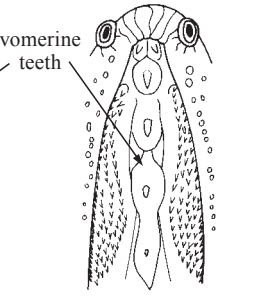
Chlopsidae: some ilyophines have a reduced lateral line and resemble chlopsids. Chlopsids also have the posterior nostril low on the side of the snout, further enhancing the resemblance. Most chlopsids have more than 1 row of teeth on the vomer; 1 genus (*Robinsia*) has a single row, but they are simple, not compound. Chlopsids almost always have 1 or 2 pores in the lateral line, at the anterior end of the canal. Of the known ilyophines, *Linkenchelys* has 4 or 5 pores, and *Dysommina* has none, but no species has 1 or 2.



Chlopsidae


Chlopsidae
Kaupichthys


Chlopsidae
Robinsia

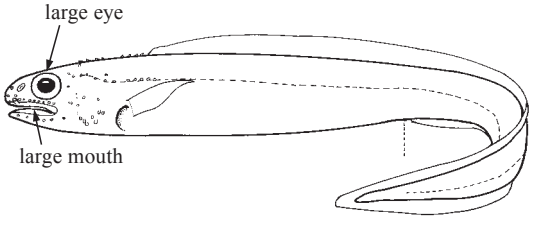


Synaphobranchidae

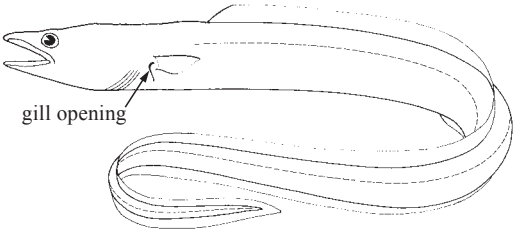
roof of mouth

Colocongridae: have a short, blunt snout somewhat like *Simenchelys*, but they have a larger eye and mouth, lack scales, and the anus is far behind midlength.

Congridae: some of the more generalized synaphobranchids may be mistaken for congrids. Congrids lack scales and have the gill opening more lateral in position and closer to the pectoral fins. Many, though not all, congrids have fleshy flanges on the lips. Most have the posterior nostril at or above mideye, and the gill openings are lateral rather than ventral.



Colocongridae

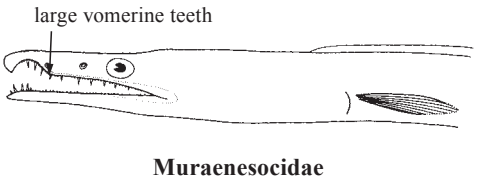


Congridae

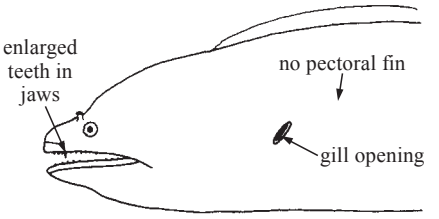
Muraenesocidae: have a large mouth and enlarged teeth on the vomer, as do some ilyophines. In muraenesocids, however, the enlarged teeth are single and not compound as in ilyophines.

Muraenidae: lack pectoral fins, as do some ilyophines, but the gill opening is very small and pore-like. Muraenids usually have enlarged teeth, but these are on the jaws and intermaxillary plate; the vomerine teeth are small. Muraenids have 1 or 2 pores in the lateral line, at the anterior end of the canal.

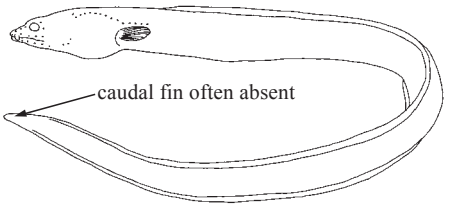
Ophichthidae: in many ophichthids the caudal fin is absent, and the tip of the tail is hard and pointed. Ophichthids have the posterior nostril low on the snout, but in most species it is actually on the lip or within the mouth; in synaphobranchids, the nostril is always above the lip. Those ophichthids with the nostril above the lip have a swollen throat with many overlapping branchiostegal rays, detached from the hyal bones and forming a basket-like structure. In synaphobranchids, the throat is not swollen; the branchiostegals are less numerous and are attached to the hyal bones. Ophichthids usually have a median supraorbital pore, which synaphobranchids lack.



Muraenesocidae



Muraenidae



Ophichthidae

Key to the species of Synaphobranchidae occurring in the area

Note: The species of *Synaphobranchus* can be difficult to identify. The distinguishing characters are not always clear. The scale shape can be ambiguous, and the dorsal origin is variable because some of the anterior pterygiophores do not bear rays. Sometimes the vertebral count is the only way to identify a specimen with certainty.

1a. Head anterior to eyes extremely short, mouth a sphincter-like slit with gape not extending posterior to anterior nostril (Fig. 1) . . . . . ***Simenchelys parasitica***

1b. Head more elongate, mouth extends to level of posterior edge of eye or beyond . . . . . → *2*

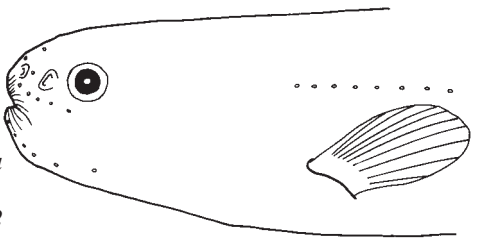


Fig. 1 lateral view of head (*Simenchelys*)

2a. Gill openings on the 2 sides united as a longitudinal slit on ventral midline (Fig. 2); scales present . . . . . → *3*

2b. Gill openings separate, although they may be closely approximated; scales present or absent . . . . . → *6*

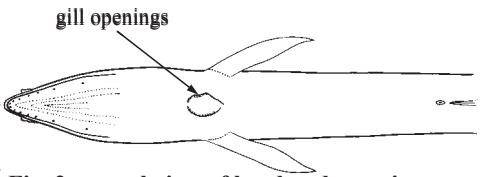


Fig. 2 ventral view of head and anterior part of body

3a. Scales elongate to oval (Fig. 3a, b) . . . . . → *4*

3b. Scales rounded (Fig. 3c, d) . . . . . → *5*

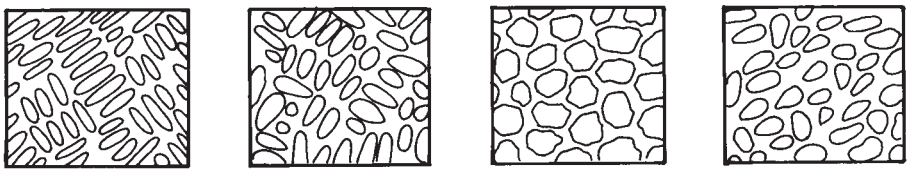


Fig. 3 patterns and shapes of body scales

4a. Scales very elongate (3 to 4 times as long as wide), small, regularly arranged in aligned clusters of 4 or 5 set at right angles to other such groups (Fig. 3a); vertebrae 143 to 153; dorsal-fin origin well behind level of anus (Fig. 4a); vomerine teeth uniserial but zig-zag anteriorly . . . . . ***Synaphobranchus kaupi***

4b. Scales oval, not so regularly arranged (Fig. 3b); vertebrae 128 to 140; dorsal-fin origin at or just posterior to level of anus (Fig. 4b); vomerine teeth uniserial . . . . . ***Synaphobranchus affinis***

a) ***Synaphobranchus kaupi*** **b)** ***Synaphobranchus affinis***

Fig. 4 lateral view of head and body

5a. Scales large, polygonal or rounded (Fig. 3c); vertebrae 140 to 150; predorsal length 2.9 to 3.2 in total length; vomerine teeth uniserial except for short anterior patch or a few teeth in a roughly biserial arrangement . . . . . ***Synaphobranchus oregoni***

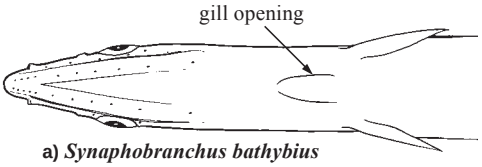
5b. Scales small, rounded or oval, irregularly arranged (Fig. 3d); vertebrae 130 to 140; predorsal length 1.9 to 2.2 in total length; vomerine teeth irregularly biserial anteriorly, forming small expanded portion at tip . . . . . ***Synaphobranchus brevidorsalis***

6a. Scales present . . . . . → ***7***

6b. Scales absent . . . . . → ***9***

7a. Gill openings nearly parallel, separated by much less than their length (Fig. 5a); vertebrae 125 to 135 . . . . . ***Synaphobranchus bathybius***

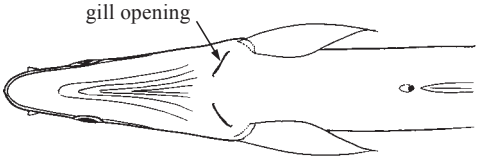
7b. Gill openings divergent or parallel, but separated by more than their length; vertebrae 145 or more . . . . . → ***8***



a) ***Synaphobranchus bathybius***

8a. Gill openings strongly divergent, anterior ends separated by a distance about equal to their length, posterior ends separated by about 1.5 to 2 times their length (Fig. 5b); jaws approximately equal; vertebrae 164 to 173 . . . . . ***Synaphobranchus capensis***

8b. Gill openings parallel or nearly so, separated by a distance about equal to their own length (Fig. 5c); snout projecting slightly beyond tip of lower jaw; vertebrae 145 to 151 . . . . . ***Ilyophis brunneus***



b) ***Synaphobranchus capensis***

9a. Head distinctly shorter than trunk . . ***Haptenchelys texis***

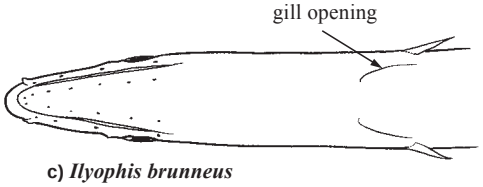
9b. Head equal to or longer than trunk . . . . . → ***10***

10a. Pectoral fin present . . . . . → ***11***

10b. Pectoral fin absent . . . . . → ***14***

11a. Trunk very short, anus under or shortly behind tip of appressed pectoral fin . ***Dysomma anguillare***

11b. Trunk longer, anus well behind tip of appressed pectoral fin . . . . . → ***12***



c) ***Ilyophis brunneus***

Fig. 5 ventral view of head

12a. Intermaxillary teeth present in a well developed, rounded patch (Fig. 6); body distinctly bicoloured for most of its length, dark above and pale below . . . . . ***Atractodenchelys phrix***

12b. Intermaxillary teeth absent (Fig. 7); body not bicoloured . . . . . → ***13***

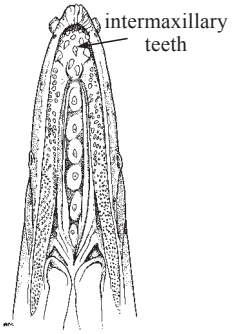


Fig. 6 roof of mouth ***(Atractodenchelys phrix)***

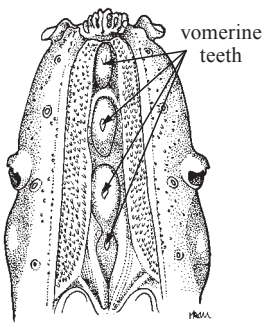


Fig. 7 roof of mouth ***(Dysommina rugosa)***

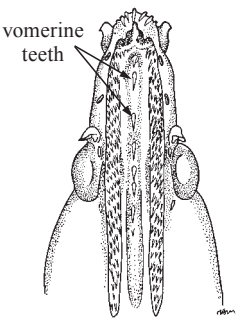


Fig. 8 roof of mouth ***(Linkenchelys multipora)***

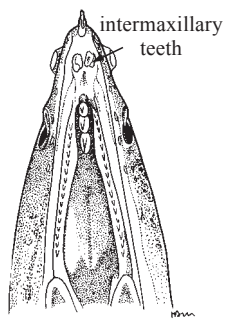


Fig. 9 roof of mouth ***(Dysomma tridens)***

13a. Four large, compound vomerine teeth in a single row, each tooth enclosed in a pad of papillose tissue (Fig. 7); no lateral-line pores on body . . . . . ***Dysommina rugosa***

13b. Approximately 8 slender, simple vomerine teeth, not enclosed in a pad of papillose tissue (Fig. 8); 4 or 5 pores at anterior end of lateral line, in front of level of pectoral fin . . . . . ***Linkenchelys multipora***

14a. Three large, compressed intermaxillary teeth projecting downward from tip of snout in front of lower jaw (Fig. 9); snout rugose with some papillae . . . . . ***Dysomma tridens***

14b. Two intermaxillary teeth, side by side, not projecting outside mouth; snout and tip of lower jaw bulbous, heavily ornamented with papillae and ridges . . . . . ***Dysomma brevirostre***

List of species occurring in the area

Note: There is some uncertainty over the generic allocations of many of the species in this family. Some authors place the species *capensis* in the genus *Diastobranchus* and *bathybius* in *Histiobranchus*, rather than placing both in *Synaphobranchus*. The species *anguillare* has at times been placed in the genus *Sinomyrus* and *brevirostre* in *Nettodarus*; they are both placed in *Dysomma* here. These arrangements are to some extent arbitrary, but the system followed here is that of the most recent revision of the family (Robins and Robins, 1989).

Atractodenchelys phrix Robins and Robins, 1970. To 70 cm. Caribbean and E coast of Florida.

Dysomma anguillare Barnard, 1923. To 45 cm. Worldwide.

Dysomma brevirostre (Facciolà, 1887). To 25 cm. E and W Atlantic (incl. Mediterranean), central Pacific.

Dysomma tridens Robins, Böhlke, and Robins, 1989. Known from 1 specimen, 21.7 cm, from Belize.

Dysommina rugosa Ginsburg, 1951. To 35 cm. Worldwide.

Haptenchelys texis Robins and Martin, 1976. To 55 cm. E and W Atlantic.

Ilyophis brunneus Gilbert, 1891. To 60 cm. Worldwide.

Synaphobranchus affinis Günther, 1877. To 46 cm. Worldwide.

Synaphobranchus bathybius Günther, 1877. To 75 cm. Worldwide.

