

Order ANGUILLIFORMES

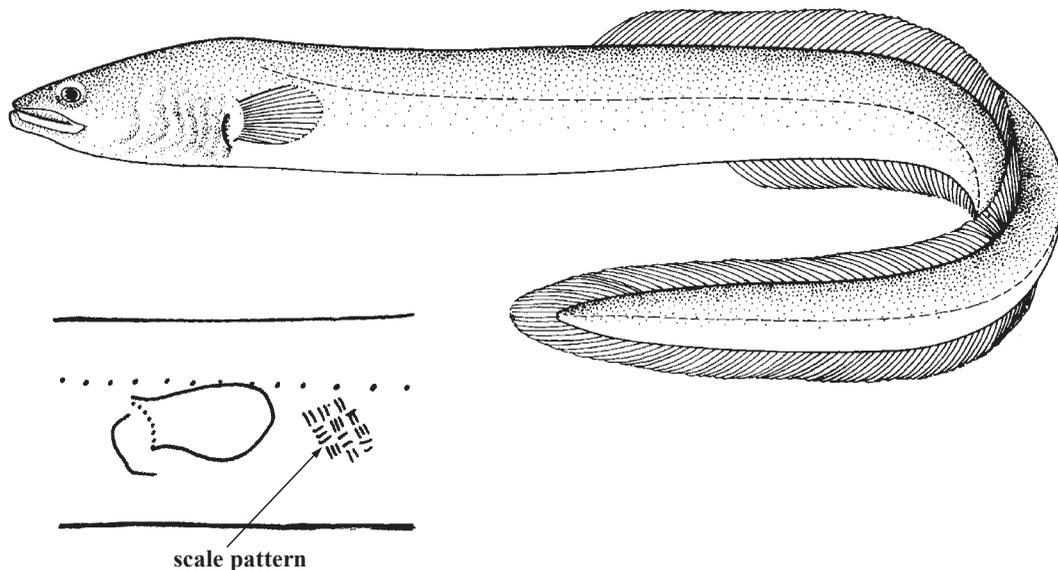
ANGUILLIDAE

Freshwater eels

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

A single species occurring in the area.*Anguilla rostrata* (Lesueur, 1817)

ELA

Frequent synonyms / misidentifications: None / None.**FAO names:** En - American eel; Fr - Anguille d'Amérique; Sp - Anguila americana.

Diagnostic characters: Body moderately elongate, cylindrical in front and only moderately compressed along the tail. Eye well developed, moderately small in females and immatures, markedly enlarged in mature males. Snout rounded. Anterior nostril tubular, near tip of snout; posterior nostril a simple opening in front of eye at about mid-eye level. Mouth moderately large, gape ending near rear margin of eye; **lower jaw projects beyond upper; well developed fleshy flanges on upper and lower lips. Teeth small, granular, in narrow to broad bands on jaws and vomer.** Dorsal and anal fins continuous around tail; **dorsal fin begins well behind pectoral fin, closer to anus than to pectoral-fin base; pectoral fin well developed. Small oval scales present, embedded in skin and arranged in a basket-weave pattern.** Lateral line complete. **Colour:** immature individuals, called yellow eels, vary from yellowish green to brown above, paler ventrally; sexually mature individuals become bicoloured, black above and white below, with a bronze or silvery sheen, and are then referred to as silver eels or bronze eels.

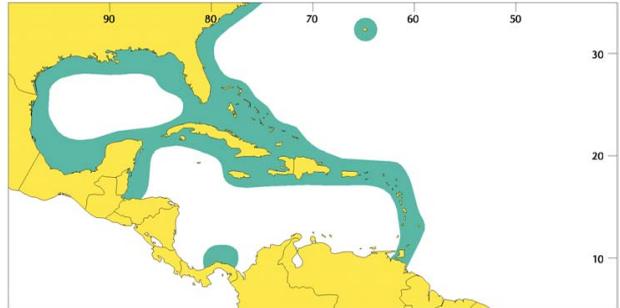
Size: Maximum about 150 cm, common to 50 cm; females grow much larger than males.

