

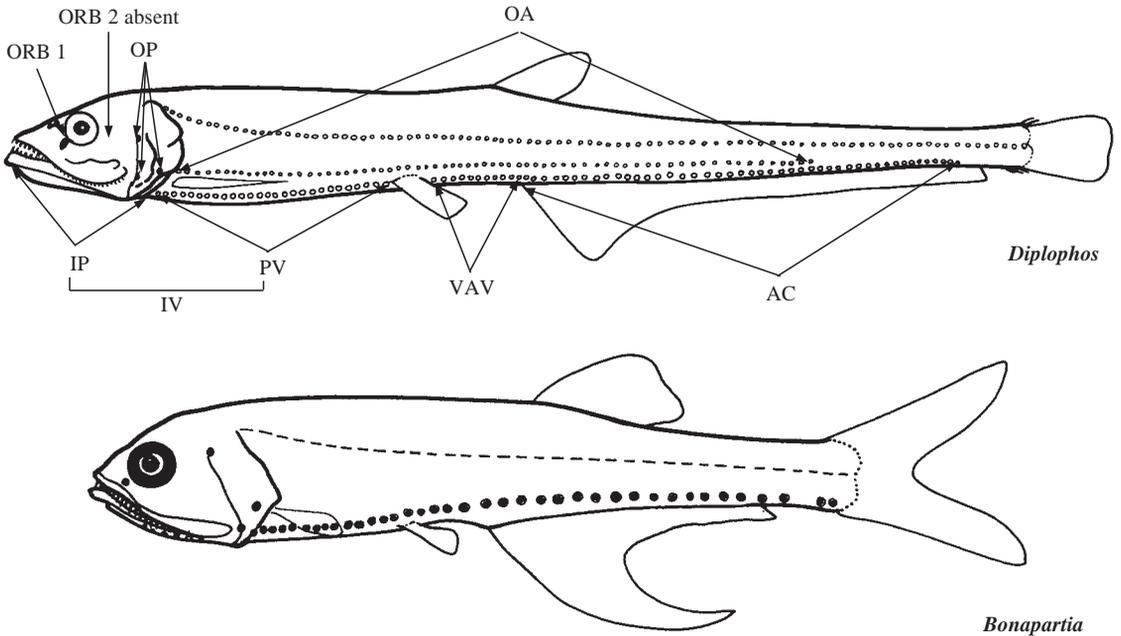
Order STOMIIFORMES

GONOSTOMATIDAE

Bristlemouths

by A.S. Harold

Diagnostic characters: Body moderately elongate (to about 36 cm standard length); head and body compressed. Relative size of head highly variable. Eye very small (*Cyclothone*) to moderately large (*Margrethia*). Nostrils high on snout, prominent in dorsal view. Mouth large, angle of jaw well posterior to eye. Premaxillary teeth uniserial (except in *Triplophos*); dentary teeth biserial near symphysis. **Chin barbel absent.** Gill openings very wide. Branchiostegals 12 to 16 (4 to 6 on posterior ceratohyal). **Gill rakers well developed.** Pseudobranchiae usually absent (present in *Diplophos* and *Margrethia*). **Dorsal fin at or slightly posterior to middle of body (except in *Triplophos* in which it is anterior).** Anal-fin base moderately to very long. Dorsal fin with 10 to 20 rays; anal fin with 16 to 68 rays; caudal fin forked; pectoral-fin rays 8 to 16; pelvic-fin rays 5 to 9. Dorsal adipose fin present or absent; ventral adipose fin absent. Scales deciduous. One or more rows of discrete photophores on body; BR 7-16; OA 0-77; IV 11-51; VAV 3-17; AC 12-51; **isthmus photophores (IP) present or absent; posterior orbital photophore (ORB 2) absent.** Parietals well developed; epioccipitals separated by supraoccipital. Four pectoral-fin radials (except *Cyclothone*, which has 1). **Colour:** skin varying from colourless through brown to black; black and silvery pigmentation associated with photophores.