Synaphobranchus brevidorsalis Günther, 1887. To 120 cm. Worldwide.

Synaphobranchus capensis (Barnard, 1923). To 180 cm. Previously known from S Africa, Australia, and New Zealand, but recently reported from off New England and may extend into the area.

Synaphobranchus kaupi Johnson, 1862. To 85 cm. Worldwide.

Synaphobranchus oregonii Castle, 1960. To 70 cm. Gulf of Mexico, Caribbean, Straits of Florida.

Reference

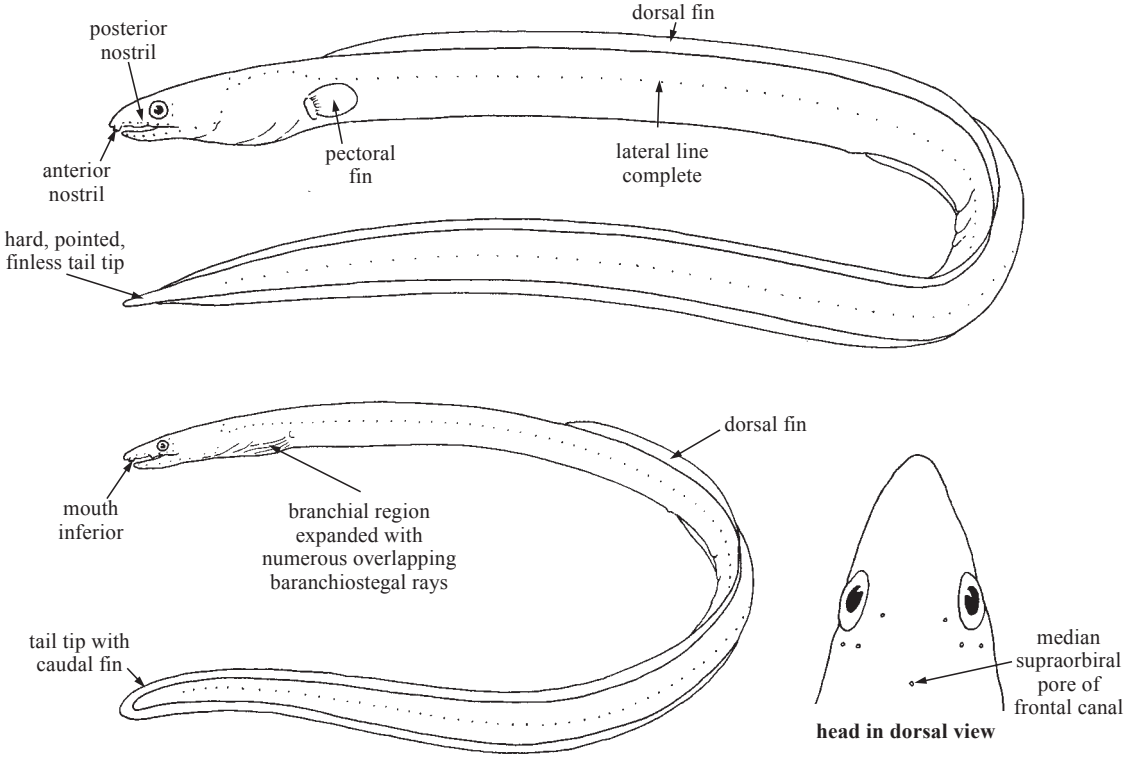
Robins, C.H. and C.R. Robins. 1989. Family Synaphobranchidae. In Fishes of the Western North Atlantic, edited by E.B. Böhlke. *Mem. Sears Found. Mar. Res.*, 1(9):207-253.

OPHICHTHIDAE

Snake eels (shrimp eels, worm eels, and sand eels)

by J.E. McCosker, California Academy of Sciences, USA

Diagnostic characters: Elongate eels, snake-like or worm-like, cylindrical anteriorly, cylindrical or compressed posteriorly, most about 50 cm or less, some reaching 250 cm. Eye size variable, from well developed to rudimentary. Snout pointed or rounded; **nostrils** widely separated, the anterior usually in a short tube, **the posterior of most species along edge of upper lip or opening within mouth**. Mouth moderate to large, terminal or inferior. Gill openings midlateral to entirely ventral, ranging from constricted (subfamily Myrophinae) to an elongate slit (subfamily Ophichthinae). **Branchial region expanded and reinforced by numerous overlapping branchiostegal rays**. Dorsal and anal fins present or absent, rarely elevated; pectoral fins present or absent; pelvic fins absent; **caudal fin present or absent, when absent tip of tail is often hard and pointed**. Scales absent. **Lateral line** complete; often with well-developed pores on head and body, **right and left sides connected by a frontal and a temporal canal on head; median pore usually present in frontal canal**. Gas bladder present, often reduced. **Colour:** highly variable, from uniform light or dark to patterns of spots, stripes, bands, bars, or saddles; usually darker on dorsal surface.



Habitat, biology, and fisheries: The Ophichthidae is the most diverse and speciose family of true eels, occupying tropical and subtropical habitats including nearshore sand and mud bottoms, estuaries, and coral reefs, ranging from the sandy intertidal to midwater depths of 800 m; however, most live shallower than 200 m. They are often extremely abundant and probably are important forage items for many species. Ophichthids are more characteristic of continental waters than of islands. Their sharp snouts and tails and their often muscular and cylindrical bodies are well adapted for burrowing, and many species spend most of their adult lives buried in the shallow sediment. Some come out at night to forage over the bottom and juveniles and adults are sometimes collected at the surface around a light. Like all eels, ophichthids have a pelagic leptocephalus larva. Various species of larger ophichthids, subfamily Ophichthinae, are caught throughout the area, however no directed fishery exists for them. They are taken by trawl or by hook-and-line but are undesirable due to the numerous intramuscular bones, and are rarely consumed. Although not particularly aggressive, some of the larger snake eels will bite if handled carelessly.

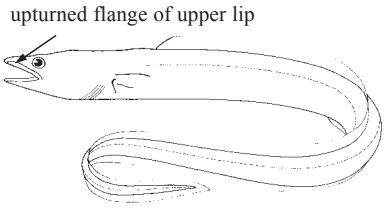
Similar families occurring in the area

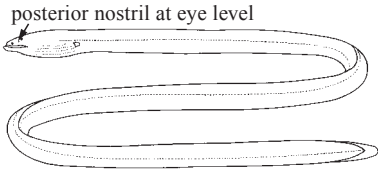
All ophichthids differ from other eels in having numerous overlapping branchiostegal rays. Most ophichthids differ from most other eels in having the posterior nostril within the lip or opening inside the mouth. The subfamily Ophichthinae is further distinguished from all other eels by its hard, pointed, finless tail tip.

Congridae: some congrids, particularly the garden eels (subfamily Heterocongrinae), have a reduced caudal fin, but some caudal-fin rays are nearly always present, and the tail tip is not hard and pointed. The heterocongrines are further distinguished by their short snout and the prominent upturned flange on the upper lip. Members of the ophichthid subfamily Myrophinae have a caudal fin, however they are distinguished from other eels by their posterior nostril condition and the presence of a median pore in the transverse frontal canal on the head.

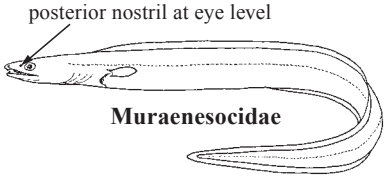
Moringuidae: moringuids are also burrowing eels and may superficially resemble some of the small-eyed ophichthids. Moringuids have a caudal fin, the posterior nostril at the level of the eye, and lack the numerous and overlapping branchiostegal rays.

Muraenesocidae: they differ in having the posterior nostrils at the level of the eye and a median series of very large teeth, flanked by a row of small teeth, along the vomer.





Moringuidae



Muraenesocidae

Key to the species of Ophichthidae occurring in the area

1a. Tail tip flexible, caudal-fin rays not conspicuous, confluent with dorsal and anal fins (Fig. 1a); gill opening midlateral, a opening constricted (Fig. 2) . . . . . **(Myrophinae)** → *2*

1b. Tail tip a hard or fleshy finless point (Fig. 1b); gill opening midlateral to entirely ventral, unconstricted (Fig. 3)

. . . . . **(Ophichthinae)** → *11*

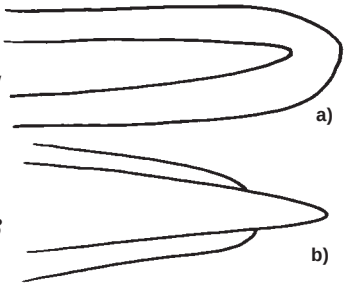


Fig. 1 lateral view of tail

2a. Posterior nostril before eye, above upper lip and not covered by a flap (Fig. 4a); pectoral fins present, but may be reduced to small, barely noticeable flaps in posterodorsal corner of gill opening . . . . . ***(Pseudomyrophis)*** → *3*

2b. Posterior nostril labial, either within lip and opening into mouth, or along lip and covered by a flap (Fig. 4b); pectoral fins well developed or minute . . . . . → *5*

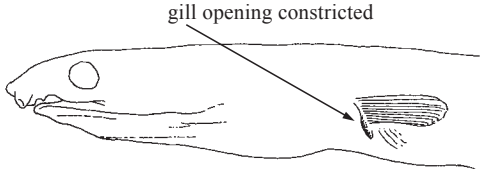


Fig. 2 lateral view of head (Myrophinae)

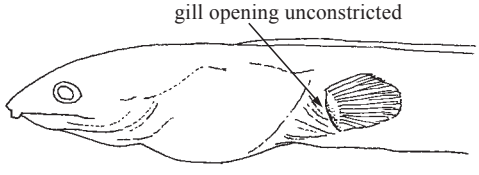


Fig. 3 lateral veiw of head (Ophichthinae)

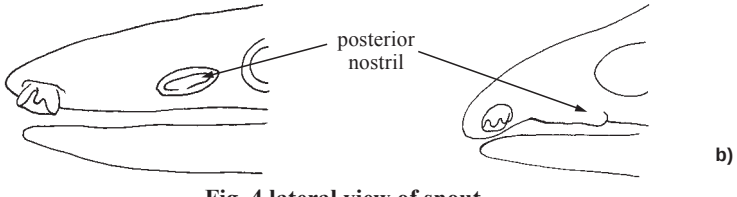


Fig. 4 lateral view of snout

3a. Body extremely elongate, its depth 1 to 1.5% of total length; head 5.2 to 6.1% of total length; dorsal-fin origin behind midtrunk; total vertebrae 213 to 217 . . . . . ***Pseudomyrophis nimius***

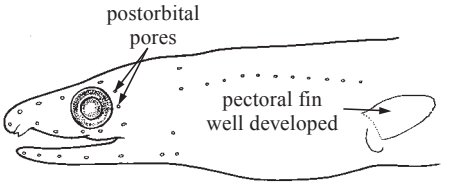
3b. Body elongate, its depth at or greater than 1.5% total length; head length greater than 6.9% total length; dorsal-fin origin about at midtrunk; total vertebrae less than 200 . . . . . → ***4***

4a. Head length 6.9 to 7.8% total length; body depth 1.5 to 2.2% total length; total vertebrae 184 to 191 . . . . . ***Pseudomyrophis frio***

4b. Head length 9.5 to 9.7% total length; body depth 2.1 to 2.4% total length; total vertebrae 155 to 159 . . . . . ***Pseudomyrophis fugesae***

5a. Pectoral fins well developed (Fig. 5a); dorsal-fin origin from anterior trunk region to behind anus; pleural ribs absent behind fifteenth to twentieth vertebrae . . . . . → ***6***

5b. Pectoral fins minute (Fig. 5b); dorsal-fin origin in midtrunk region; pleural ribs present on all trunk vertebrae . . . . . ***Mixomyrophis pusilipinna***



a) ***Myrophis platyrhynchus***

b) ***Mixomyrophis pusilipinna***

Fig. 5

6a. Dorsal-fin origin above or behind anus; vomerine teeth absent . . . . . ***Ahlia egmontis***

6b. Dorsal-fin origin anterior to midtrunk region; vomerine teeth present . . . . . → ***7***

7a. Body elongate, its depth more than 70 times in total length; teeth slender, slightly depressible; posterior nostril on lip and covered by flap . . . . . ***Asarcenchelys longimanus***

7b. Body stouter, its depth less than 50 times in total length; teeth stouter, not depressible; posterior nostril opens into mouth . . . . . ***(Myrophis)*** → ***8***

8a. Two postorbital pores (Fig. 5a), 1 behind upper half of eye and 1 behind mideye (dorsal-fin origin about midway between snout tip and anus; 19 to 22 predorsal vertebrae) . . . . . ***Myrophis platyrhynchus***

8b. One postorbital pore behind upper half of eye . . . . . → ***9***

9a. Dorsal-fin origin greater than twice head length behind snout tip, about midway between gill opening and anus; 30 to 34 predorsal vertebrae . . . . . ***Myrophis punctatus***

9b. Dorsal-fin origin less than twice head length behind snout tip; 30 or fewer predorsal vertebrae . . . . . → ***10***

10a. Dorsal-fin origin behind gill opening by 1 or 2 times the pectoral-fin length; 14 to 17 predorsal vertebrae, 45 to 49 preanal vertebrae . . . . . ***Myrophis anterodorsalis***

10b. Dorsal-fin origin behind gill opening by more than 3 times the pectoral-fin length, before midpoint between gill opening and anus; 26 to 30 predorsal vertebrae, 51 to 57 preanal vertebrae . . . . . ***Myrophis plumbeus***

11a. Dorsal fin present, generally elevated, its origin on nape above supraoccipital; pectoral fins absent; gill openings inferior, parallel or converging forward, isthmus narrower than gill opening length . . . . . → ***12***

11b. Dorsal fin, if present, arises behind nape; pectoral fins present or absent; gill openings inferior or lateral . . . . . → ***17***

12a. Anal fin absent; anterior nostril a hole, without a raised rim; head brown or black, body not spotted, with white markings, dorsal fin white . . . . . ***Letharchus velifer***

12b. Anal fin present . . . . . ***→ 13***

13a. Median groove on underside of snout extends to and beyond anterior nostril bases (Fig. 6); vomerine and intermaxillary teeth present . . . . . ***(Callechelys) → 14***

