

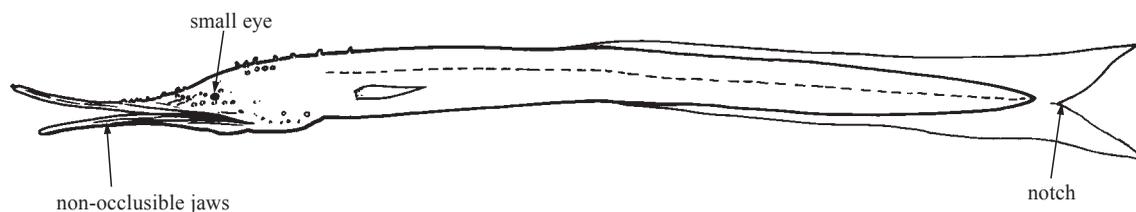
## Order SACCOPHARYNGIFORMES

## CYEMATIDAE

## Bobtail eels

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

**Diagnostic characters:** Small eels, maximum size probably not more than 15 cm total length. Body short and stubby, anus at or slightly behind midlength. Eye small. **Jaws long and slender, diverging toward tips, forming a non-occlusible beak; gape of mouth extends well behind eye. Anterior and posterior nostrils close together, immediately in front of eye;** anterior nostril in a low tube. Teeth small and granular, in multiple rows. Dorsal and anal fins complete, continuous with caudal fin; **rays of both dorsal and anal fins lengthened just before tip of tail, giving posterior end of body a notched appearance.** Pectoral fin present. Scales absent. Lateral line reduced; **pores on body absent, replaced by small, dermal papillae;** additional papillae on head; some pores around eye and on snout. **Colour:** black or reddish, without markings.



**Habitat, biology, and fisheries:** Cyematids live in midwater at depths of 1 500 to 3 000 m. Little is known of their biology; there is no indication of sexual dimorphism. They are of no importance to fisheries and are seldom seen except when brought up by deep-towed midwater trawls.

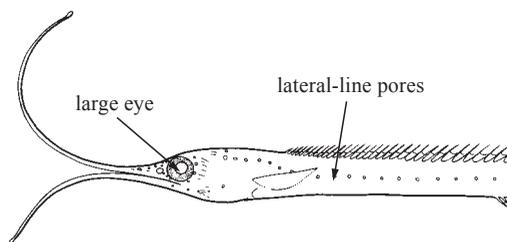
**Remarks:** Two genera are known, each with a single recognized species. *Cyema atrum* is the most common and occurs in all oceans. *Neocyema erythrosoma* Castle, 1978 is known only from the South Atlantic. Several distinct kinds of leptocephali are known, however, indicating that additional species exist.

#### Similar families occurring in the area

Cyematids are so distinctive in appearance that they cannot be confused with any other eels. Only the nemichthyids have a prolonged, non-occlusible beak, but nemichthyids are greatly elongate, with large eyes and well-developed lateral-line pores.

#### List of species occurring in the area

*Cyema atrum* Günther, 1878. To 14 cm. Worldwide.



Nemichthyidae

#### Reference

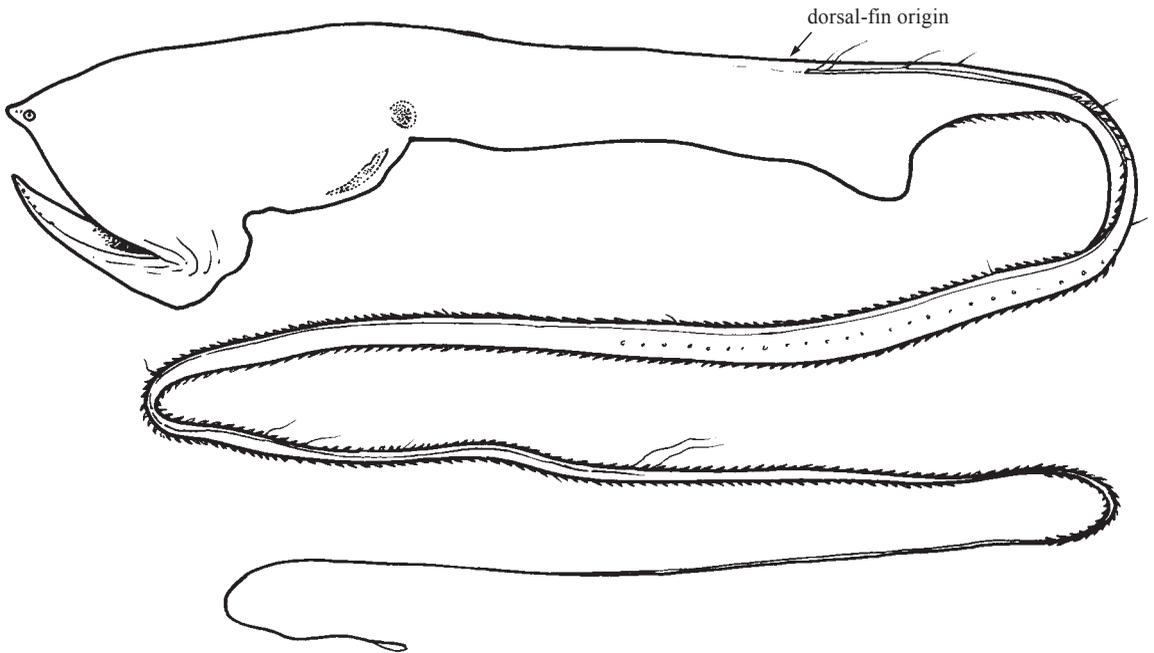
Smith, D.G. 1989. Family Cyematidae. In *Fishes of the Western North Atlantic*, edited by E.B. Böhlke. *Mem. Sears Found. Mar. Res.*, 1(9):630-635.