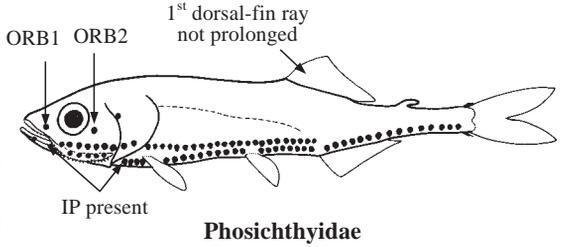
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|---|---|
| AC - ventral series posterior to anal-fin origin | OP - opercular photophores |
| BR - on the branchiostegal membranes | ORB - anterior (ORB 1) and posterior (ORB 2) to eye |
| IP - ventral series anterior to pectoral-fin base | PV - ventral series between bases of pectoral and pelvic fins |
| IV - ventral series anterior to pelvic-fin base | VAV - ventral series between pelvic-fin base and origin of anal fin |
| OA - lateral series | |

abbreviated terminology of photophores

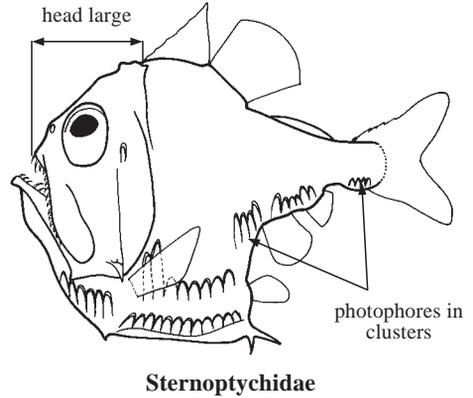
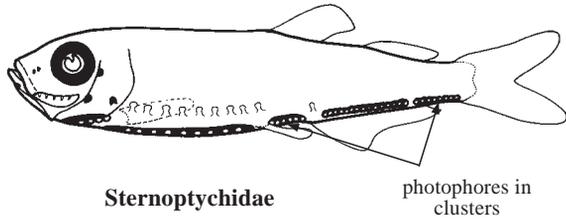
Habitat, biology, and fisheries: Mesopelagic and bathypelagic, oceanic. Development, especially of photophores, protracted. Diet consists of other fishes and crustaceans.

Similar families occurring in the area

Phosichthyidae: row of photophores on isthmus (IP); usually 2 orbital photophores, except posterior of the 2 (ORB 2 lacking in *Polymetme* and *Yarella*); photophores Gamma type; 3 bony pectoral-fin radials.

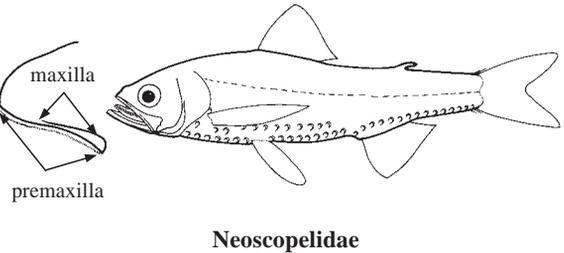
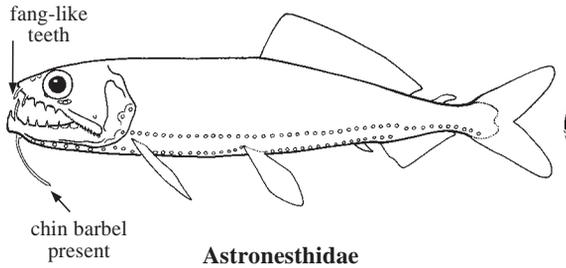


Sternoptychidae: moderately elongate to very deep-bodied; head large, more than 25% of standard length in many; pseudobranch present; ventral photophore series with disjunct clusters of 2 or more photophores; branchiostegal photophores (BR) 6 (rarely 7 in *Sonoda* which does not occur in the area); photophores Alpha type; 4 bony pectoral-fin radials.