13b. Underside of snout not incised anteriorly (Fig. 7); vomerine teeth absent . ***Aprognathodon platyventris***

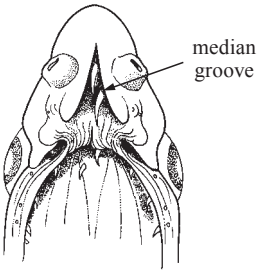


Fig. 6 underside of snout (*Callechelys*)

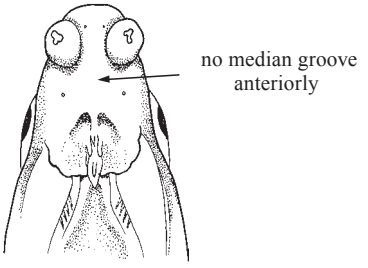


Fig. 7 underside of snout (*Aprognathodon platyventris*)

14a. Body coloration strongly delineated with alternating black and white stripes running the length of the body . . . . . ***Callechelys bilinearis***

14b. Body covered with numerous brown to black spots. . . . . ***→ 15***

15a. Body moderately elongate, its depth 2.6 to 3.7% total length; head 7.0 to 8.8% total length; jaw teeth numerous, 7 to 11 on each maxilla, 11 to 17 on each mandible; total vertebrae 169 to 186 . . . . . ***Callechelys muraena***

15b. Body elongate, its depth 1.7 to 2.2% total length; head 5.6 to 7.1% total length; jaw teeth fewer, 4 to 5 on each maxilla, 9 to 11 on each mandible; total vertebrae 169 to 186 . . . . . ***→ 16***

16a. Dorsal spots of large individuals coalesced into dark saddles; preanal vertebrae 107 or 108, total vertebrae 169 to 171 . . . . . ***Callechelys springeri***

16b. Dorsal spots of large individuals not coalesced into saddles; preanal vertebrae 111 to 121, total vertebrae 171 to 186 . . . . . ***Callechelys guineensis***

17a. Pectoral fins present, generally as large as or larger than eye (smaller in 1 species); coloration various, including plain and spotted species . . . . . ***→ 31***

17b. Pectoral fins absent or vestigial; median fins reduced or absent; coloration without large spots . . . . . ***→ 18***

18a. Gill openings entirely ventral or nearly so; head pores developed, 3 or 4 preopercular pores present (Fig. 8); all fins may be absent . . . . . ***→ 19***

18b. Gill openings low lateral, crescentic; head pores reduced, 2 preopercular pores (Fig. 9); at least a dorsal fin present . . . . . ***→ 22***

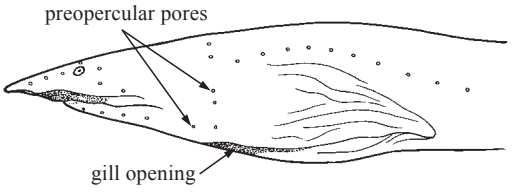


Fig. 8 lateral view of head

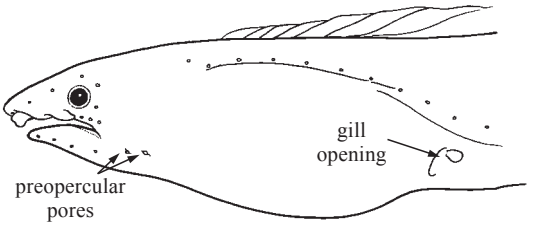


Fig. 9 lateral view of head

19a. All fins absent; anterior nostril either a hole or within a tube . . . . . → ***20***

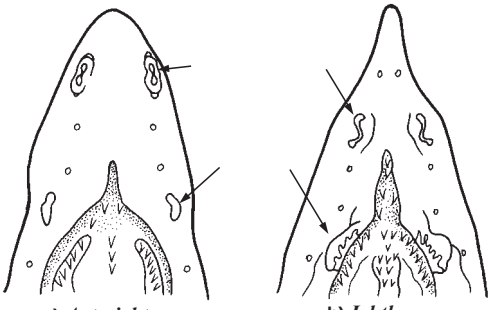
19b. Median fins present, although sometimes low and difficult to observe; anterior nostril a hole, not within a tube . . . . . ***Stictorhinus potamius***

20a. Posterior nostril opening outside mouth, with a flap; anterior nostril tubular (Fig. 10a); eye moderately developed . . . . . ***(Apterichtus)*** → ***21***

20b. Posterior nostril opening inside mouth, with or without a flap; anterior nostril not tubular (Fig. 10b); eye minute . . . . . ***Ichthyapus ophioneus***

21a. Supratemporal pores 5, preopercular pores usually 4 (occasionally 3); total vertebrae 123 to 132; preanal lateral-line pores 53 to 58 . . . . . ***Apterichtus ansp***

21b. Supratemporal pores 3, preopercular pores 3; total vertebrae 137 to 144; preanal lateral-line pores 61 to 65 . . . . . ***Apterichtus kendalli***



a) *Apterichtus* b) *Ichthyapus ophioneus*

Fig. 10 ventral view of snout and teeth on roof of mouth

22a. The only fin a short dorsal fin, originating midhead and ending 3 head lengths behind it; trunk extremely elongate; tail very short, about 30% of total length; pectoral fins absent . . . . . ***Phaenomonas longissima***

22b. Median fins continuous to near end of tail; trunk moderately to extremely elongate; tail 35% or more of total length; pectoral fins, if present, small and in upper gill opening corner . . . . . → ***23***

23a. Small, lappet-like pectoral fins present in upper gill opening corner (Fig. 9) . . . ***(Bascanichthys)*** → ***24***

23b. Pectoral fins absent . . . . . → ***26***

24a. A series of small, pale spots above each lateral-line pore along body, tail, and in branchial region (may be diffuse along body and tail of larger specimens); total vertebrae 159 to 167 . . . . . ***Bascanichthys scuticaris***

24b. No obvious pale spotting along lateral line or in branchial region; total vertebrae more than 177 . . . . . → ***25***

25a. Pectoral fins small, broad-based, their width 44 to 77% the length of gill opening; total vertebrae 177 to 190 . . . . . ***Bascanichthys bascanium***

25b. Pectoral fins minute, narrow-based, their width 36 to 37% the length of gill opening; total vertebrae 198 to 205 . . . . . ***Bascanichthys inopinatus***

26a. Anterior nostril a pore-like opening, without a raised rim (Fig. 11) . . . . . ***Caralophia loxochila***

26b. Anterior nostril tubular, either set off from underside of snout by a groove or notably within a tube . . . . . → ***27***

27a. Underside of snout not grooved; intermaxillary teeth inconspicuous . . . . . ***Ethadophis akkistikos***

27b. Underside of snout grooved nearly to base of anterior nostrils (Fig. 12); intermaxillary teeth protruding. . . . . ***(Gordiichthys)*** → ***28***

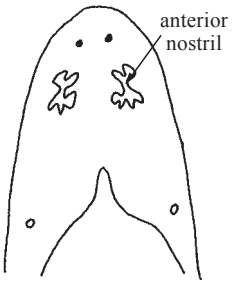


Fig. 11 underside of snout

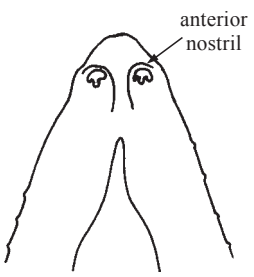


Fig. 12 underside of snout

28a. Anterior nostrils within a short tube that extends noticeably beneath underside of snout . . . . . ***Gordiichthys ergodes***

28b. Anterior nostrils not tubular, partly set off from underside of snout by a groove . . . . . → ***29***

29a. Body moderately elongate, its depth 62 to 79 times in total length; bicoloured in life and in preservative, dark dorsally and pale ventrally; vomerine teeth biserial anteriorly . . . . . ***Gordiichthys randalli***

29b. Body extremely elongate, worm-like, its depth 80 to 128 times in total length; coloration in preservative uniform, not darker dorsally; vomerine teeth uniserial throughout. . . . . → ***30***

30a. Body depth 80 to 91 times in total length; preanal vertebrae 92 to 98 and total vertebrae 168 to 176; lateral-line pores 161 to 166 . . . . . ***Gordiichthys leibyi***

30b. Body depth 100 to 128 times in total length; preanal vertebrae 105 to 111 and total vertebrae 193 to 206; lateral-line pores 186 to 189 . . . . . ***Gordiichthys irretitus***

31a. Anterior teeth of both jaws long, fang-like canines, extending far outside mouth when closed; lower jaw extends beyond snout (Fig. 13) . . . . . ***Aplatophis chauliodus***

31b. Anterior teeth in jaws not fangs extending beyond snout tip; snout extends beyond lower jaw, or jaws subequal. . . . . → ***32***

Fig. 13 lateral view of head (*Aplatophis chauliodus*)

32a. Teeth molariform or granular; pectoral fins broad-based (Fig. 14); dorsal-fin origin on head . . . . . ***(Myrichthys)*** → ***33***

32b. Teeth pointed; pectoral-fin base restricted, opposite upper half of gill openings (Fig. 15); dorsal-fin origin on or behind head . . . . . → ***34***

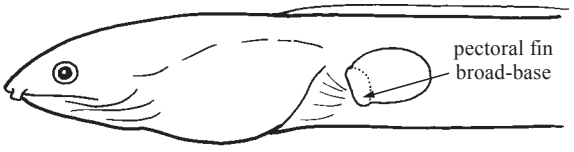


Fig. 14 lateral view of head (*Myrichthys*)

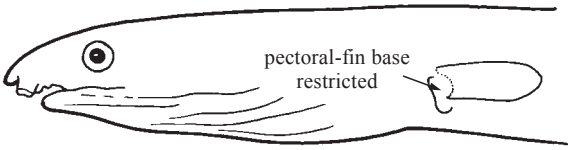


Fig. 15 lateral view of head

33a. Body coloration with round pale spots on dark background of brown or green . . . . . ***Myrichthys breviceps***

33b. Body coloration with diffuse dark spots with bright centres (gold in life) on a pale background . . . . . ***Myrichthys ocellatus***

34a. Pectoral fins rudimentary, much smaller than eye (Fig. 16); head and trunk slightly longer than tail . . . . . ***Quassiremus ascensionis***

34b. Pectoral fins developed, larger than eye; head and trunk as long as or shorter than tail . . . . . → ***35***

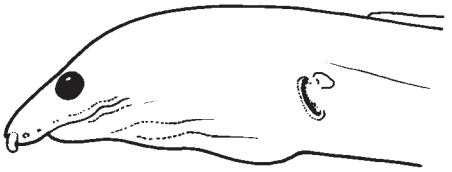


Fig. 16 lateral view of head (*Quassiremus ascensionis*)

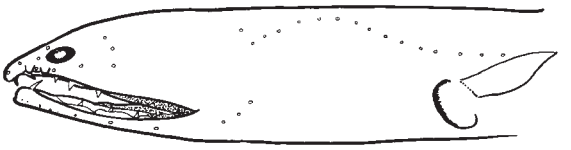


Fig. 17 lateral view of head (*Kertomichthys blastorhinus*)

35a. Eye before middle of upper jaw (Fig. 17); some teeth long and fang-like . . . . . → ***36***

35b. Eye over middle of upper jaw; teeth not long and fang-like . . . . . → ***39***

36a. Snout short, its profile depressed, narrow posteriorly and clavate anteriorly; vomerine teeth numerous and small, mostly uniserial . . . . . ***Kertomichthys blastorhinus***

36b. Snout longer and linear; vomerine teeth larger, either biserial or uniserial . . . . . → ***37***

37a. Maxillary teeth in 3 rows; vomerine teeth large and uniserial (Fig. 18a); preopercular pores absent; body coloration with fine brown speckling, lacking large spots . . . . ***Lethogoleos andersoni***

37b. Maxillary teeth in 1 or 2 rows; vomerine teeth small and biserial (Fig. 18b); at least 2 preopercular pores present, although may be difficult to observe; body coloration of dark spots as large or larger than eye . . . . . ***(Echiophis)*** → ***38***

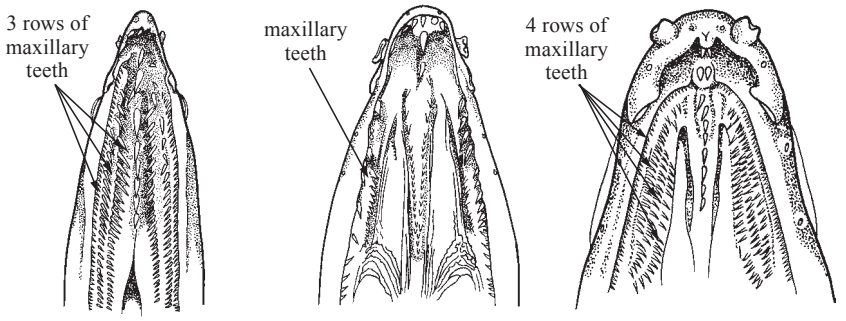


Fig. 18 teeth in upper jaw

38a. Body coloration with large brown spots on pale background; 2 inconspicuous preopercular pores; dorsal-fin origin behind pectoral-fin tips by length less than that of pectoral fins . . . . . ***Echiophis intertinctus***

38b. Body coloration with small brown spots on tan background; 3 preopercular pores set in dark spots; dorsal-fin origin behind pectoral-fin tips by greater than their length . . ***Echiophis punctifer***

39a. Teeth minute, conical, in 4 rows on maxillary (Fig. 18c); lateral line abruptly arched and abutting its partner in head region; body coloration uniform . . . . . ***Hyphalophis devius***

39b. Teeth generally not minute, in 3 rows or less on maxilla; lateral line not abruptly arched in head region; coloration various, either plain, spotted, banded or saddled . . . . . → ***40***

40a. Jaws subequal; snout tip blunt; labial barbels pendant, conspicuous (Fig. 19); coloration boldly spotted. . . ***Herpetoichthys regius***

40b. Snout overhanging lower jaw; snout tip rounded to pointed; barbels on upper lip present or absent, not pendant and conspicuous; coloration various, either plain, spotted, saddled or banded . . . . . ***(Ophichthus)*** → ***41***