## SACCOPHARYNGIDAE

### Swallower eels

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

**Diagnostic characters:** Can reach nearly 2 m in total length, but most of this is the slender, attenuate caudal region. **Body very elongate; tail attenuate and ending in an expanded caudal organ of variable structure, often luminous;** anus near anterior 1/3 to 1/5 of total length; **abdomen distensible, usually distinctly deeper than tail.** Head large and deep, most of its length in postcranial part. Eye small. Snout short, beak-like; anterior and posterior nostrils small and close together, in front of eye. **Mouth greatly enlarged by a backward extension of jaws, gape extending far behind eye;** teeth slender, recurved, depressible, arranged in 3 or 4 overlapping rows. Dorsal and anal fins present, ending before tip of tail; dorsal fin begins well behind head, a short distance in front of anus; caudal fin absent; pectoral fin present. **A pair of white lines or grooves on each side of dorsal fin, of uncertain function.** Scales absent. Lateral line without pores, but with a series of papillae. **Colour:** black, without markings.



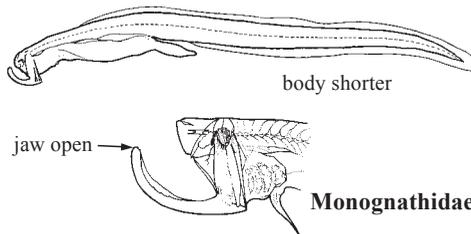
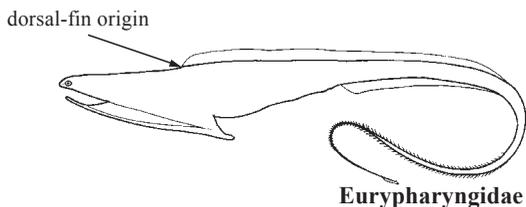
**Habitat, biology, and fisheries:** Saccopharyngids live pelagically at depths of 1 000 to 3 000 m. They feed mainly on fish, and their large mouth and distensible abdomen enable them to swallow large prey. It has been speculated that the luminous caudal organ serves as a lure to attract prey, but this has not been confirmed by observation. Saccopharyngids display some sexual dimorphism at maturity; males show a reduction of the feeding apparatus and an enlargement of the eye and olfactory organ. Saccopharyngids are rare and of no importance to fisheries.

**Remarks:** The Saccopharyngidae is one of 3 families of highly modified, midwater eels commonly known as gulpers; the others are the Eurypharyngidae and Monognathidae. Gulpers are characterized by the reduction and loss of many skeletal elements. Their precise relationship to the other eels is still uncertain, but they are usually placed in a separate order, the Saccopharyngiformes. The Saccopharyngidae contains a single genus, *Saccopharynx*, with approximately 9 species worldwide.

**Similar families occurring in the area**

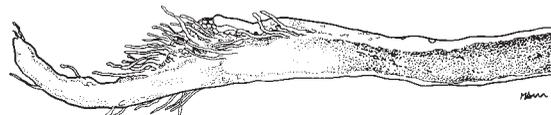
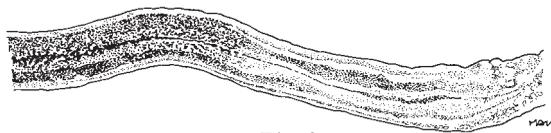
Eurypharyngidae: the monotypic family Eurypharyngidae is the only fish likely to be confused with *Saccopharynx*. In *Eurypharynx* the mouth is even larger than in *Saccopharynx*, greater than half the preanal length as opposed to less than 40%. In *Eurypharynx* the dorsal fin begins in front of the pectoral fin instead of far behind it. *Eurypharynx* also has smaller teeth.