Astronesthidae, Chauliodontidae, Idiacanthidae, Malacosteidae, Melanostomiidae, and Stomiidae: similar arrangement of photophores but body generally more elongate; chin barbel usually present (reduced or absent in Chauliodontidae, absent in males of Idiacanthidae, and absent in *Malacosteus* of the Malacosteidae); jaw teeth greatly enlarged, fang-like; gill rakers absent in adults; usually 3 bony pectoral-fin radials.

Myctophidae and Neoscopelidae (myctophiform families): also with photophores, but usually with a less elongate body and the maxilla is completely excluded from the gape by the premaxilla; ventral photophores usually more widely spaced and not arranged in such regular rows as in the Gonostomatidae.



Key to the genera of Gonostomatidae occurring in the area

Remarks on key characters: Gonostomatids are delicate and the skin and photophores are frequently damaged or lost during capture in commercial deep-water trawls. The genera are, however, distinct and therefore presence or absence of certain photophore groups, fin positions, and ray counts in conjunction with general body form will usually be adequate for identification.

- 1a. Anal-fin rays 36 to 39; dorsal-fin origin well in advance of anal-fin origin, posterior insertion of dorsal fin directly above or slightly anterior to anal-fin origin; photophores present on isthmus (IP) (Fig. 1); IV photophores 24 to 50 → 2
- 1b. Anal-fin rays 16 to 31; dorsal-fin origin not well in advance of anal-fin origin; photophores not present on isthmus (IP); IV photophores 13 to 17 → 4

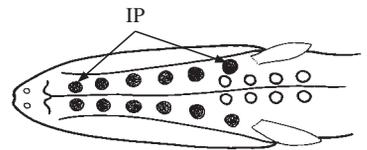


Fig. 1 ventral view of head

- 2a. VAV photophores 12 to 17 (Fig. 2); ORB photophore below or slightly ahead of anterior margin of eye; lower gill rakers 7 to 10; a row of small photophores present on posterior half of lower jaw; pseudobranchiae present; IV photophores 29 to 51 → 3
- 2b. VAV photophores 5 to 7 (Fig. 3); ORB photophore below centre of eye; lower gill rakers 12 to 16; no photophores present on posterior half of lower jaw; pseudobranchiae absent; IV photophores 24 to 30; dorsal fin well anterior to middle of body *Triplophos* Brauer, 1902

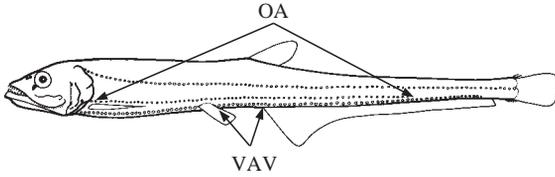


Fig. 2 *Diplophos*

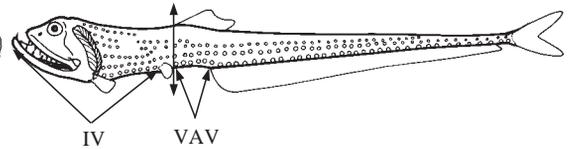


Fig. 3 *Triplophos*

- 3a. OA photophores 60 to 77 (Fig. 2); IV photophores 31 to 51; AC photophores 76 to 119; IC photophores 28 to 39; distance from tip of snout to anal-fin origin usually about 47.5 to 51.2% standard length (61.2 to 64.4% standard length in *Diplophos rebainisi*) *Diplophos* Günther, 1873