Fig. 19 lateral view of head (*Herpetoichthys regius*)

41a. Anterior nostril with a tentacle from its inner rim (Fig. 20), longer than length of nostril tube (a small barbel along lip between anterior and posterior nostrils); coloration uniform, fins black-edged; teeth on jaws and vomer biserial . . . . . ***Ophichthus cylindroideus***

41b. Anterior nostril tubular, lacking an obvious tentacle from its inner rim. . . . . → ***42***

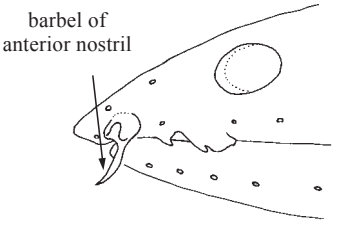


Fig. 20 lateral view of snout (*Ophichthus cylindroideus*)

42a. Tail 69% or more of total length; body elongate, not robust; pores of head and lateral line dark and conspicuous, in striking contrast to head and body . . . . . ***Ophichthus melanoporus***

42b. Tail 65% or less of total length; body moderately elongate to stout; pore coloration not as above. . . . . → ***43***

43a. Dorsal-fin origin well behind tips of pectoral fins. . . . . → ***44***

43b. Dorsal-fin origin above, slightly behind, or in advance of pectoral-fin tips . . . . . → ***47***

44a. Body dark (although median fins may be lighter), lacking bands or spots; teeth small, biserial to multiserial in jaws; vomerine teeth uniserial posteriorly. . . . . ***Ophichthus cruentifer***

44b. Body banded or spotted; teeth stout, upper jaw teeth biserial or multiserial; vomerine teeth uniserial or biserial . . . . . → ***45***

45a. Body with dark blotches along flank equal to or larger than eye; tail longer than 60% of total length. . . . . ***Ophichthus menezesi***

45b. Body without spots, but with 13 to 15 dark saddles; tail less than 60% of total length . . . . . → ***46***

46a. Dorsal-fin origin behind pectoral-fin tip by a distance greater than length of pectoral fin; vomerine teeth of adults uniserial; total vertebrae 144 to 147 . . . . . ***Ophichthus spinicauda***

46b. Dorsal-fin origin behind pectoral-fin tip by a distance less than length of pectoral fin; vomerine teeth of adults biserial to triserial; total vertebrae 115 to 119 . . . . . ***Ophichthus rex***

47a. Vomerine teeth biserial to triserial; tail longer than 60% of total length; body without dark bars, saddles, or light or dark spots . . . . . ***Ophichthus gomesii***

47b. Vomerine teeth uniserial (although sometimes a pair anteriorly); tail shorter than 60% of total length; body with dark bands or light or dark spots . . . . . → ***48***

48a. Body with brown saddles (although sometimes faint or lost in preservative); dorsal fin edged with brown . . . . . ***Ophichthus hyposagmatus***

48b. Body with dark or pale spots, lacking brown bands, bars or saddles; dorsal fin not notably edged with brown . . . . . → ***49***

49a. Body grey or bicoloured, dark dorsally, with pale eye-sized spots along midline; head pores within dark spots . . . . . ***Ophichthus puncticeps***

49b. Body pale, with irregular large dark blotches or with small dark spots outlining lateral-line and head pores . . . . . → ***50***

50a. Large dark spots and blotches along pale body, often meeting along the back; head, chin, and throat freckled with numerous small dark spots . . . . . ***Ophichthus ophis***

50b. Lateral-line pores and head pores set in small dark spots, sharply contrasting with pale body colour; dorsal fin with black edge . . . . . ***Ophichthus omorgmus***

List of species occurring in the area

Note: The following list probably represents the status of most of the shallow-water ophichthids known from the area. Because their cryptic and fossorial habits make them difficult to collect, it is likely that several undescribed species, particularly from deep water, exist. Included in the key, but not in this list, are 2 species (*Herpetoichthys regius* (Shaw, 1848) and *Phaenomonas longissima* (Cadenat and Marchal, 1963)) that are likely to be found in the area. The distributional abbreviation "C" indicates "central."

Ahlia egmontis (Jordan, 1884). To 43 cm. At 1 to 37 m depth WC 31.

Aplatophis chauliodus Böhlke, 1956. To 80 cm. At 33 to 91 m depth, NW31, SC31.

Aprognathodon platyventris Böhlke, 1967. To 45 cm. At 0 to 17 m depth, C31.

Apterichtus ansp (Böhlke, 1968). To 41 cm. At 0 to 15 m depth, C31, E31, WC41.
Apterichtus kendalli (Gilbert, 1891). To 54 cm. From 6 to 401 m depth, C31, E34.

Asarcenchelys longimanus McCosker, 1985. To 28 cm. S31.

Bascanichthys bascanium (Jordan, 1884). To 70 cm. At 0 to 24 m depth, W31.
Bascanichthys inopinatus McCosker, Böhlke and Böhlke, 1989. To 81 cm. At 40 m depth, C31.
Bascanichthys scuticaris (Goode and Bean, 1880). To ~1 m. at 0 to 27 m depth, W31.

Callechelys bilinearis Kanazawa, 1952. To 172 cm. At 0 to 22 m depth, N31, S31, N41, NC47.
Callechelys guineensis (Osorio, 1894). To 107 cm. At 0 to 36 m depth, C31, E34.
Callechelys muraena Jordan and Evermann, 1887. To 59 cm. At 27 to 115 m depth, W31, N31.
Callechelys springeri (Ginsburg, 1951). To 80 cm. At 22 to 36 m depth, NW31.

Caralophia loxochila Böhlke, 1955. To 46 cm. At 0 to 3 m depth, C31, SW31, WC41.

Echiophis intertinctus (Richardson, 1848). To 103 cm. At 20 to 64 m depth, NW31, SC31, WC 41.
Echiophis punctifer (Kaup, 1860). To 120 cm. To 100 m depth, NW31, SC31, WC 41.

Ethadophis akkistikos McCosker and Böhlke, 1984. To 32 cm. At 30 to 60 m depth, W31.

Gordiichthys ergodes McCosker, Böhlke and Böhlke, 1989. To 34 cm. At 30 to 60 m depth, W31.
Gordiichthys irretitus Jordan and Davis, 1891. To 79 cm. At 90 to 200 m depth, W31.
Gordiichthys leibyi McCosker and Böhlke, 1984. To 42 cm. At 37 to 72 m depth, NW31.
Gordiichthys randalli McCosker and Böhlke, 1984. To 67 cm. At 7 to 12 m depth, SC31.

Hyphalophis devius McCosker and Böhlke, 1982. To 29 cm. At 293 to 366 m depth, C31.

Ichthyapus ophioneus (Evermann and Marsh, 1900). To 48 cm. To 15 m depth, W31, WC41, W47.

Kertomichthys blastorhinus (Kanazawa, 1963). To 42 cm. At 183 m, SC31.

Letharchus velifer Goode and Bean, 1882. To 58 cm. At 5 to 90 m depth, NW31.

Lethogoleos andersoni McCosker and Böhlke, 1982. To 32 cm. At 141 to 192 m depth, C31, NC31.

Mixomyrophis pusillipinna McCosker, 1985. To 41 cm. At 393 to 451 m depth, NC31.

Myrichthys breviceps (Richardson, 1848). To 78 cm. At 0 to 9 m depth, C31, NC31, NW.
Myrichthys ocellatus (Lesueur, 1825). To 108 cm. At 0 to 7 m depth, C31, NC31, NW 41.

Myrophis anterodorsalis McCosker, Böhlke and Böhlke, 1989. To 16 cm. At 0 to 1.3 m depth, SC31.
Myrophis platyrhynchus Breder, 1927. To 21 cm. At 0 to 10 m depth, C31, C41.
Myrophis plumbeus (Cope, 1871). To 47 cm. S31, N41, E34.
Myrophis punctatus Lütken, 1851. To 35 cm. At 0 to 7 m depth, SC31, C41.

Ophichthus cruentifer (Goode and Bean, 1896). To 47 cm. At 36 to 1350 m depth, SC31, NW31, SW21.
Ophichthus cylindroideus (Ranzani, 1840). To 93 cm. At 24 to 46 m depth, SW31, NW41.
Ophichthus gomesii (Castelnau, 1855). To 66 cm. To 90 m depth, NC31, SW31, NW41.
Ophichthus hyposagmatus McCosker and Böhlke, 1984. To 39 cm. At 88 to 293 m depth, SW31, SC31.
Ophichthus melanoporus Kanazawa, 1963. To 69 cm. At 51 to 460 m depth, NW31.
Ophichthus menezesi McCosker and Böhlke, 1984. To 28 cm. At 169 to 1 400 m depth, NW31, W41.
Ophichthus omorgmus McCosker and Böhlke, 1984. To 45 cm. At 183 to 271 m depth, W31.
Ophichthus ophis (Linnaeus, 1758). To ~2 m. At 10 to 50 m depth, C31, SE34, NW41.
Ophichthus puncticeps (Kaup, 1860). To 93 cm. At 20 to 200 m depth, NW31, SC31.
Ophichthus rex Böhlke and Caruso, 1980. To 180 cm. At 22 to 366 m depth, NW31, W31.
Ophichthus spinicauda (Norman, 1922). To 108 cm. At 110 to 310 m depth, C31, SC31.

Pseudomyrophis frio (Jordan and Davis, 1891). To 31 cm. At 100 to 420 m depth, S31, W41.
Pseudomyrophis fugesae McCosker, Böhlke and Böhlke, 1989. To 95 mm. From 56 to 119 m depth, W31, N41.
Pseudomyrophis nimius Böhlke, 1960. To 37 cm. At 320 to 755 m depth, NW31.

Quassiremus ascensionis (Studer, 1889). To 70 cm. At 0 to 12 m depth, NC31, C31, NW41.

Stictorhinus potamius Böhlke and McCosker, 1975. To 35 cm. At 0 to 20 m depth, SC31, WC31, NW47.

References

Böhlke, J.E. 1977. Ophichthidae. In *FAO Species Identification Sheets Western Central Atlantic (Fishing Area 31)*, edited by W. Fischer. Rome, FAO (unpaginated).

Leiby, M.M. 1989. Family Ophichthidae. In Fishes of the Western North Atlantic, Part 9. Leptocephali. *Sears Found. Mar. Res*., 2:764-897.

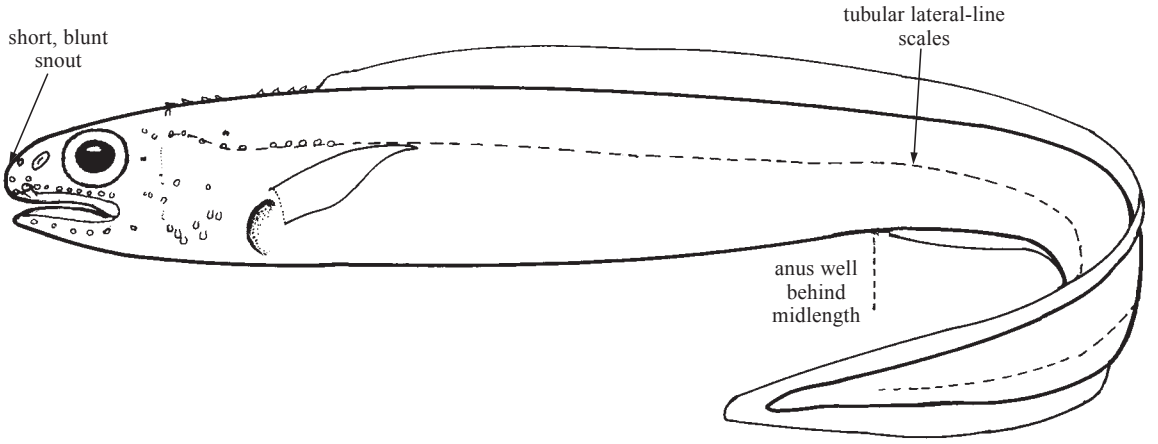
McCosker, J.E., E.B. Böhlke, and J.E. Böhlke. 1989. Family Ophichthidae. In Fishes of the Western North Atlantic, Part 9. Orders Anguilliformes and Saccopharyngiformes. *Sears Found. Mar. Res*., 1:254-412.

COLOCONGRIDAE

Short-tailed eels

by D.G. Smith, National Museum of Natural History, Washington, D.C., USA

Diagnostic characters: Small to medium-sized eels, maximum size 50 to 60 cm. **Body short and stubby, deepest shortly behind head, tapering toward tail, strongly compressed posteriorly; tail much shorter than body, anus well behind midlength**. Head wide and deep. Eye large, its diameter equal to or greater than snout length. **Snout short and bluntly rounded**, projecting slightly beyond lower jaw; anterior nostril a short tube near tip of snout; posterior nostril large, round, with a low, raised rim, at mideye level. Mouth moderate, gape ending under rear of eye; no fleshy flanges on lips. Teeth small, conical, in 1 to 3 rows on jaws; intermaxillary teeth in 2 transverse series, posterior series continuous with maxillary teeth, anterior series separated and often incomplete; no teeth on vomer. **Dorsal and anal fins well developed, confluent with caudal fin; dorsal fin beginning slightly behind base of pectoral fin; pectoral fin well developed**. Scales absent. Lateral line complete, **pores in low tubes; head pores numerous, and except for anteriormost few are tubular**. Small dermal papillae on head. **Colour:** brown or grey, without markings. Sensory pores and papillae often black.



Habitat, biology, and fisheries: Colocongrids live on the mid- to upper continental slope in all tropical and subtropical oceans, except the eastern and central Pacific. They favour open terrain over muddy bottoms in depths of approximately 300 to 1 000 m. Little or nothing is known about their biology. Although they can be fairly common in their depth range and are sometimes taken in trawls, they are of no commercial importance.

Remarks: The Colocongridae contains a single genus, *Coloconger*, with 5 nominal species worldwide. One species occurs in the western Atlantic, another in the eastern Atlantic, and 3 in the Indo-West Pacific.

Similar families occurring in the area

These stubby, short-tailed eels are difficult to confuse with anything else. *Simenchelys parasitica* (Synaphobranchidae) also has a short, blunt snout, but it has embedded scales and its anus is near midlength; its mouth is much smaller, and it lacks tubular lateral-line pores. Some congrids, especially *Parabathymyrus*, have short snouts, but they have well developed flanges on the lips, and the anus is slightly before midlength.