Monognathidae: the monognathids lack an upper jaw, and their bodies are much less elongate.



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

- 1a. Caudal organ distinctly expanded with angular or notched edges (Fig. 1); body filaments 1 to 3  
 . . . . . *Saccopharynx harrisoni*
- 1b. Caudal organ indistinctly expanded with smoothly curved edges (Figs 2, 3); many body filaments, except in juveniles . . . . . → 2
- 2a. Body filaments on both trunk and tail; caudal organ without well-developed filaments (Fig. 2)  
 . . . . . *Saccopharynx ampullaceus*
- 2b. Body filaments only on tail; caudal organ with well-developed filaments (Fig. 3) . . . . . *Saccopharynx thalassa*



**List of species occurring in the area**

- Saccopharynx ampullaceus* (Harwood, 1827). To 160 cm. Widely distributed in the N Atlantic, but known from few records.
- Saccopharynx harrisoni* Beebe, 1932. To 170 cm. Known from 3 widely scattered records in the N and S Atlantic; the single record from the area is from Bermuda.
- Saccopharynx thalassa* Nielsen and Bertelsen, 1985. To 110 cm. Known from 3 specimens, 1 from Bermuda and 2 from the Canary Islands.

**Reference**

Nielsen, J.G. and E. Bertelsen. 1985. The gulper-eel family Saccopharyngidae (Pisces, Anguilliformes). *Steenstrupia*, 11(6):157-206.

**EURYPHARYNGIDAE**

**Gulper eels**

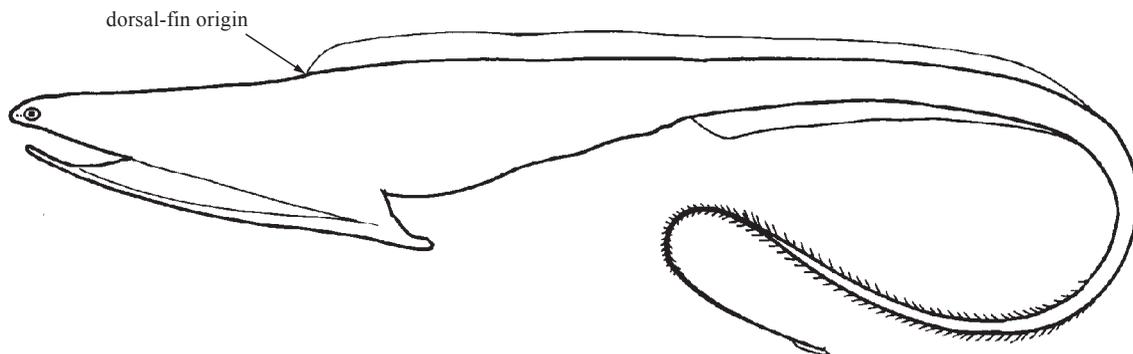
by D.G. Smith, National Museum of Natural History, Washington, D.C., USA

**A single species in this family.**

*Eurypharynx pelecanooides* Vaillant, 1882

**Frequent synonyms / misidentifications:** *Gastrostomus bairdi* Gill and Ryder, 1883 / None.

**FAO names:** En - Gulper eel.



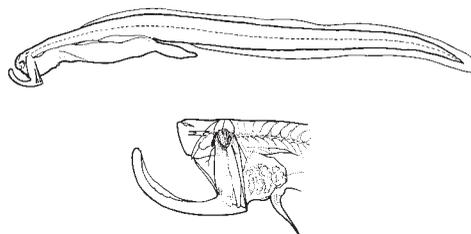
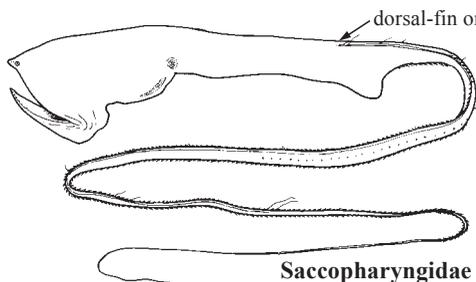
**Diagnostic characters:** Maximum size about 75 cm, but much of this consists of the slender caudal region. **Body elongate, tail attenuated and ending in an expanded, luminous caudal organ;** anus near anterior third of total length. Head large and deep, most of its length in postcranial part. Eye small. Snout short; anterior and posterior nostrils close together, in front of eye. **Mouth greatly enlarged by a backward extension of jaws, gape comprising half or more of preanal length; buccal cavity greatly distensible;** teeth small, close-set, with recurved tips, in several rows on jaws. Dorsal and anal fins present, but ending before tip of tail; **dorsal fin begins about midway between tip of snout and anus;** caudal fin absent; pectoral fin rudimentary. **A pair of white lines or grooves, 1 on each side of dorsal fin, of uncertain function.** Scales absent. Lateral line with groups of elevated tubules instead of pores. **Colour:** black, without markings.