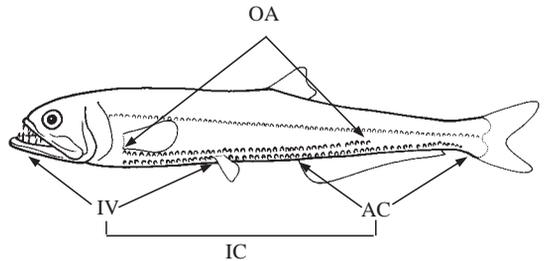


Fig. 4 *Manducus*

- 3b. OA photophores 45 to 48 (Fig. 4); IV photophores 29 to 33; AC photophores 28 to 39; IC photophores 69-86; distance from tip of snout to anal-fin origin about 59.0 to 63.0% standard length *Manducus* Goode and Bean, 1896

- 4a. Dorsal-fin origin anterior to anal-fin origin (Fig. 5); pseudobranchiae well developed *Margrethia* Jespersen and Tåning, 1919

- 4b. Dorsal-fin origin above or posterior to anal-fin origin (Fig. 6); pseudobranchiae inconspicuous or absent → 5

- 5a. Anal fin with elongate anterior rays (Fig. 6); OA photophores absent; pectoral-fin rays 14 to 16 *Bonapartia* Goode and Bean, 1896

- 5b. Anterior rays of anal fin not elongate; OA photophores present (6 to 16); pectoral-fin rays 7 to 13 → 6

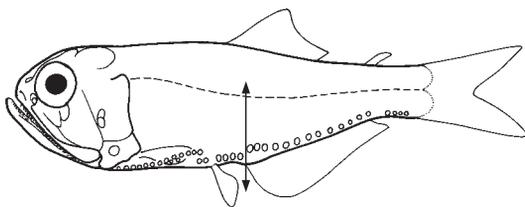


Fig. 5 *Margrethia*

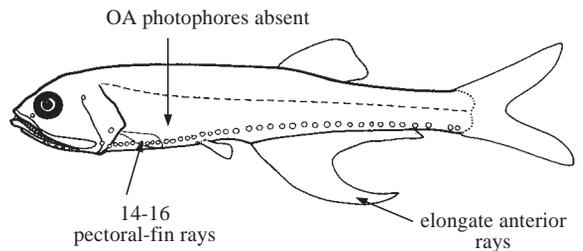


Fig. 6 *Bonapartia*

- 6a. Eyes moderate to small (Fig. 7a); OA photophores 11 to 21; SO photophore usually present (absent in *G. bathyphilum*); vertebrae 37 to 40; maxilla with a series of elongate, subequal teeth separated by a series of shorter, subequal teeth (Fig. 8a); palatine teeth in a single row; anal-fin rays 20 to 32 *Gonostoma* Rafinesque, 1810
- 6b. Eyes very small (Fig. 7b); OA photophores 6 to 10; SO photophore absent; vertebrae 29 to 33; maxillary teeth all short and subequal or with occasional slightly longer teeth distributed at roughly equal intervals (Fig. 8b); palatine teeth in an anterior patch; anal-fin rays 16 to 21 *Cyclothone* Goode and Bean, 1883

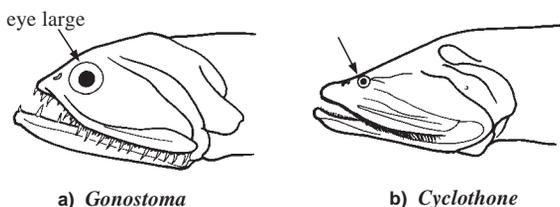


Fig. 7 head

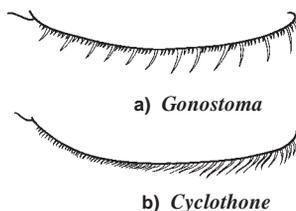


Fig. 8 teeth on maxilla (upper jaw)

