

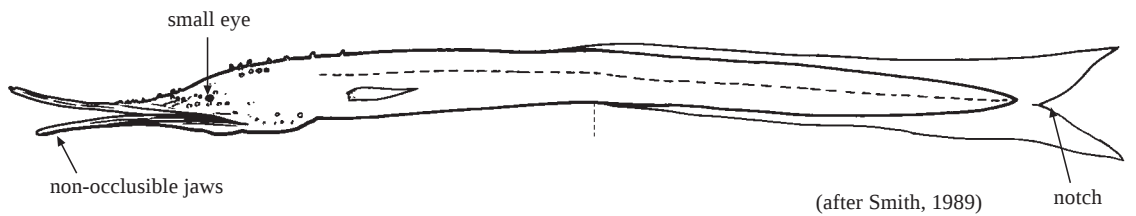
Order SACCOPHARYNGIFORMES

CYEMATIDAE

Bobtail eels

by D.G. Smith

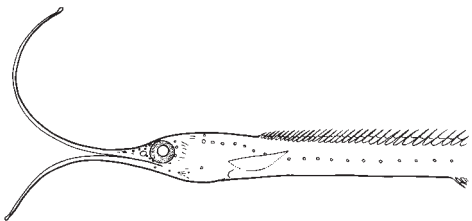
Diagnostic characters: Body short and stubby, anus at or slightly behind midlength. Eye small. Jaws long and slender, diverging toward tips, forming a non-occlusible beak; gape of mouth extends well behind eye. Anterior and posterior nostrils close together, immediately in front of eye; anterior nostril 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 fins 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. Two genera are known, each with a single recognized species. *Cyama atrum* is the most common and occurs in all oceans. *Neocyema erythrosoma* is known only from the South Atlantic.

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.



Nemichthyidae

List of species occurring in the area

Cyama atrum Günther, 1878 is the only species that has been collected in the area as an adult. Several distinct kinds of leptocephali are known, however, indicating that more than 1 species of cyematid is present. *Neocyema erythrosoma* Castle, 1977 was described from the South Atlantic, but it could be present in the Indo-Pacific as well.

References

Bertin, L. 1937. Les poissons abyssaux du genre *Cyema* Günther (anatomie, embryologie, bionomie). *Dana Rept.*, (10):30 p.

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

Smith, D.G. and M.J. Miller. 1996. Cyematid larvae of the *Leptocephalus holti* group in the Atlantic and Pacific Oceans (Pisces: Saccopharyngiformes). *Breviora*, 503:1-12.

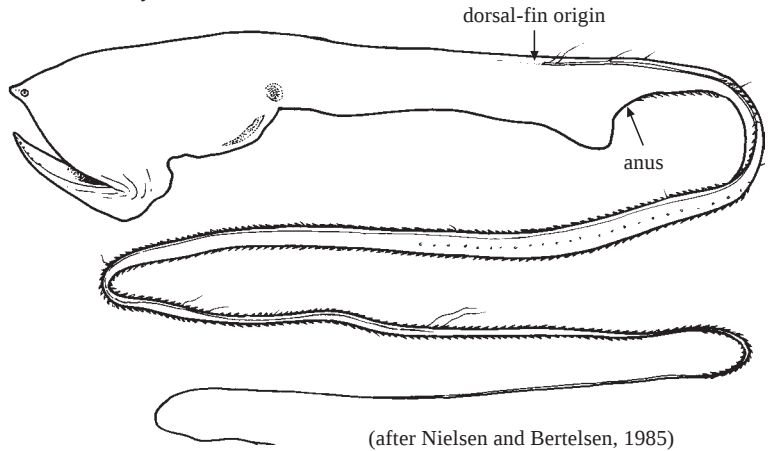
SACCOPHARYNGIDAE

Swallower eels

by D.G. Smith

Diagnostic characters:

Body very elongate; tail attenuated and ending in an expanded caudal organ of variable structure, often luminous; anus near anterior third to fifth 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 fins 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.

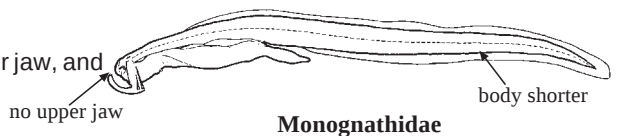
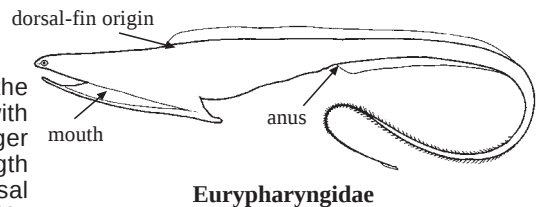
Remarks: The Saccopharyngidae is 1 of 3 families of highly modified, midwater eels commonly known as gulpers; the others are the Eurypharyngidae and Monognathidae. Gulpers are characterized by the reduction and loss of many skeletal elements. Their precise relationship to the other eels is still uncertain, but they are usually placed in a separate order, the Saccopharyngiformes. The Saccopharyngidae contains a single genus, *Saccopharynx*.