**Similar families occurring in the area**

Note: The Eurypharyngidae, Saccopharyngidae, and Monognathidae are placed together in the order Saccopharyngiformes and are characterized by the reduction and loss of many skeletal elements. They are unlikely to be confused with any other fishes.

Saccopharyngidae: *Saccopharynx*, the only genus in the Saccopharyngidae, resembles *Eurypharynx* in many ways. It has a smaller mouth, however, some 40% or less of the preanal length. The teeth are larger, and the dorsal fin begins over or slightly in front of the anus.

Monognathidae: have a much shorter body, a smaller mouth, and lack an upper jaw.



**Habitat, biology, and fisheries:** *Eurypharynx pelecanoioides* is a midwater fish, occurring to about 3 000 m. Its principal food seems to be crustaceans, but it also takes fishes, cephalopods, and other invertebrates. Although the mouth is large, the stomach is not greatly distensible, as it is in the related saccopharyngids. This, along with the weak dentition and generally feeble structure of the mouth, indicates that *Eurypharynx* does not take large individual prey organisms. Instead, it seems adapted for engulfing smaller animals along with a quantity of surrounding water. After the prey has been captured, the water is expelled through the gill openings and the prey is swallowed. Males undergo pronounced morphological changes at maturity: the olfactory organs enlarge, the jaws degenerate, and the teeth are reduced or lost. Females remain relatively unchanged. *Eurypharynx pelecanoioides* is fairly common in its depth range, but most specimens are badly damaged during net capture, and it is rare to see an intact specimen. It is of no importance to fisheries.

**Distribution:** *Eurypharynx pelecanoioides* is currently considered to be a single cosmopolitan species. In the Atlantic, it occurs over a wide range of latitude, from Iceland in the north to 48°S.

### Reference

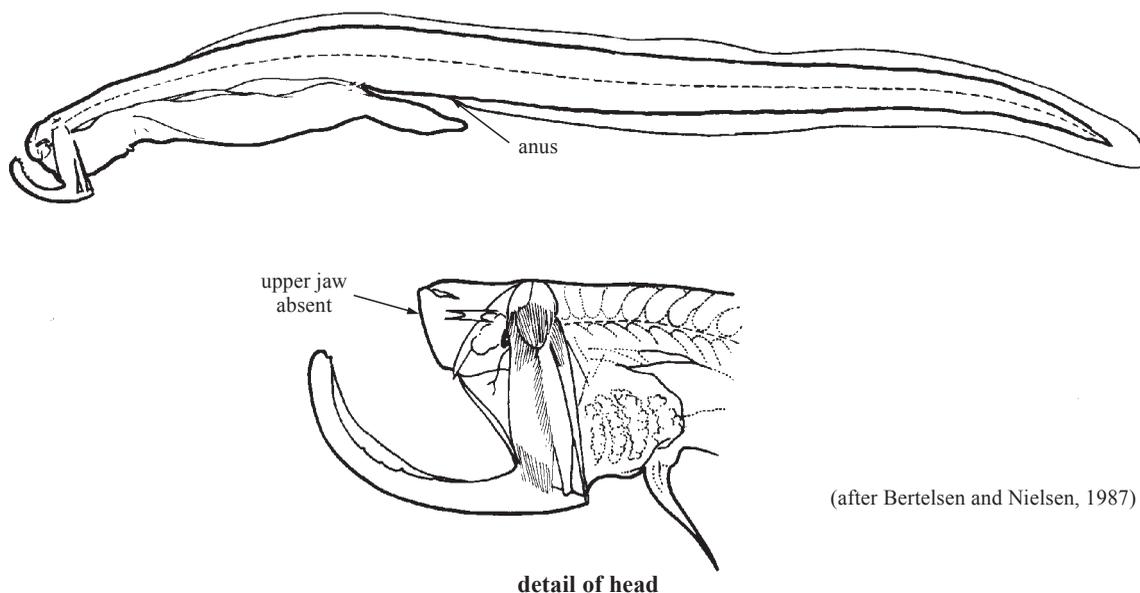
Nielsen, J.G., E. Bertelsen, and Å. Jespersen. 1989. The biology of *Eurypharynx pelecanoioides* (Pisces, Eurypharyngidae). *Acta Zoologica* (Stockholm), 70(3):187-197.