List of species occurring in the area

- Cyclothone atraria* Gilbert, 1905
- Cyclothone braueri* Jespersen and Tåning, 1926
- Cyclothone kobayashii* Miya, 1994
- Cyclothone microdon* (Günther, 1878)
- Cyclothone obscura* Brauer, 1902
- Cyclothone pallida* Brauer, 1902
- Cyclothone parapallida* Badcock, 1982
- Cyclothone pseudopallida* Mukhacheva, 1964
- Cyclothone signata* Garman, 1899
- Diplophos australis* Ozawa, Oda, and Ida, 1990
- Diplophos orientalis* Matsubara, 1940
- Diplophos pacificus* Günther, 1889
- Diplophos taenia* Günther, 1873
- Gonostoma atlanticum* Norman, 1930
- Gonostoma bathyphilum* (Vaillant, 1888)
- Gonostoma ebelingi* Grey, 1960
- Gonostoma elongatum* Günther, 1878
- Gonostoma gracile* Günther, 1878
- Gonostoma longipinnis* Mukhacheva, 1972
- Manducus greyi* Johnson, 1970
- Margrethia obtusirostra* Jespersen and Tåning, 1919
- Triplophos hemingi* (McArdle, 1901)

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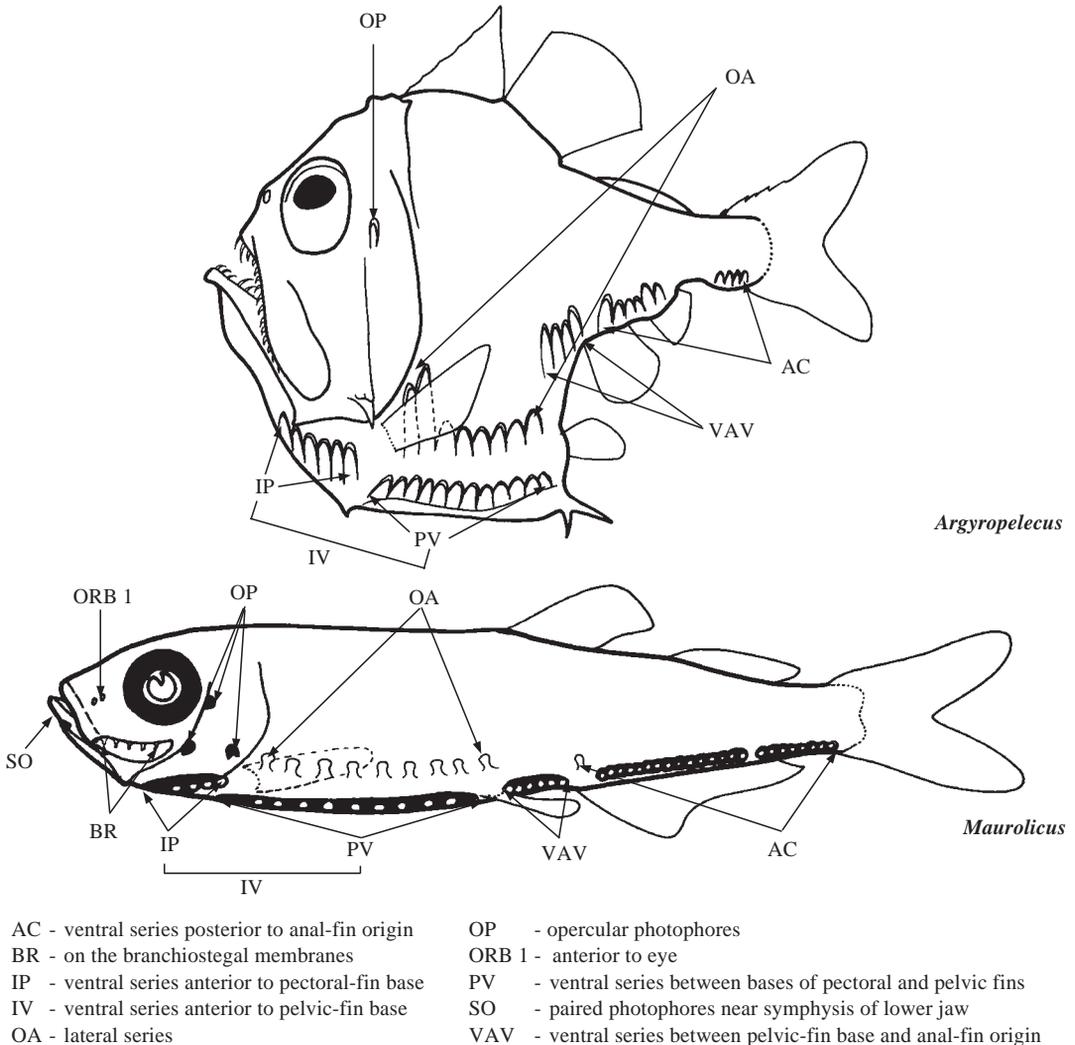
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- Paxton, J.R. and J.E. Hanley. 1989. Gonostomatidae. In *Zoological catalogue of Australia 7. Pisces: Petromyzontidae to Carangidae*, edited by J.R. Paxton, D.F. Hoese, G.R. Allen, and J.E. Hanley, pp. 183-186.
- Schaefer, S., R.K. Johnson, and J. Badcock. 1986. Gonostomatidae. In *Smiths' sea fishes*, edited by M.M. Smith and P.C. Heemstra. Johannesburg, Macmillan South Africa, pp. 247-253.