Similar families occurring in the area

Eurypharyngidae: *Eurypharynx*, the single genus in the 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.



List of species occurring in the area

Nine species are currently recognized in the Saccopharyngidae, but none of them have been recorded from the area. However, this undoubtedly reflects inadequate sampling rather than actual absence. Until more collections have been made and examined, we will not know which species occur in the Western Central Pacific. *Saccopharynx schmidtii* Bertin, 1934 has been taken off the east coast of Australia, just south of the area. *S. lavenbergi* Nielsen and Bertelsen, 1985 occurs in the eastern Pacific, and *S. ramosus* Nielsen and Bertelsen, 1985 has been recorded from the western Indian Ocean. The remaining species are known from the Atlantic.

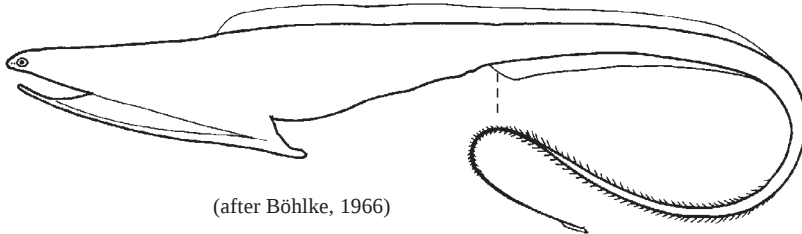
Reference

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

A single species in this family.*Eurypharynx pelecانoides* Vaillant, 1882**Frequent synonyms / misidentifications:** *Gastrostomus bairdii* Gill and Ryder, 1883; *G. pacificus* Bean, 1904 / None.**FAO names:** En - Gulper eel.

Distinctive characters: Body elongate, tail attenuated and ending in an expanded, luminous caudal organ; anus near anterior 1/3 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 fins rudimentary. A pair of white lines or grooves, one on each side of dorsal fin, of uncertain function. Scales absent. Lateral line without pores, instead with groups of elevated tubules. **Colour:** black, without markings.

Similar families occurring in the area

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 forty percent or less of the preanal length. The teeth are larger, and the dorsal fin begins over or slightly in front of the anus.

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

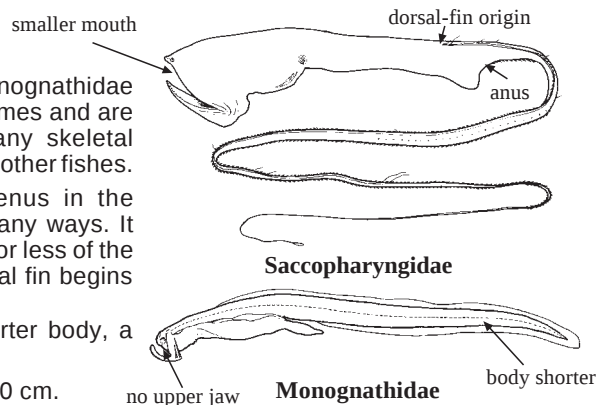
Size: Maximum total length approximately 70 to 80 cm.

Habitat, biology, and fisheries: *Eurypharynx* is of no importance to fisheries. It 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. *Eurypharynx pelecانoides* lives pelagically at depths of 500 to 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. Male *Eurypharynx* undergo pronounced morphological changes at maturity: the olfactory organs enlarge, the jaws degenerate, and the teeth are reduced or lost. Females remain relatively unchanged.

Distribution: Worldwide in tropical and temperate seas.

References

- Böhlke, J.E. 1966. Order Lyomeri. In *Fishes of the Western North Atlantic*, Part 5, edited by G.W. Mead. *Mem. Sears Found. Mar. Res.*, 1(5):603-628.
- Nielsen, J.G., E. Bertelsen, and A. Jespersen. 1989. The biology of *Eurypharynx pelecانoides* (Pisces, Eurypharyngidae). *Acta Zoologica (Stockholm)*, 70(3):187-197.