List of species occurring in the area:

Coloconger meadi Kanazawa, 1957. To 50 to 60 cm. Florida to the Guianas, including the Gulf of Mexico.

Reference

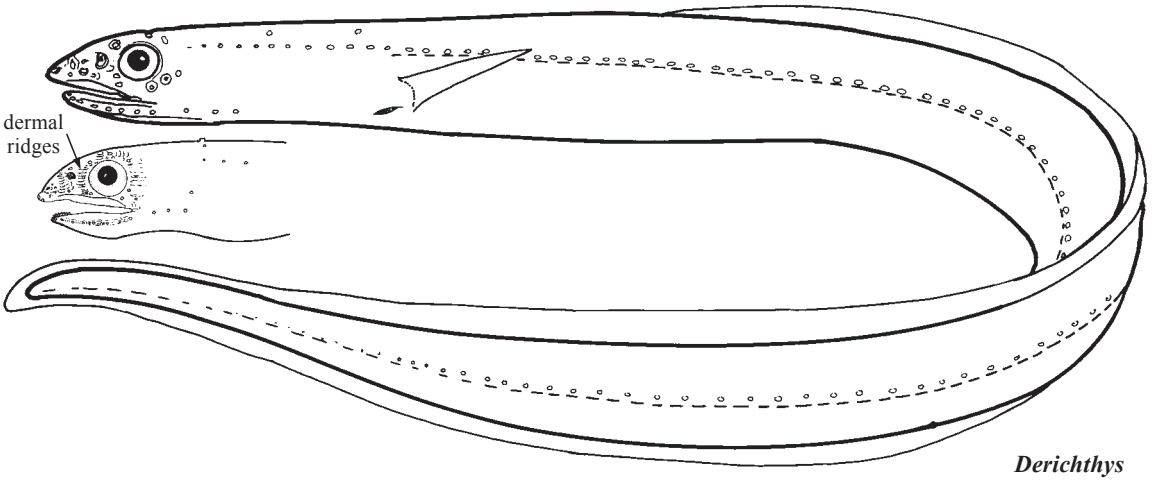
Smith, D.G. 1989. Family Colocongridae. In Fishes of the Western North Atlantic, edited by E. B. Böhlke. *Mem. Sears Found. Mar. Res.*, 1(9):413-419.

DERICHTHYIDAE

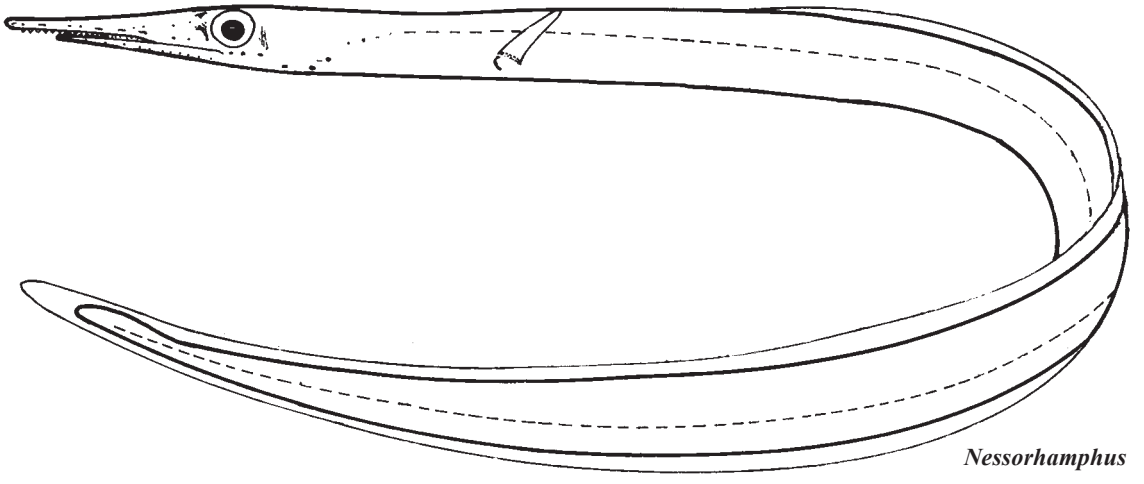
Longneck eels

by D.G. Smith, National Museum of Natural History, Washington, D.C., USA

Diagnostic characters: Small to medium-sized eels, maximum size approximately 60 cm, usually smaller. Body moderately elongate, tail not filamentous, ending in a small caudal fin; anus at or slightly behind midlength. Head variable in form, snout either short or markedly elongate. Eye well developed. Upper jaw extends beyond lower, cleft of mouth ends under or slightly behind eye; lips without upturned or downturned flanges. Teeth small, conical, multiserial. Gill opening small, slit-like, located just in front of and below pectoral fin. Dorsal and anal fins confluent with caudal fin; dorsal fin begins in anterior third of body, slightly behind tip of appressed pectoral fin; anal fin begins immediately behind anus, at or slightly behind midbody; **dorsal and anal fins both become distinctly reduced near end of tail**; pectoral fins present. Scales absent. Lateral line complete, pore system on head well developed. **Colour:** brown, with paler fins; 1 species with a dark midventral streak; no spots, lines, or other distinct markings.



Derichthys



Nessorhamphus

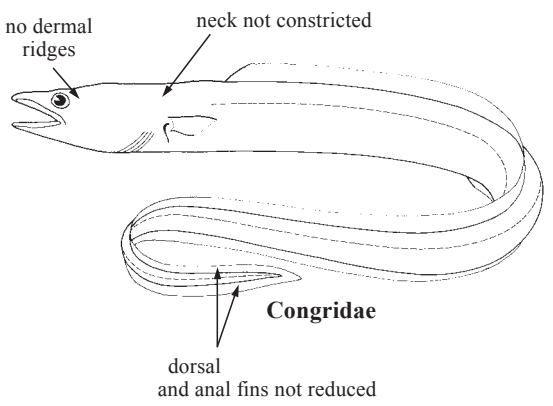
Habitat, biology, and fisheries: Derichthyids are midwater eels inhabiting depths of several hundred metres in all tropical and subtropical oceans. Little is known of their biology. They are seldom seen and are of no importance to fisheries.

Remarks: The Derichthyidae includes 2 genera and 3 species of small, seldom-seen, midwater eels. ***Derichthys*** **has a short snout, a constricted neck, and a series of short, longitudinal dermal ridges on the head** (presumably sensory in nature). ***Nessorhamphus*** **has a long, somewhat flattened snout, with the posterior nostril located far forward**; it lacks dermal ridges, and its neck is not constricted. Derichthyids are without the strong morphological specializations of the other midwater eels (the Nemichthyidae, Serrivomeridae, and Saccopharyngiformes).

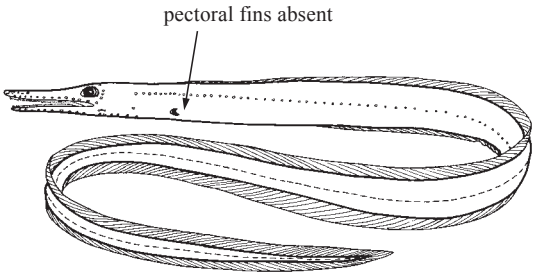
Similar families occurring in the area

Congridae: *Derichthys* is most likely to be confused with members of the Congridae, although the latter are not midwater eels and and are unlikely to be collected with it. *Derichthys* may be readily distinguished by the constricted neck, the short, longitudinal dermal ridges on the head, and the dorsal and and anal fins reduced near the end of the tail. Congrids do not have a constricted neck, lack ridges on the head, and the dorsal and anal fins are not reduced near the end of the tail.

Nettastomatidae: *Nessorhamphus* is most likely to be confused with certain members of the Nettastomatidae. All nettastomatids lack pectoral fins, however, except *Hoplunnis*, which is distinguished by the enlarged, fang-like teeth on the vomer. The posterior nostril in nettastomatids is highly variable in position, but it is never located nearer to the anterior nostril than to the eye.



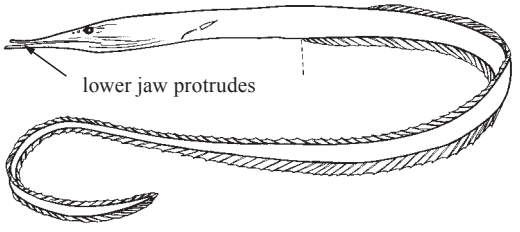
Congridae



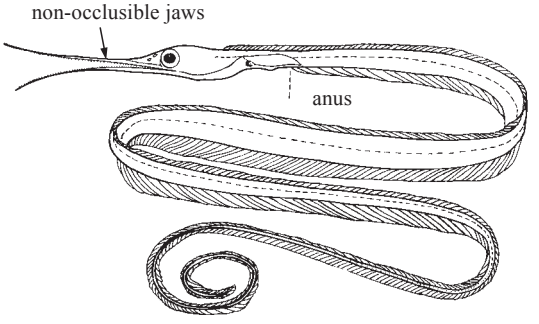
Nettastomatidae

Serrivomeridae: jaws equal or lower jaw protrudes; snout not spatulate; both nostrils near eye.

Nemichthyidae: jaws elongate and non-occlusible except in mature males; anus under or shortly behind pectoral fin.



Serrivomeridae



Nemichthyidae

Key to the genera and species of Derichthyidae occurring in the area

1a. Snout and lower jaw short, snout approximately equal to eye diameter; tip of snout not produced and spatulate, extends beyond lower jaw by a distance less than eye diameter (Fig. 1) . . . . . ***Derichthys serpentinus***

1b. Snout and lower jaw long, 3 to 6 times eye diameter; tip of snout produced and spatulate, extends beyond lower jaw by a distance equal to or greater than eye diameter (Fig. 2) . . . . . → ***2***

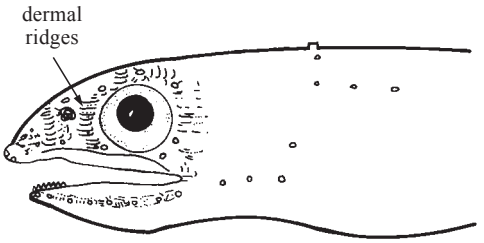


Fig. 1 ***Derichthys serpentinus***

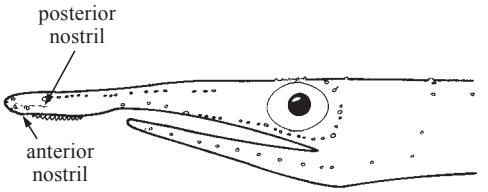


Fig 2 ***Nessorhamphus***

2a. Snout shorter, 3 to 4 times pigmented eye diameter; a dark streak running along midventral line (Fig. 3) . . . . . ***Nessorhamphus danae***

2b. Snout longer, about 6 times pigmented eye diameter; midventral line without a dark streak (Fig. 4) . . . . . ***Nessorhamphus ingolfianus***

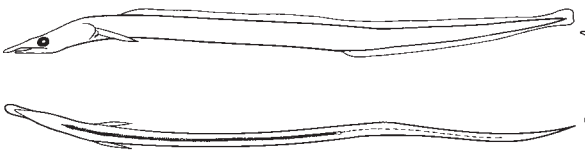


Fig. 3

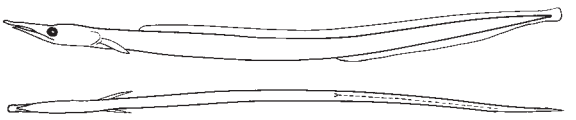


Fig. 4

List of species occurring in the area

Derichthys serpentinus Gill, 1864. To 35 cm. Worldwide.

Nessorhamphus danae Schmidt, 1931. To at least 29 cm. Equatorial Atlantic and Indo-Pacific.

Nessorhamphus ingolfianus (Schmidt, 1912). To 60 cm. Worldwide but antitropical; not known from Gulf of Mexico or Caribbean.

Reference

Robins, C.H. 1989. Family Derichthyidae. In Fishes of the Western North Atlantic. *Mem. Sears Found. Mar. Res.*, 1(9):420-431.

MURAENESOCIDAE

Pike congers

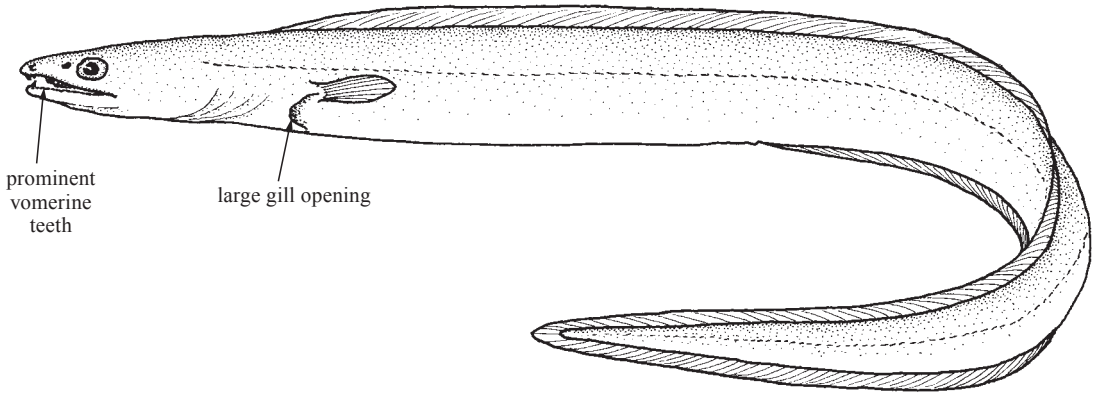
by D.G. Smith, National Museum of Natural History, Washington, D.C., USA

A single species occurring in the area.

Cynoponticus savanna (Bancroft, 1831) GPC

Frequent synonyms / misidentifications: *Muraenesox savanna* (Bancroft, 1831) / None.

FAO common names: En - Guayana pike-conger; **Fr** - Morénésoce coungré; **Sp** - Morenocio guayanés.