STERNOPTYCHIDAE

Hatchetfishes

by A.S. Harold

Diagnostic characters: Moderately elongate to deep-bodied (to about 10 cm standard length). Head moderate to very large, more than 1/3 of standard length in *Sternoptyx*. Eye large, up to about 1/2 of head length, directed vertically and telescopic in some *Argyropelecus* species. Snout short. Mouth small to moderate in size, terminal to dorsal oblique; jaw teeth generally small, some *Argyropelecus* species with well-developed canine teeth. Chin barbel absent. Branchiostegals 6 to 10. **Pseudobranch present.** Gill rakers well developed. Dorsal-fin origin usually near middle of body (anterior in *Danaphos*, posterior in *Araiophos*). Anal fin moderate to long-based, interrupted centrally by a group of photophores in some genera (e.g. *Argyripnus*, *Argyropelecus*, *Polyipnus*). Dorsal fin with 6 to 20 rays; anal fin with 17 to 38 rays; caudal fin forked; pectoral fin with 11 to 18 rays; pelvic fins with 5 to 7 rays. Dorsal adipose fin usually present; absent in *Araiophos eastropas* and *Polyipnus latirastrus*. Scales present, deciduous. **Ventral photophore series with disjunct clusters of 2 or more photophores.** Two ventrolateral rows of photophores on body; OA 0-10; IV 10-24; VAV 3-32; AC 3-51; paired row of photophores on isthmus (IP); branchiostegal photophores 6 (7 in *Sonoda*); 1 orbital photophore present (ORB 1); posterior orbital photophore (ORB 2) absent (present in most Phosichthyidae). **Three branchiostegal rays originating on posterior ceratohyal.** Four pectoral-fin radials. Photophores Alpha type. **Colour:** skin light to dark brown, often with reflective guanine pigment on side of body; silvery and black pigmentation usually associated with photophores. Some species with dark dorsum pigment and/or with saddle-like markings and lateral bars or incomplete stripes (*Polyipnus*).