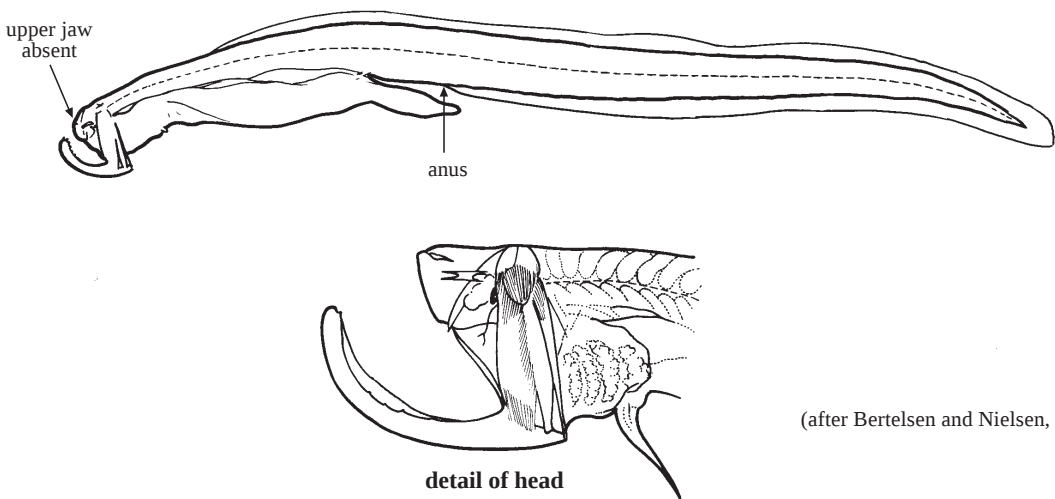


MONOGNATHIDAE

Monognathids

by D.G. Smith

Diagnostic characters: 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 fins absent or present as a demal flap without rays. Scales absent. Lateral line absent. **Colour:** variable, from unpigmented to light or dark brown.



(after Bertelsen and Nielsen, 1987)

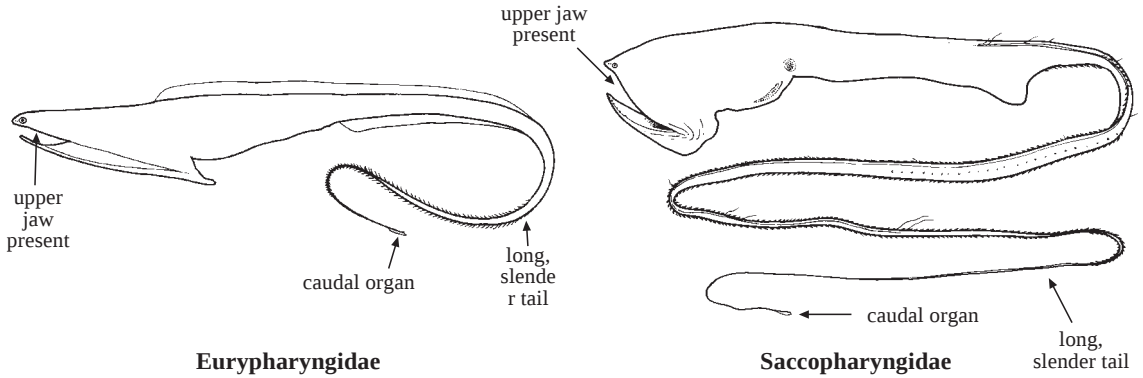
Habitat, biology, and fisheries: Monognathids are pelagic and live at great depths; most of the known specimens have been collected at 2 000 to 5 400 m, making them the deepest-living of all the pelagic eels and eel-like fishes. They appear to feed mainly on shrimp and can take relatively large prey; 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 of no importance to fisheries.

Remarks: Monognathids belong to the order Saccopharyngiformes, which is 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.



List of species occurring in the area

Note: this is a poorly known family, and the following list of species should be considered provisional. Only 2 species have actually been taken in the area, but 9 are recorded from the Indo-Pacific. Any of these might be present. Additional, undescribed species may be found in the future.

- Monognathus ahlstromi* Raju, 1974
- Monognathus bertini* Bertelsen and Nielsen, 1987
- Monognathus brunni* Bertin, 1936
- Monognathus isaacsi* Raju, 1974
- Monognathus jesse* Raju, 1974
- Monognathus ozawai* Bertelsen and Nielsen, 1987
- Monognathus rajui* Bertelsen and Nielsen, 1987
- Monognathus rosenblatti* Bertelsen and Nielsen, 1987
- Monognathus smithi* Bertelsen and Nielsen, 1987

Reference

Bertelsen, E. and J.G. Nielsen. 1987. The deep-sea eel family Monognathidae. *Steenstrupia*, 13(4):141-198.