Similar species occurring in the area

The combination of the following characters will distinguish *Anguilla rostrata* from all other species of eels in the area: presence of scales and of pectoral fins; teeth in upper and lower jaws minute; lower jaw protruding beyond upper jaw; dorsal fin begins far behind pectoral fins, closer to anus than to pectoral-fin base.

Habitat, biology, and fisheries: Adults of *Anguilla rostrata* spend most of their lives in fresh water or estuarine habitats. They are nocturnal, hiding by day and coming out at night to forage. They take almost any available food, mainly small, benthic invertebrates and fishes. They are extremely hardy and live in a wide variety of aquatic habitats. Mature eels leave fresh water in the autumn and travel to the Sargasso Sea, where they spawn in late winter and early spring. Spawning is the terminal event in the eel's life, and it dies without returning to fresh water. The eggs hatch into larvae called leptocephali, which are carried on the currents back to the continent. When they reach the edge of the continental shelf, they metamorphose into juvenile eels called elvers and enter fresh water the following spring. Elvers are caught with fine-mesh fyke nets and dip nets in the spring during their inshore migration. Yellow eels are caught with baited eel pots and trot lines. Silver eels are taken in pound nets in estuarine areas during seaward migration. Most of the catch is exported to Europe and East Asia, where eels are considered a delicacy. They are less popular in North America, where they are marketed fresh, salted, or smoked. FAO statistics report landings ranging from 2 to 43 t from 1995 to 1999. Elvers have been exported to Japan and Taiwan Province of China for use in aquaculture.

Distribution: Widely distributed in lands bordering the western North Atlantic from Greenland to Trinidad, including the Gulf of Mexico; most common along the Atlantic coast of the USA and southern Canada.



Reference

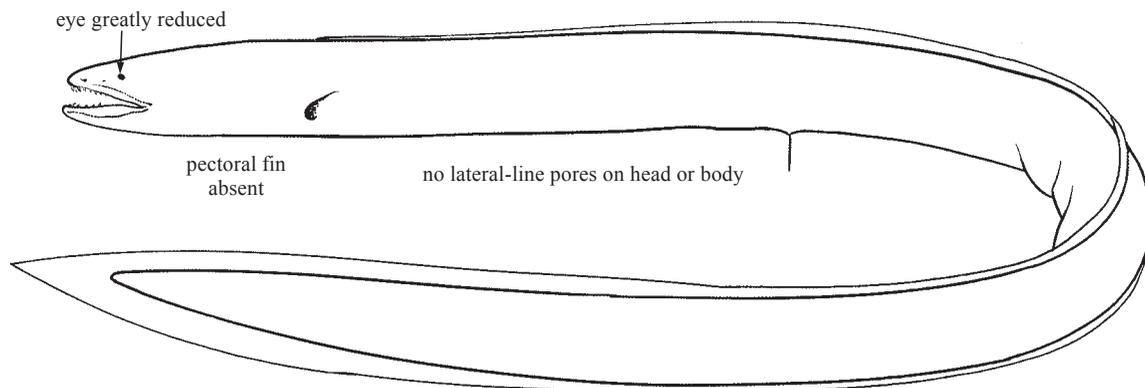
Smith, D. G. 1989. Family Anguillidae. In *Fishes of the Western North Atlantic*, edited by E. B. Böhlke. *Mem. Sears Found. Mar. Res.*, 1(9):25-47.

HETERENCHELYIDAE

Mud eels

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

Diagnostic characters: Medium-sized eels, maximum size about 1 m. Body moderately elongate to elongate, cylindrical anteriorly, compressed posteriorly, tail longer than head and trunk. Head moderate; **eye greatly reduced, covered by semi-transparent skin**; jaws nearly equal or lower jaw projects slightly beyond upper; mouth relatively large, gape ending well behind eye; teeth conical to molariform, bi- or triserial on jaws, in 1 to several rows on vomer. Dorsal and anal fins low and confluent with caudal fin; dorsal fin begins over or slightly behind gill opening; **pectoral fin absent**. Scales absent. **Lateral line absent, no pores on head or body**. **Colour:** grey or brown in preservative; freshly collected specimens largely unpigmented, with a reddish cast due to blood in superficial capillaries.