## MONOGNATHIDAE

### One-jawed eels

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

**Diagnostic characters:** Small, fragile fishes, maximum size 16 cm. Body short to moderate; tail moderate, not attenuate; anus near anterior 1/4 to 1/3 of total length; abdomen distensible, posterior part often protruding ventrally into a pouch that may extend behind anus. Head moderate; eye greatly reduced. Snout variable, from short to moderately elongate; olfactory organ reduced to a short tube between anterior and posterior nostrils. **Upper jaw (maxilla and palatopterygoid arcade) absent, lower jaw closes against bottom of neurocranium; lower jaw and suspensorium greatly prolonged;** lower jaw with a single series of small, conical teeth; **front of skull with a median, unpaired fang provided with a venom gland.** Dorsal and anal fins present, reaching tip of tail, may or may not be confluent around tip of tail; true caudal fin absent; dorsal fin begins at or before middle of trunk; pectoral fin absent or present as a dermal flap without rays. Scales absent. Lateral line absent. **Colour:** variable, from unpigmented to light or dark brown.



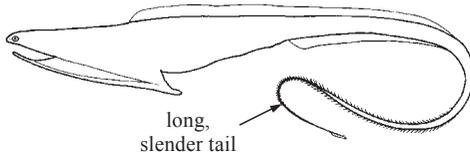
**Habitat, biology, and fisheries:** Monognathids are pelagic and live at great depths; most of the known specimens have been collected at 2 000 to 5 400 m, making them the deepest-living of all the pelagic eels and eel-like fishes. They appear to feed mainly on shrimp and can take relatively large prey; the venomous fang apparently is used to immobilize the prey and allow it to be swallowed. The single known mature male differs markedly from the females and immatures; the lower jaw is reduced to a rudiment, the rostral fang is short and blunt, the olfactory organs are greatly enlarged, the head is covered with a layer of spongy tissue, and the posterior dorsal- and anal-fin rays are lengthened just before the tip of the tail to form a notched tail fin. The reduction of the feeding apparatus indicates that the male stops feeding at maturity, and hence that spawning is the terminal event in its life. The enlarged olfactory organ and the broadened tail suggests that it locates its mate by following pheromone trails. Beyond this we know nothing about the biology of monognathids; indeed, their odd morphology and their near total lack of sense organs make it difficult to imagine how they function and survive in their environment. Monognathids are rare and of no importance to fisheries.

**Remarks:** Monognathids belong to an order characterized by the reduction and loss of many skeletal features, but they have carried these trends to bizarre lengths. The absence of an upper jaw is unique among fishes. They are small fishes; the largest specimen known is only 15.9 cm in total length, and most are less than 10 cm. Fourteen species are currently recognized. Although they can be divided into 2 groups based on the length of the snout and the shape of the skull, they are all considered to belong to a single genus, *Monognathus*.

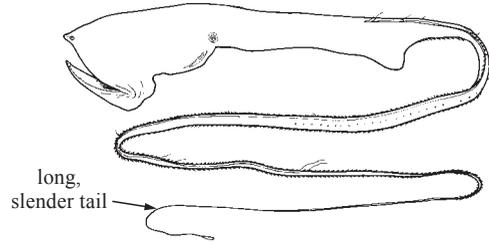
### Similar families occurring in the area

Eurypharyngidae: upper jaw present; tail long and slender, ending in a caudal organ.

Saccopharyngidae: upper jaw present; tail long and slender, ending in a caudal organ.



**Eurypharyngidae**



**Saccopharyngidae**

### List of species occurring in the area

This is a poorly known family, and the following list of species should be considered provisional. Only 1 species has actually been taken in the area, but 5 others are recorded from the eastern Atlantic. Any of these might be present. Additional, undescribed species may be found in the future.

*Monognathus bertini* Bertelsen and Nielsen, 1987. NE Atlantic and SW Pacific.

*Monognathys boehlkei* Bertelsen and Nielsen, 1987. Bermuda, also NE Atlantic.

*Monognathus herringi* Bertelsen and Nielsen, 1987. NE Atlantic.

*Monognathus jespersenii* Bertin, 1936. NE Atlantic.

*Monognathus nigeli* Bertelsen and Nielsen, 1987. NE Atlantic

*Monognathus tanningi* Bertin, 1936. NE Atlantic.

### Reference

Bertelsen, E. and J. Nielsen. 1987. The deepsea eel family Monognathidae (Pisces, Anguilliformes). *Steenstrupia*, 13(4):141-198.