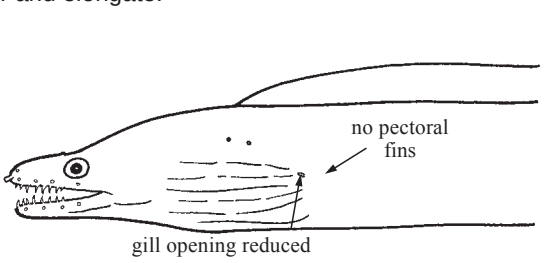
Diagnostic characters: Body moderately elongate, more or less cylindrical in front, compressed along tail. Head moderate. **Eye well developed**. Snout moderate, projects somewhat beyond tip of lower jaw. Anterior nostril tubular, on side of snout just behind tip; posterior nostril a simple opening in front of eye at approximately mideye level. Mouth large, gape ends just behind posterior margin of eye; lips without fleshy flanges. **Teeth large, prominent, sharp; multiserial on jaws; typically in 3 rows on vomer, with a median row of enlarged, compressed canines flanked on each side by a row of much smaller teeth; tip of lower jaw with its enlarged teeth fits into a notch in underside of snout when mouth closed; teeth concealed when mouth closed**. Gill opening a large, oblique slit in front of and below pectoral fin; **gill openings of the 2 sides nearly meet on ventral midline, interspace much smaller than length of gill opening**. Dorsal and anal fins well developed, confluent around tail; dorsal fin begins over or slightly ahead of pectoral-fin base. Pectoral fins well developed. Scales absent. **Lateral line complete, but opening through a complex or branching system of multiple pores rather than a single pore per segment; pores on head not apparent**. **Colour:** dark grey-black above, lighter below; pectoral fin black; dorsal and anal fins with a narrow, black edge.

Similar families occurring in the area

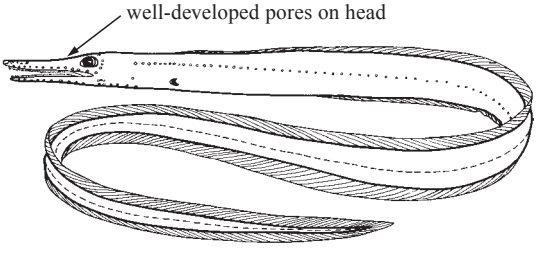
Few other eels have such greatly enlarged fangs on the roof of the mouth. Those that do are distinguished as follows:

Muraenidae: pectoral fins absent; gill opening reduced to a small pore; discrete pores on head.

Nettastomatidae (*Hoplunnis*): well-developed pores on head; vomerine fangs conical rather than compressed; lips reduced, maxillary and mandibular teeth exposed when mouth closed; body and head more slender and elongate.



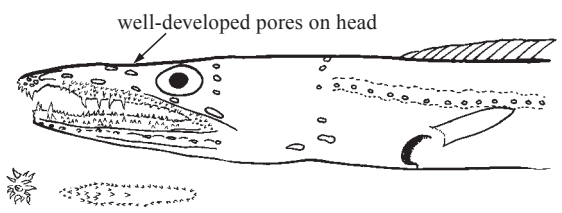
Muraenidae



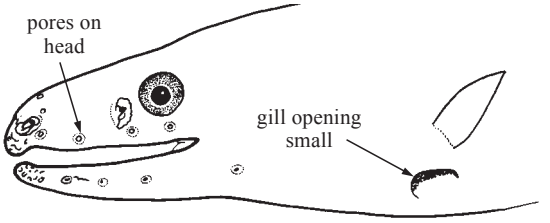
Nettastomatidae

Congridae: *Xenomystax* has some enlarged vomerine teeth, but none as massive and compressed as those of *Cynoponticus*; in addition, *Xenomystax* has well-developed pores on head, and teeth exposed when mouth closed. Other congrid species may resemble *Cynoponticus* superficially, but none has such enlarged vomerine fangs.

Synaphobranchidae (Ilyophinae): gill opening small, less than interbranchial space; pectoral fin small, less than snout length (greater than snout length in *Cynoponticus savanna*); pores on head.



Congridae

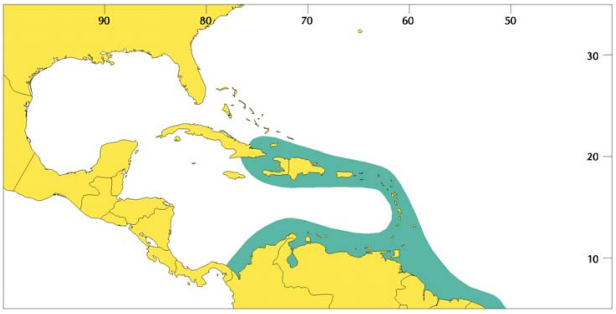


Synaphobranchidae

Size: Maximum size 200 cm, common to 50 cm.

Habitat, biology, and fisheries: Little information is available on the biology of this species. It lives on soft bottoms on continental and insular shelf, generally in less than 100 m depth, feeding on benthic invertebrates and fishes. Taken on bottom longlines and handlines at night, also in trawls, marketed mostly fresh. Separate statistics are not reported.

Distribution: Caribbean islands and coast of Central and South America to southern Brazil.



Reference

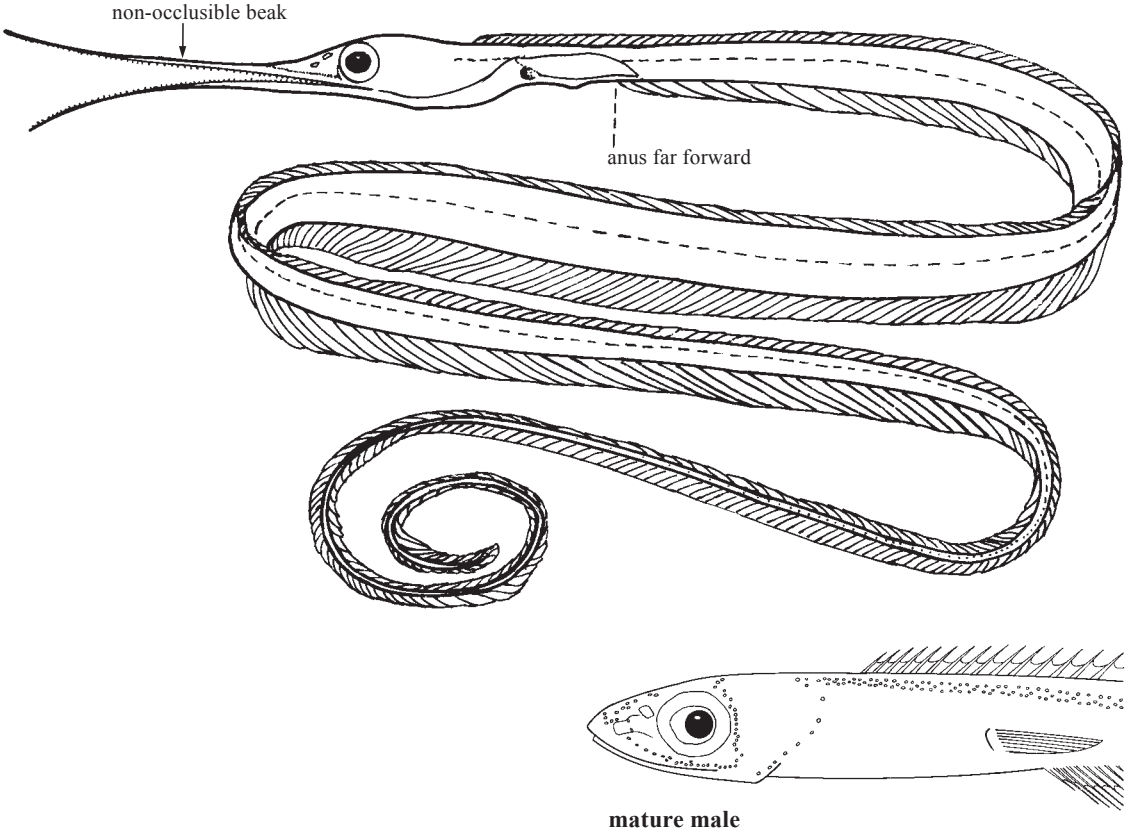
Smith, D.G. 1989. Family Muraenesocidae. In Fishes of the Western North Atlantic, edited by E. B. Böhlke. *Mem. Sears Found. Mar. Res.*, 1(9):432-440.

NEMICHTHYIDAE

Snipe eels

by D.G. Smith, National Museum of Natural History, Washington, D.C., USA

Diagnostic characters: Maximum size approximately 1 m, but much of this consists of the attenuated caudal region. **Body elongate to very elongate**, moderately to strongly compressed; tail moderately attenuate with a small caudal fin, or greatly attenuate and filiform; **anus far forward, either under pectoral fin or less than 1 head length behind it**. Eye well developed. **Jaws and snout produced into a long, non-occlusible beak in females and immatures**, short in mature males; cleft of mouth ends under or slightly behind eye. Teeth small with recurved tips, close-set in diagonal rows. Anterior and posterior nostrils located on side of head, just in front of eye; anterior nostril without a tube in females and immatures, strongly tubular and forwardly directed in mature males. Gill opening crescentic, located in front of and below pectoral fin. Dorsal and anal fins long and confluent with caudal fin when latter is present, **anal fin higher than dorsal fin; dorsal fin begins over or slightly in front of pectoral fin; anal fin begins just behind anus; pectoral fin present**. Scales absent. Lateral line complete, either as a single row of pores or 3 parallel rows of pores; pores on head well developed. **Colour:** variable, may be uniform dark or light brown, reverse countershaded (dark below and light above), completely pale, with or without internal dark bars, and with or without a patch of dark pigment spots below stomach.



mature male

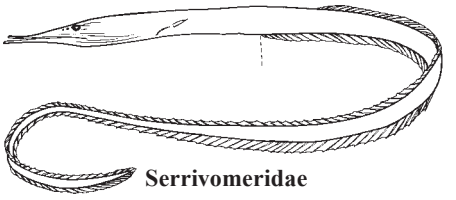
Habitat, biology, and fisheries: Nemichthyids live in the midwaters of the world's oceans; adults are found at depths of several hundred to more than 2 000 m. They appear to feed mainly on shrimps and are capable of eating relatively large prey. Mature males lose the characteristic elongated beak along with most of the teeth; the olfactory organs enlarge, and the anterior nostrils become tubular. These degenerative changes suggest that the eels die after spawning. Snipe eels are seldom seen and are of no importance to fisheries.

Similar families occurring in the area

Cyematidae: have jaws produced into a similar non-occlusible beak, but they have a short, stubby body and small eyes.

Serrivomeridae: have prolonged jaws that are fully occlusible; dorsal fin begins over or behind the anus; in nemichthyids, dorsal fin always begins in front of anus; anus located well behind the head, at about the first third or first quarter of total length.

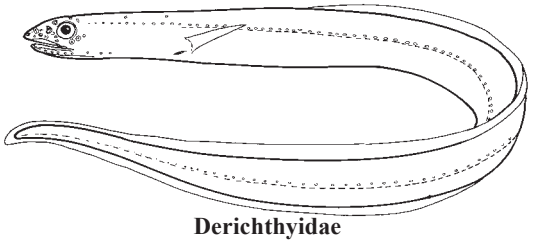
Cyematidae



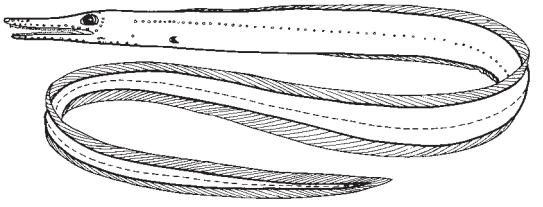
Serrivomeridae

Derichthyidae: jaws are occlusible, dorsal fin begins behind the pectoral fin, and anus is located far behind pectoral fin, near midbody.

Nettastomatidae: have long jaws that are fully occlusible; anus is located well behind pectoral fin.



Derichthyidae



Nettastomatidae

Key to the species of Nemichthyidae occurring in the area

1a. Caudal region extremely elongated and thread-like (Fig. 1), a distinct caudal fin absent; 3 rows of pores in lateral line (Fig. 2); no dermal ridges on head . . . . . → *2*

1b. Caudal region not thread-like (Fig. 3), a small caudal fin present; 1 row of pores in lateral line (Fig. 4); small, longitudinal dermal ridges on head (Fig. 5) . . . . . → *3*

Fig. 1 caudal region

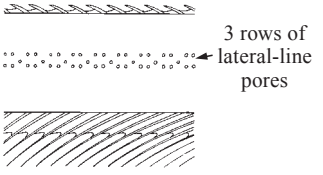


Fig. 2 lateral view of body

Fig. 3 caudal region

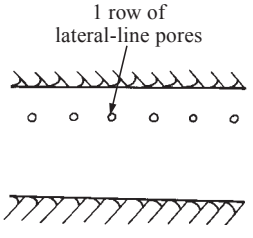


Fig. 4 lateral view of body

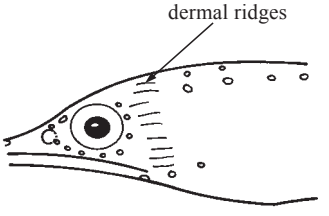


Fig. 5 lateral view of head

2a. Body dark brown or countershaded (Fig. 6); postorbital pores 6 to 17, usually more than 10, arranged in a staggered row; preopercular pores 6 to 13 . . . . . ***Nemichthys scolopaceus***

2b. Body pale with a cluster of black spots below stomach and dark subcutaneous vertical bars between vertebrae (Fig. 7); postorbital pores 5 to 14, usually fewer than 10, arranged in an even row; preopercular pores 2 to 6 . . . . . ***Nemichthys curvirostris***

Fig. 6 ***Nemichthys scolopaceus***

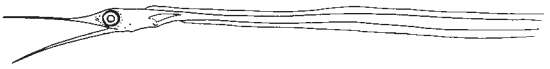


Fig. 7 ***Nemichthys curvirostris***

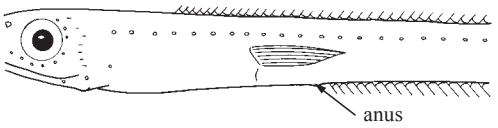


Fig. 8 lateral view of anterior body (*L. carinatus*)

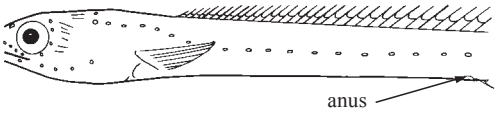


Fig. 9 lateral view of anterior body (*A. infans*)

3a. Anus located under pectoral fin (Fig. 8) . . . . . ***Labichthys carinatus***

3b. Anus located behind pectoral fin (Fig. 9) . . . . . ***Avocettina infans***

List of species occurring in the area

Avocettina infans (Günther, 1878). To about 80 cm. Worldwide, mostly N hemisphere.