Habitat, biology, and fisheries: Heterenchelyids are burrowing eels that spend most or all of their time buried in the substrate. They are seldom seen, and virtually nothing is known about their biology. They are rare and of no importance to fisheries.

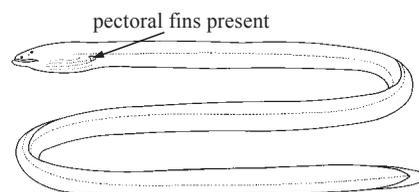
Remarks: The centre of distribution of the Heterenchelyidae is the eastern Atlantic, where 2 genera and several species occur. A single species occurs in the area; it has been recorded from scattered localities in the Caribbean and northern South America, in relatively shallow water.

Similar families occurring in the area

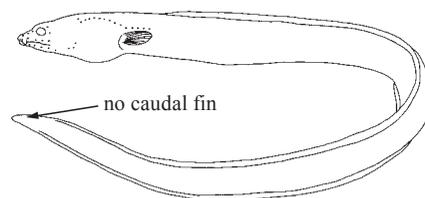
The only other eels with eyes as reduced as those of the heterenchelyids are the Moringuidae and certain members of the Ophichthidae. Both of these families have lateral lines with pores on the body, at least anteriorly.

Moringuidae: *Moringua* has a strongly projecting lower jaw, and both the anus and the dorsal-fin origin are well behind midlength. *Neoconger* has the upper jaw projecting beyond the lower, and its dorsal fin begins slightly before the anus. Both moringuid genera have pectoral fins, although that of *Moringua* is often reduced.

Ophichthidae: the small-eyed, burrowing ophichthids of the subfamily Ophichthinae have no caudal fin, and the tail ends in a hard, finless point. Ophichthids have a well-developed lateral line with pores on the head and body, and in nearly all of them the upper jaw projects beyond the lower.



Moringuidae



Ophichthidae

List of species occurring in the area

Pythonichthys sanguineus Poey, 1868. Maximum size about 80 cm. Caribbean and N South America.

Reference

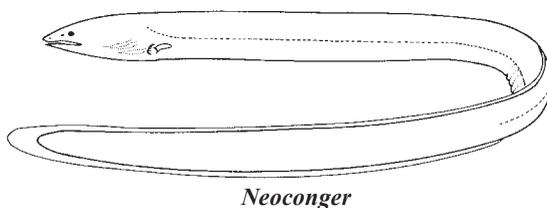
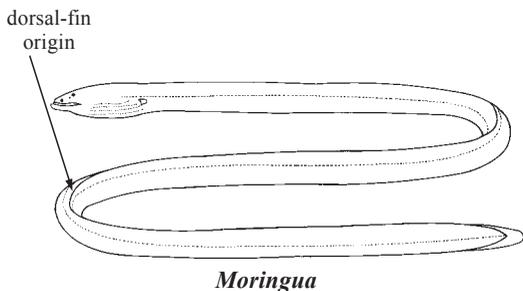
Smith, D.G. 1989. Family Heterenchelyidae. In *Fishes of the Western North Atlantic*, edited by E.B. Böhlke. *Mem. Sears Found. Mar. Res.*, 1(9):48-54.

MORINGUIDAE

Spaghetti eels

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

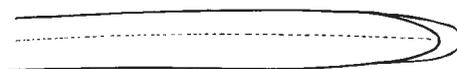
Diagnostic characters: Small eels, maximum size 50 cm. Body moderately elongate to very elongate, cylindrical except near tip of tail; anus near or behind midlength; tip of tail soft, blunt. **Eye reduced except in mature *Moringua***; snout not greatly prolonged; anterior nostril with a low tube or without a tube, posterior nostril in front of eye; mouth moderate, gape ending under or slightly behind eye; upper lip without an upturned flange; lower lip with or without a groove separating it from remainder of lower jaw; teeth conical, small to moderately enlarged, in 1 or 2 series on jaws and vomer; intermaxillary teeth generally the largest, arranged in 2 longitudinal rows or in a semicircle. All fins present though sometimes reduced; dorsal and anal fins confluent with caudal fin; **dorsal fin begins far behind head, slightly before or well behind midlength**; anal fin begins at or distinctly behind anus. Scales absent. Lateral line on body complete or present only on trunk; **on head, pores present only on lower jaw**. **Colour:** *Neoconger*: grey to brown in life, with some red on fins and head. *Moringua*: immatures yellow-orange above and yellow or white below with some reddish tinting, mature individuals countershaded with dark grey to black above and white below. In preservative, all moringuids featureless grey to tan.



immature *Moringua*



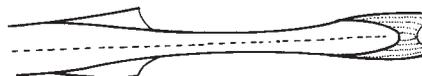
immature male *Moringua*



mature female *Moringua*



mature *Moringua*



mature male *Moringua*



Habitat, biology, and fisheries: Moringuids are burrowing eels that spend much of their time buried in the sediment. *Moringua* lives in clear water over sandy bottoms and is common around coral reefs. *Neoconger* is found over muddy bottoms along the continental shelf. They feed mainly on small invertebrates. Although seldom seen, moringuids can be quite common and probably play an important ecological role. *Neoconger* is occasionally taken in trawls, and mature *Moringua* sometimes appear at the surface around night lights. Moringuids are of no importance to fisheries.

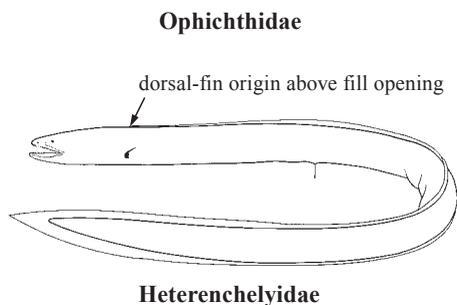
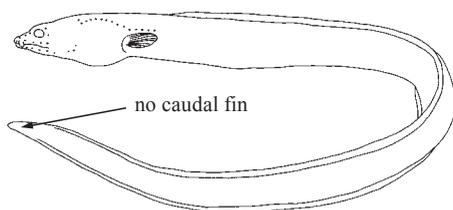
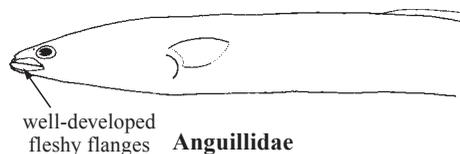
Remarks: The Moringuidae contains 2 different-looking genera. *Moringua* is much more elongate and changes greatly in form and colour during its life. Immature individuals are worm-like, with reduced eyes and fins, and a projecting lower jaw; they are yellow or red in life (the red probably resulting from blood in superficial capillaries rather than a specific pigment). At maturity, the eyes and pectoral fins enlarge, and the dorsal and anal fins expand near the tail to form a paddle-like tail fin. Colour changes to brown or black above and white below. These features are more strongly expressed in males than females, and females grow much larger than males. Immatures spend most if not all of their time buried in the sand, but mature males and females may emerge and swim near the surface. *Neoconger* is only moderately elongate, uniformly grey in colour, with small eyes, and the snout projects beyond the lower jaw. Its lateral line is incomplete, ending at about the level of the anus.

Similar families occurring in the area

Anguillidae: *Moringua* is distinguished from all other families except the Anguillidae by the protruding lower jaw. Anguillids have small, embedded scales; well-developed fleshy flanges on the upper and lower lip; a large eye; and pectoral fin at all stages of their life. The anus is located at or slightly in front of midlength, and the dorsal fin begins in front of the anus. *Moringua* lacks scales, the lips are without flanges, the anus is located well behind the midpoint of the body, and the dorsal fin begins approximately above the anus.

Ophichthidae: *Neoconger* is likely to be confused only with certain ophichthids. Most ophichthids (Ophichthinae) lack a caudal fin, and the tip of the tail is hard and pointed. Those ophichthids with a caudal fin (Myrophinae) have the posterior nostril below the middle of the eye (sometimes concealed in the upper lip) and have pores on the upper jaw. *Neoconger* has the posterior nostril at about mid-eye level and lacks pores on the upper jaw. Ophichthids also have more numerous branchiostegal rays.