Labichthys carinatus Gill and Ryder, 1883. To about 80 cm. E and W Atlantic, Indian Ocean, and central Pacific.

Nemichthys curvirostris (Strömman, 1896). To 1 m or more. E and W Atlantic, including Gulf of Mexico but not Caribbean; also Indian Ocean and S Pacific.

Nemichthys scolopaceus Richardson, 1848. To 1 m or more. Worldwide from about 55° N to 45° S.

Reference

Smith, D.G. and J.G. Nielsen. 1989. Family Nemichthyidae. In Fishes of the Western North Atlantic, edited by E.B.Böhlke. *Mem. Sears Found. Mar. Res.*, 1(9):441-459.

CONGRIDAE

Conger eels

by D.G. Smith, National Museum of Natural History, Washington, D.C., USA

Diagnostic characters: Medium-sized to large eels, most growing to 0.5 m, a few species to 2 m total length. Body moderately elongate to extremely elongate, round in cross-section anteriorly, compressed posteriorly; anus usually located at anterior 1/2 to 1/3 of total length; tail variable, from blunt and stiffened to long and slender. **Eye well developed, sometimes very large**. Snout variable, from long and pointed to short and pug-nosed; tip of snout usually extends at least slightly beyond tip of lower jaw, except in Heterocongrinae, where lower jaw protrudes. Anterior nostril tubular, near tip of snout; **posterior nostril usually located on side of head in front of eye**. Mouth variable, gape usually ending at some point beneath eye; in most species tip of lower jaw fits into space behind intermaxillary tooth patch; flanges on upper and lower lip present or absent. Teeth variable, from small and granular to long and fang-like; in many species, intermaxillary teeth exposed when mouth closed. Branchiostegal rays long but not overlapping ventrally, moderate in number, usually about 8 to 12. Gill opening a crescentic slit, just in front of pectoral fin. **Dorsal and anal fins always present, confluent around tail**; dorsal fin begins over or slightly behind pectoral fin, always closer to pectoral fin than to anus; caudal fin sometimes reduced, but some rays almost always present; pectoral fin usually present, well developed in most species, but reduced or absent in heterocongrines. Scales absent. Lateral line complete. **Colour:** most species plain brown or grey, pale ventrally, vertical fins often edged in black.

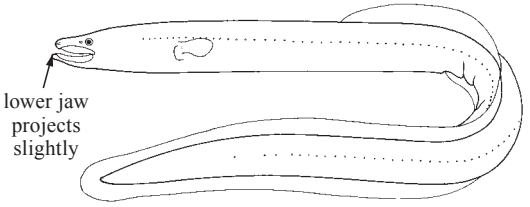
Habitat, biology, and fisheries: Congers are medium-sized to large eels found in tropical to temperate seas worldwide; a few species can reach 2 to 3 m in total length, but most are much smaller. They occur primarily on sand or mud bottoms from the coastline to depths of 2 000 m or more; most species live on the shelf or slope. Many burrow during the day and actively forage at night. The Heterocongrinae are the most distinct of the congrids, and among the few that show conspicuous morphological specializations. These are the so-called garden eels, which live in burrows in coral sand and project the front portion of the body from the burrow to feed on zooplankton. The remainder of the family are bottom dwellers that feed on a variety of fishes and invertebrates. Some species of *Conger* and a few *Ariosoma* are found in the commercial fishery, but on the whole they are of little importance and separate statistics are not available. They are caught by trawls, traps, and by hook-and-line, and are marketed mostly fresh. Because of their diversity and abundance, congrids probably play a more important role in the ecology of the area than their relatively minor position in the fishery would indicate.

Remarks: The genus *Coloconger* has in the past been included in the Congridae. It is here considered to represent a distinct family and is treated under the Colocongridae. The genus *Xenomystax* has been placed in the Muraenesocidae but is here considered to be a congrid.

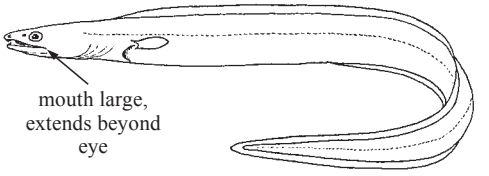
Similar families occurring in the area

Anguillidae: body covered with tiny embedded scales (scaleless in Congridae); lower jaw projecting slightly; dorsal fin begins about midway between pectoral fins and anus or over anus (always above or before pectoral tips in Congridae).

Muraenesocidae: mouth very large, extending to beyond eye (mouth in Congridae barely reaches rear margin of eye); vomerine teeth prominant, fang-like (relatively small in Congridae); gill openings nearly meet each other across ventral midline.



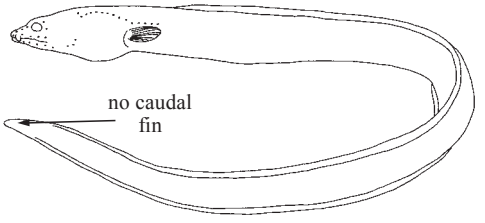
Anguillidae



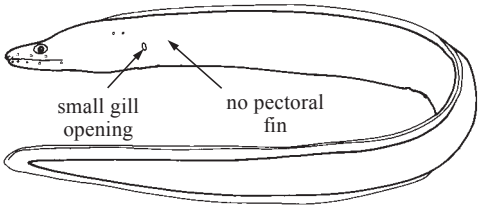
Muraenesocidae

Ophichthidae: in most genera no caudal fin but tip a hard, burrowing point (caudal fin present in most Congridae); posterior nostril usually inside mouth or in some way penetrating upper lip (a simple aperture in Congridae); throat swollen, supported by many branchiostegal rays overlapping in midline; a median frontal pore on head (no such pore in Congridae, although there is a median supratemporal pore).

Muraenidae: no pectoral fins (always present in Congridae); gill opening a small hole (a vertical slit in Congridae); teeth fang-like or molar-like (small and conical in Congridae); typically brightly banded, spotted or mottled.

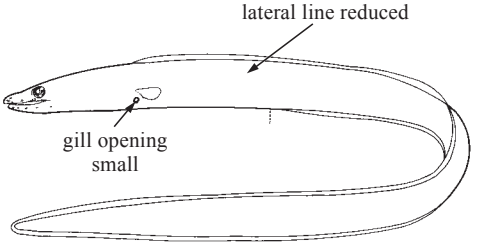


Ophichthidae



Muraenidae

Chlopsidae: gill opening a small hole; vomerine teeth in 2 divergent rows (a single or several parallel rows in Congridae); lateral line system reduced (prominent in Congridae); posterior nostril low on snout or flap-like; pectoral fins present or absent.



Chlopsidae

Key to the species of Congridae occurring in the area

Note: In some congrids the tip of the tail is frequently lost through injury. This can affect proportional measurements and give unnaturally high values for any proportion based on total length. The key below assumes that the specimen is intact.

1a. Body extremely elongate; mouth very oblique; snout length very short, much less than diameter of eye, anterior nostril enclosed in flange of upper lip (Fig. 1); pectoral fin reduced; caudal fin reduced or absent externally . . . . . **(Heterocongrinae)** → *2*

1b. Body moderately elongate; mouth horizontal or slightly oblique; snout length only slightly less than, to somewhat greater than diameter of eye; anterior nostrils free; pectoral fin well developed; caudal fin present though sometimes reduced . . . . . → *3*

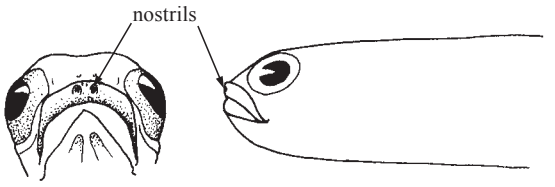


Fig. 1 anterior and lateral view of head

2a. Brown anteriorly, grading into pale yellow posteriorly; vertebrae 158 to 168; Caribbean and Bahamas . . . . . ***Heteroconger longissimus***

2b. Yellow anteriorly; vertebrae 139 to 148; Gulf of Mexico and east coast of Florida . . . . . ***Heteroconger luteolus***

3a. Preanal length usually greater than 40% total length; caudal fin short and tip of tail stiff; posterior nostril below mideye level; dorsal- and anal-fin rays unsegmented; flange present on upper lip . . . . . **(Bathymyrinae)** → *4*

3b. Preanal length usually less than 40% total length; posterior nostril at or above mideye level; dorsal- and anal-fin rays segmented; flange on upper lip present or absent . . . . **(Congrinae)** → *10*

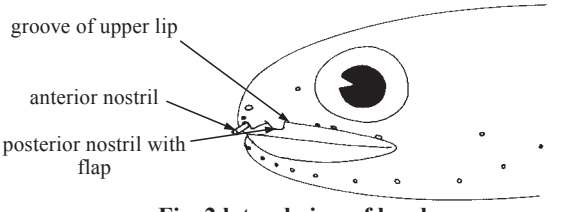


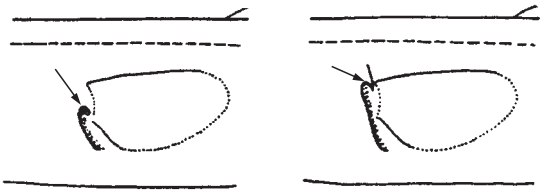
Fig. 2 lateral view of head

4a. Posterior nostril covered by a flap (Fig. 2) . . . . ***Parabathymyrus oregoni***

4b. Posterior nostril exposed . . . . . → *5*

5a. Upper end of gill opening at middle of pectoral-fin base (Fig. 3a); jaw teeth in bands . . . . . → *6*

5b. Upper end of gill opening at or above upper end of pectoral-fin base (Fig. 3b); jaw teeth in 1 or 2 series, forming a cutting edge . . . . . → *9*



a) ***Ariosoma*** **b)** ***Paraconger***

Fig. 3 gill opening

6a. Three supratemporal pores; interorbital pores present (Fig. 4); 3 postorbital pores . . . . . ***Ariosoma balearicum***

6b. Supratemporal and interorbital pores absent; 0 to 2 postorbital pores . . . . . → *7*

7a. Two postorbital pores; distance between upper and lower end of each gill opening greater than distance between the right and left gill openings, measured across isthmus . . . . . ***Ariosoma selenops***

7b. Postorbital pores absent; distance between upper and lower end of each gill opening less than distance between the right and left gill openings, measured across isthmus . . . . . → *8*

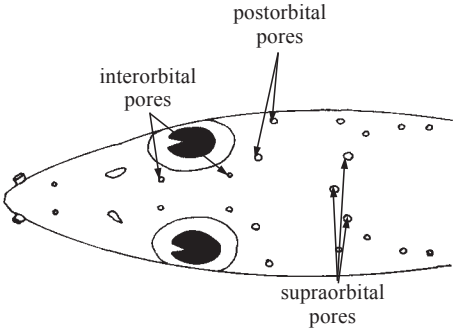


Fig. 4 dorsal view of head

8a. Preanal length 43 to 45% total length; preanal lateral-line pores 47 to 53 . . . . . ***Ariosoma coquettei***

8b. Preanal length 49 to 52% total length; preanal lateral-line pores 55 to 59 . . . . . ***Ariosoma anale***

9a. Preanal lateral-line pores 40 to 43; postorbital pores present; Caribbean, Bahamas, and Gulf of Mexico . . . . . ***Paraconger caudilimbatus***

9b. Preanal lateral-line pores 31 to 36; postorbital pores absent; Guianas and Brazil . . . . . ***Paraconger guianensis***

10a. Inner row of maxillary and mandibular teeth separated from outer rows by an edentulous groove, maxillary and mandibular teeth exposed when mouth closed (Fig. 5) . . . . → *11*

10b. Inner row of maxillary and mandibular teeth not separated from outer rows by an edentulous groove; maxillary and mandibular teeth concealed when mouth closed . . . . . → *13*

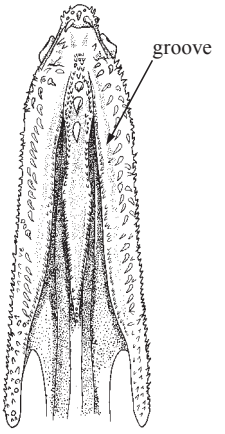


Fig. 5 ventral view of snout and roof of mouth

11a. Posterior nostril between 1/2 and 1 eye diameter or 2 nostril diameters in front of anterior margin of eye . . . . . ***Xenomystax austrinus***

11b. Posterior nostril less than 1/2 eye diameter or 1 nostril diameter in front of anterior margin of eye . . . . . → *12*

12a. Intermaxillary tooth patch longer than broad; dorsal fin begins over or slightly behind base of pectoral fin; stomach and intestine pale . . . . . ***Xenomystax bidentatus***

12b. Intermaxillary tooth patch as broad as long; dorsal fin begins before base of pectoral fin; stomach and intestine black . . . . . ***Xenomystax congroides***

13a. Maxillary and mandibular teeth in 1 or 2 rows, the outer row forming a cutting edge; upper labial flange well developed (Fig. 6) . . . . . → *14*

13b. Maxillary and mandibular teeth in bands or in 2 rows, not forming a cutting edge; upper labial flange reduced or absent . . . . . → *16*

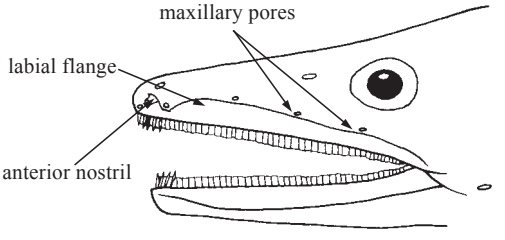


Fig. 6 lateral view of head

14a. Three supratemporal pores; 1 ro 2 postorbital pores; Caribbean, Bahamas, Bermuda . . . . . ***Conger triporiceps***