Heterenchelyidae: lack pectoral fins at all stages, and the dorsal fin begins over the gill opening. The lateral line is absent, with no pores on the head or body.



Key to the species of Moringuidae occurring in the area

- 1a. Upper jaw projects beyond lower; anus near midlength; lateral line ends near level of anus
 *Neoconger mucronatus*
- 1b. Lower jaw projects beyond upper; anus distinctly behind midlength; lateral line complete
 *Moringua edwardsi*

List of species occurring in the area

- Moringua edwardsi* (Jordan and Bollman, 1889). To about 60 cm. Bermuda, Bahamas, and Caribbean.
- Neoconger mucronatus* Girard, 1858. To about 30 cm. Gulf of Mexico to Brazil.

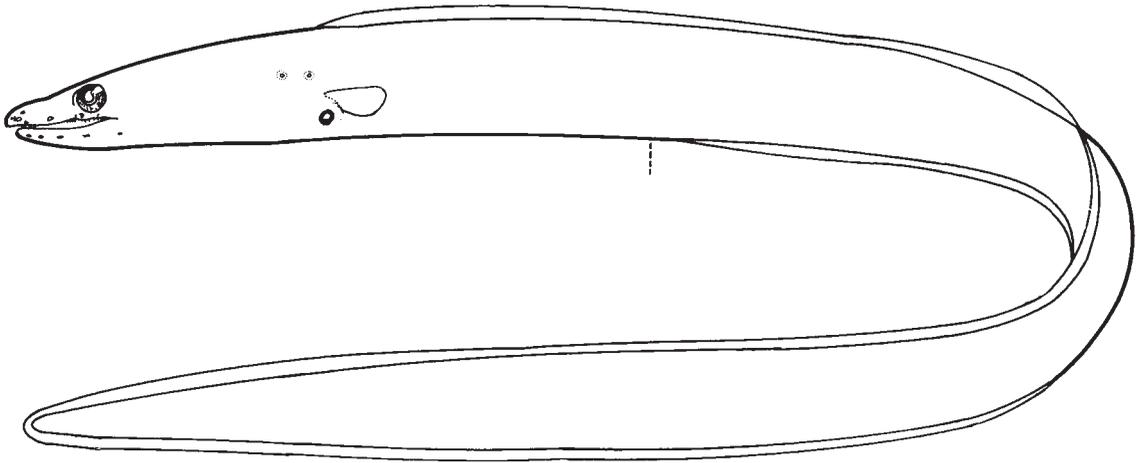
Reference

Smith, D. G. 1989. Family Moringuidae. In Fishes of the Western North Atlantic, edited by E. B. Böhlke. *Mem. Sears Found. Mar. Res.*, 1(9):55-71.

CHLOPSIDAE**False morays**

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

Diagnostic characters: Small eels, no more than 30 cm, usually 15 to 20 cm. Body stout to moderately elongate, compressed, anus slightly before midbody. **Eye well developed.** Snout moderate to short, projecting slightly beyond tip of lower jaw. Anterior nostril in a short tube, near tip of snout; **posterior nostril located below mideye level, either on side of head above lip, on lip and covered with a flap, or opening inside mouth. Upper lip without an upturned fleshy flange; lower lip with or without a downturned fleshy flange.** Teeth small and conical or long and needle-like, in 2 to several series on jaws, and 1 or 2 rows on vomer; large fangs never present. **Gill opening reduced to a small, round, pore-like opening.** Dorsal and anal fins well developed, confluent with caudal fin; **dorsal fin begins over or slightly behind gill opening. Pectoral fin present or absent.** Scales absent. **Lateral line incomplete, usually reduced to 1 or 2 pores at anterior end of canal in front of pectoral fin.** **Colour:** variable, most often brown, and frequently countershaded with white ventrally; 1 species with a pale nuchal band.



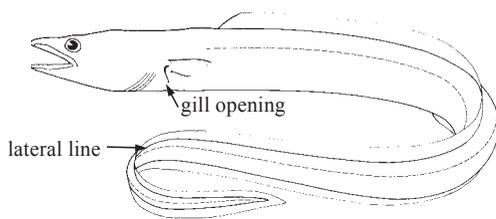
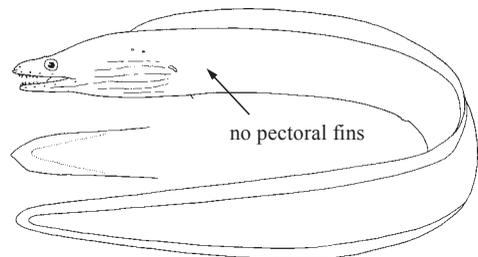
Habitat, biology, and fisheries: Chlopsids are small, cryptic eels inhabiting coral reefs, seagrass beds, and rubble. They are seldom seen except at rotenone stations. Some species occasionally turn up in trawls, but their retiring habits and preference for rough bottoms place them beyond the reach of most collecting methods. They are of no importance to fisheries.

Remarks: This family was formerly known as the Xenocongridae. A few species are common, but most are quite rare.

Similar families occurring in the area

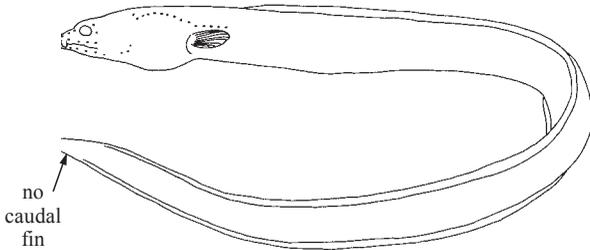
Congridae: those chlopsids with pectoral fins are most likely to be confused with congrids; congrids have a complete lateral line, however, and a larger gill opening.

Muraenidae: muraenids always lack a pectoral fin, and the posterior nostril is at or above the upper margin of the eye; enlarged, fang-like teeth are usually present.

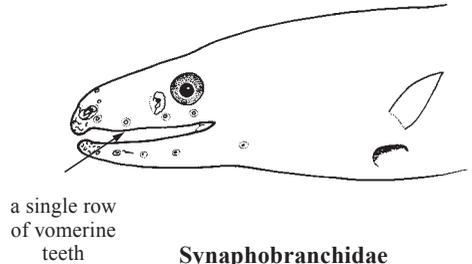
**Congridae****Muraenidae**

Ophichthidae: also have the posterior nostril low on the side of the head or on the lip. Those of the subfamily Ophichthinae lack a caudal fin, and the tip of the tail is hard and pointed. Those of the subfamily Myrophinae have a caudal fin, but they have an expanded branchial basket with numerous branchiostegal rays, most of which are not attached to the hyoid bones.

Synphobranchidae (Ilyophinae): some have a reduced lateral line and resemble chlopsids; they also have the posterior nostril low on the side of the snout, further enhancing the resemblance. Most ilyophines, however, have more than 2 lateral-line pores; the only exception is *Dysommia*, which has no open pores. Most ilyophines have a single row of vomerine teeth, each tooth composed of 2 fused teeth. Most chlopsids have 2 rows of vomerine teeth; in those that have 1 row, the teeth are simple, not compound.



Ophichthidae



Synphobranchidae

Key to the species of Chlopsidae occurring in the area

- 1a. Vomerine teeth in a single series on midline of roof of mouth (Fig. 1) *Robinsia catherinae*
- 1b. Vomerine teeth in 2 or 4 series (Figs 2, 3) 2

- 2a. Pectoral fin present 3
- 2b. Pectoral fin absent 5

- 3a. Vomerine teeth in 4 series (Fig. 2). *Catesbya pseudomuraena*
- 3b. Vomerine teeth in 2 series (Fig. 3) 4