14b. One supratemporal pore; no postorbital pores . . . . . → ***15***

15a. Preanal lateral-line pores 32 to 36; vertebrae 132 to 137; Caribbean and Bermuda . . . . . ***Conger esculentus***

15b. Preanal lateral-line pores 37 to 44; vertebrae 143 to 147; mainland North America . ***Conger oceanicus***

16a. Tip of tail slightly stiffened and caudal fin somewhat reduced; a narrow upper labial flange present . . . . . → ***17***

16b. Tip of tail soft and flexible, caudal fin not reduced; upper labial flange rudimentary or absent . . . . . → ***19***

17a. Second and approximately seventh to thirteenth lateral-line pores elevated, opening from dorsal side of canal (Fig. 7); stomach black . . . . . ***Gnathophis bathytopos***

17b. Only second and at most 1 other lateral-line pore elevated; stomach pale . . . . → ***18***

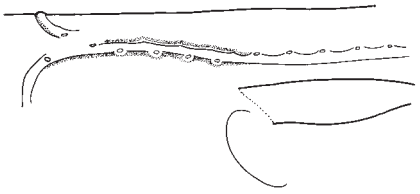


Fig. 7 lateral line pores

18a. Three postorbital pores; 26 to 31 preanal lateral-line pores . . . . . ***Gnathophis bracheatopos***

18b. Two postorbital pores; 34 to 36 preanal lateral-line pores . . . . . ***Gnathophis tritos***

19a. Vomerine teeth in a single row, reaching level of posterior end of maxillary tooth patch (Fig. 8) . . . . . ***Uroconger syringinus***

19b. Vomerine teeth in 2 or more rows, at least anteriorly, ending before posterior end of maxillary tooth patch . . . . . → ***20***

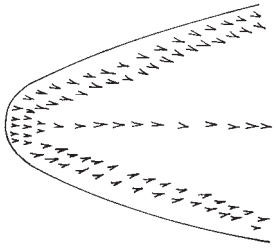


Fig. 8 teeth

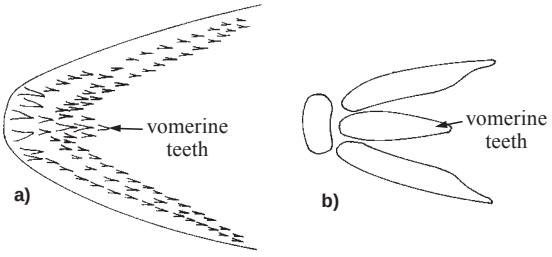


Fig. 9 tooth patches on roof of mouth

20a. Vomerine tooth patch either with a few enlarged teeth or, if teeth granular, patch ends less than halfway to posterior end of maxillary tooth patch (Fig. 9a) . . . . . → ***21***

20b. Vomerine teeth in a more or less broad patch, reaching at least halfway to posterior end of maxillary tooth patch (Fig. 9b) . . . . . → ***29***

21a. Teeth small; vomerine tooth patch round or slightly elongate; rudimentary upper labial flange present; pores along upper jaw small (Fig. 10a) . . . . . → *22*

21b. Vomerine tooth patch with some enlarged teeth, sometimes forming a short row posteriorly; upper labial flange absent; pores along upper jaw enlarged (Fig. 10b) . . . . . → *24*

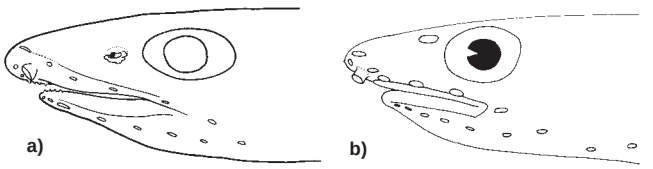


Fig. 10 lateral view of head

22a. A pore present in supraorbital canal between anterior and posterior nostril (Fig. 11) . . . . . *Rhynchoconger gracilior*

22b. No supraorbital pore between anterior and posterior nostril . . . . . → *23*

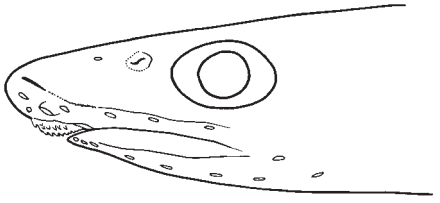
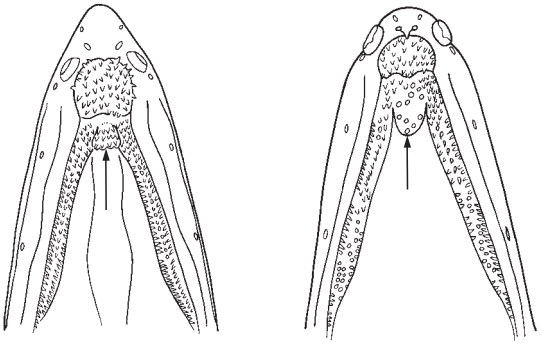


Fig. 11 lateral view of head



a) ***Rhynchoconger flavus*** **b)** ***Rhynchoconger guppyi***

Fig. 12 ventral view of snout and roof of mouth

23a. Vomerine tooth patch as broad as long (Fig. 12a); stomach pale . . . . . *Rhynchoconger flavus*

23b. Vomerine tooth patch slightly longer than broad (Fig. 12b); stomach black . . *Rhynchoconger guppyi*

24a. Upper jaw projecting beyond lower; teeth moderately large, but not fang-like (Fig. 13a) . . . . . → *25*

24b. Jaws nearly equal; anterior teeth very strong, fang-like (Fig. 13b) . . . . . *Bathyuroconger vicinus*

25a. Posterior nostril at mideye level (Fig. 14a) . . . . . *Bathycongrus dubius*

25b. Posterior nostril opposite upper margin of eye (Fig. 14b) . . . . . → *26*

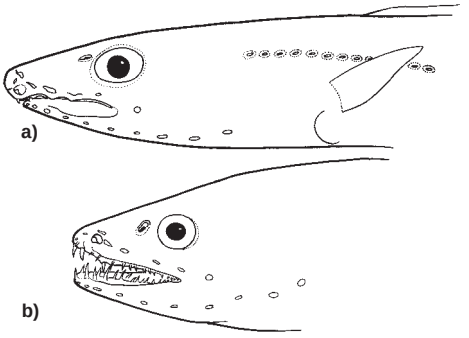


Fig. 13 lateral view of head

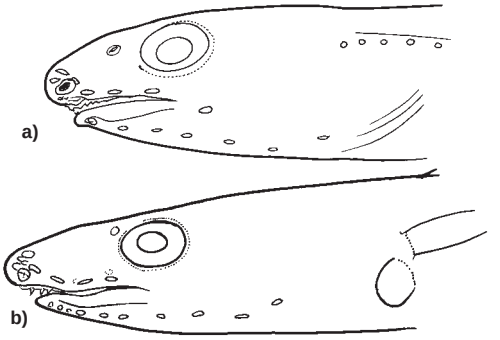


Fig. 14 lateral view of head

26a. Preanal lateral-line pores fewer than 40 . . . . . → *27*
26b. Preanal pores more than 40 . . . . . → *28*

27a. Preanal lateral-line pores about 26 to 29 . . . . . *Bathycongrus thysanochila*
27b. Preanal lateral-line pores 33 to 38. . . . . *Bathycongrus vicinalis*

28a. One supratemporal pore; postorbital pores absent. . . . . *Bathycongrus bullisi*
28b. Three supratemporal pores; postorbital pores present . . . . . *Bathycongrus polyporus*

29a. Intermaxillary tooth patch separated from maxillary and vomerine teeth by a distinct gap (Fig. 15a); supratemporal pores present; dorsal fin begins before pectoral-fin base (Fig. 16a)
. . . . . *Japonoconger caribbeus*

29b. Intermaxillary tooth patch confluent with maxillary and vomerine teeth (Fig. 15b); supratemporal pores absent; dorsal fin begins behind pectoral-fin base (Fig. 16b) . . . . . → *30*

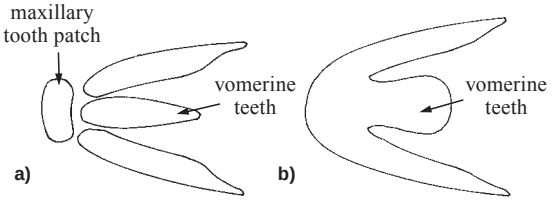
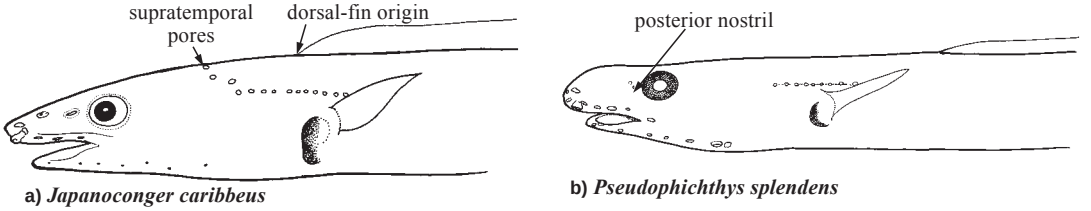


Fig. 15 tooth patches on roof of mouth



a) ***Japanoconger caribbeus*** **b)** ***Pseudophichthys splendens***

Fig. 16 lateral view of head

30a. Posterior nostril at mideye level (Fig. 16b)
. . . . . *Pseudophichthys splendens*

30b. Posterior nostril opposite upper margin of eye (Fig. 17) . . . . . → *31*

31a. Vertebrae 159 to 164 . . . . *Acromycter perturbator*
31b. Vertebrae 167 to 171. . . . . *Acromycter atlanticus*

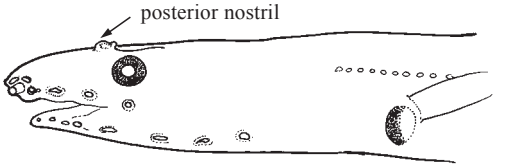


Fig. 17 lateral view of head

List of species occurring in the area

Subfamily Heterocongrinae

Heteroconger longissimus Günther, 1870. To about 50 cm TL. Caribbean and Bahamas, also E tropical Atlantic. (Formerly treated as *Nystactichthys halis*).

Heteroconger luteolus Smith, 1989. Maximum size uncertain, probably similar to *H. longissimus*. Gulf of Mexico and E coast of Florida.

Subfamily Bathymyrinae

Ariosoma anale (Poey, 1860). To 35 to 40 cm TL. Florida to Guianas, also Gulf of Guinea.

Ariosoma balearicum (Delaroche, 1809). To 35 cm TL. Cape Hatteras to N Brazil, also E tropical Atlantic and Mediterranean.

Ariosoma coquettei Smith and Kanazawa, 1977. To around 30 cm TL. Guianas.

Ariosoma selenops Reid, 1934. To 55 cm TL. Florida to Guianas.

Parabathymyrus oregoni Smith and Kanazawa, 1977. To 35 cm TL. Gulf of Mexico to Guianas.

Paraconger caudilimbatus (Poey, 1867). To 50 cm TL. Gulf of Mexico, Bermuda, Bahamas, and Caribbean.
Paraconger guianensis Kanazawa, 1961. To 50 cm TL. Guianas and N Brazil.

Subfamily Congrinae

Acromycter atlanticus Smith, 1989. To 30 cm TL. Florida and Caribbean.
Acromycter perturbator (Parr, 1932). To 30 cm TL. Mid-Atlantic Bight to Caribbean.

Bathycongrus bullisi (Smith and Kanazawa, 1977). To 60 cm TL. Continental margin from N Gulf of Mexico to Brazil.
Bathycongrus dubius (Breder, 1927). To 45 cm TL. Georgia and N Gulf of Mexico to Guianas.
Bathycongrus polyporus (Smith and Kanazawa, 1977). To 42 cm TL. Bahamas and Cuba.
Bathycongrus thysanochilus (Reid, 1934). To 30 cm TL. Bahamas and Caribbean.
Bathycongrus vicinalis (Garman, 1899). To 47 cm TL. Gulf of Mexico to Brazil.

Bathyuroconger vicinus (Vaillant, 1888). To 90 cm TL. Gulf of Mexico to Guianas; also E tropical Atlantic and Indo-West Pacific.

Conger esculentus Poey, 1861. To 160 cm TL. Bermuda and Greater Antilles.
Conger oceanicus (Mitchill, 1818). To 2 m. Cape Cod to Florida and Gulf of Mexico.
Conger triporiceps Kanazawa, 1958. To 1 m TL. Bermuda, Bahamas, and Caribbean.

Gnathophis bathytopos Smith and Kanazawa, 1977. To 35 to 40 cm TL. Cape Hatteras to Yucatan.
Gnathophis bracheatopos Smith and Kanazawa, 1977. To 35 cm TL. North Carolina to E Gulf of Mexico.
Gnathophis tritos Smith and Kanazawa, 1977. To 20 cm TL. Bahamas and Cuba.

Japonoconger caribbeus Smith and Kanazawa, 1977. To 50 cm TL. S Caribbean.

Pseudophichthys splendens (Lea, 1913). To 40 cm TL. Florida to Guianas; also E Atlantic.

Rhynchoconger flavus (Goode and Bean, 1896). To 2 m TL. Gulf of Mexico to Brazil.
Rhynchoconger gracilior (Ginsburg, 1951). To 50 cm TL, possibly greater. E Gulf of Mexico and South Carolina to Guianas.
Rhynchoconger guppyi (Norman, 1925). To 1 m TL. Caribbean.

Uroconger syringinus Ginsburg, 1954. To 40 cm TL. Florida and N Gulf of Mexico to Guianas.

Xenomystax austrinus Smith and Kanazawa, 1989. To 1 m TL. Caribbean.
Xenomystax bidentatus (Reid, 1940). To 55 cm TL. Straits of Florida and Caribbean.
Xenomystax congroides Smith and Kanazawa, 1989. To 90 cm TL. Gulf of Mexico and Bahamas to Brazil; also E tropical Atlantic.

Reference

Smith, D.G. 1989. Family Congridae. In Fishes of the Western North Atlantic, edited by E.B. Böhlke. *Mem. Sears Found. Mar. Res.*, 1(9):460-567.