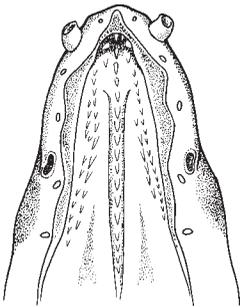


Fig. 1

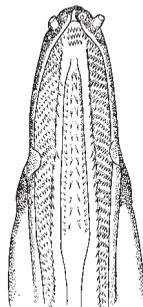


Fig. 2

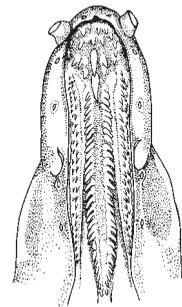


Fig. 3

- 4a. Posterior nostril on upper lip, concealed by a flap dorsally; head uniform in colour (Fig. 4) *Kaupichthys hyproroides*
- 4b. Posterior nostril a simple opening on side of head opposite lower part of eye (Fig. 5); head with a pale transverse band behind eye *Kaupichthys nuchalis*

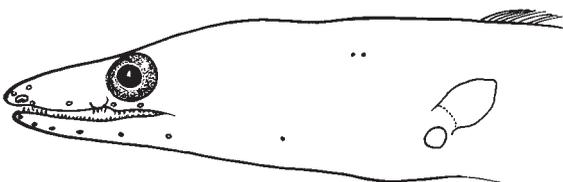


Fig. 4

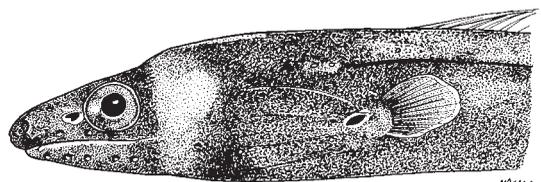


Fig. 5

- 5a. Lower lip with a downturned flange (Fig. 6) *Chilorhinus suensonii*
- 5b. Lower lip without a downturned flange → 6
- 6a. Bicoloured, brown above and white below (Fig. 7) *Chlopsis bicolor*
- 6b. Banded or mottled in colour (Fig. 8) *Chlopsis dentatus*

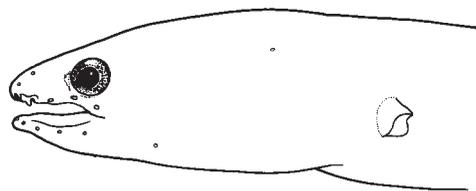


Fig. 6

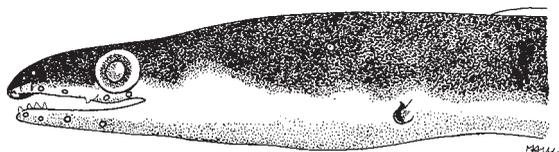


Fig. 7

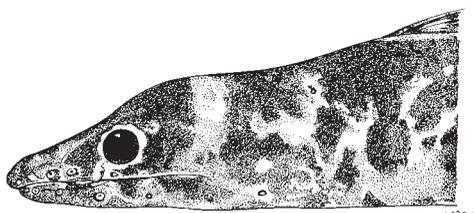


Fig. 8

List of species occurring in the area

- Catesbya pseudomuraena* Böhlke and Smith, 1968. To 15 cm. Known from the Bahamas.
- Chilorhinus suensonii* Lütken, 1852. To 20 cm. Bermuda and Bahamas to Brazil.
- Chlopsis bicolor* Rafinesque, 1810. To about 24 cm. E and W Atlantic, including the Mediterranean.
- Chlopsis dentatus* (Seale, 1917). To 20 cm. Caribbean; also Indian Ocean, W Pacific.
- Kaupichthys hyoprорoides* (Strömman, 1896). To 24 cm. Throughout the area on coral reefs.
- Kaupichthys nuchalis* Böhlke, 1967. To 14 cm. Throughout the area on coral reefs.
- Robinsia catherinae* Böhlke and Smith, 1967. To 20 cm. Caribbean; also Indian Ocean.

Reference

Smith, D.G. 1989. Family Chlopsidae. In Fishes of the Western North Atlantic, Part 9, edited by E. B. Böhlke. *Mem. Sears Found. Mar. Res.*, 1(9):72-97.