Argyropelecus

Maurolicus

AC - ventral series posterior to anal-fin origin
 BR - on the branchiostegal membranes
 IP - ventral series anterior to pectoral-fin base
 IV - ventral series anterior to pelvic-fin base
 OA - lateral series

OP - opercular photophores
 ORB 1 - anterior to eye
 PV - ventral series between bases of pectoral and pelvic fins
 SO - paired photophores near symphysis of lower jaw
 VAV - ventral series between pelvic-fin base and anal-fin origin

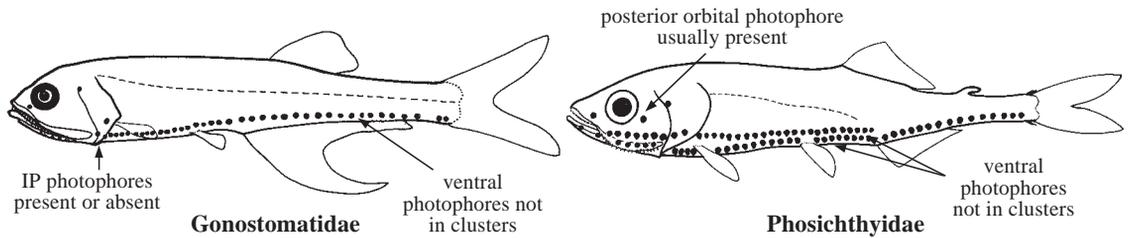
abbreviated terminology of photophores

Habitat, biology, and fisheries: Mainly mesopelagic as adults, occasionally bathypelagic or benthopelagic (*Argyripnus*, *Sonoda*, *Polyipnus*). Development, especially of photophores, protracted. Diet consists of small fishes and zooplankton, including crustaceans, annelids, chaetognaths, and molluscs.

Similar families occurring in the area

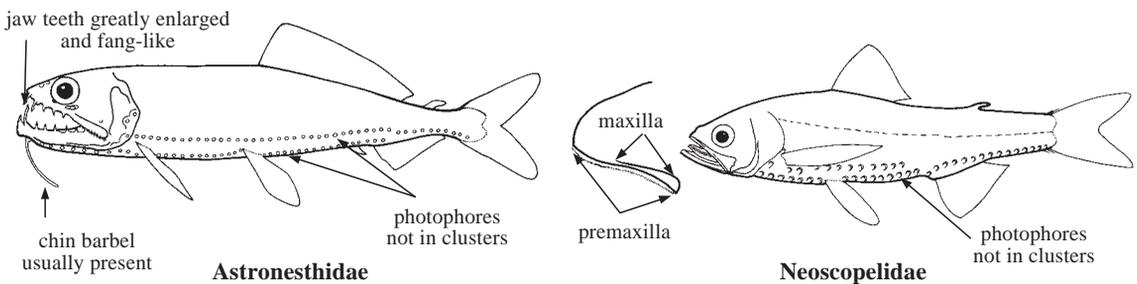
Gonostomatidae: pseudobranchiae usually absent (present in *Diplophos* and *Margrethia*); photophores type *Beta*; photophores present on isthmus (IP) or absent (*Bonapartia*, *Cyclothone*, *Gonostoma*, and *Margrethia*); ventral photophore series (IC) not in clusters.

Phosichthyidae: pseudobranchiae absent, except *Woodsia meyerwardeni*; photophores *Gamma* type; usually two orbital photophores, except posterior of the 2 (ORB 2) lacking in *Polymetme* and *Yarella*; ventral photophore series not in clusters; 3 bony pectoral-fin radials.



Astronesthidae, Chauliodontidae, Idiacanthidae, Malacosteidae, Melanostomiidae, and Stomiidae: similar arrangement of photophores but not in clusters; body generally more elongate, sometimes eel-like; chin barbel usually present (reduced or absent in Chauliodontidae, absent in males of Idiacanthidae, and absent in *Malacosteus* of the Malacosteidae); jaw teeth greatly enlarged, fang-like; gill rakers absent in adults; usually 3 bony pectoral-fin radials.

Myctophidae and Neoscopelidae (myctophiform families): also with photophores but the maxilla is completely excluded from the gape by the premaxilla; ventral photophores are usually more widely spaced and not in clusters.



List of species occurring in the area

Araiophos eastropas Ahlstrom and Moser, 1969

Argyripnus brocki Struhsaker, 1973

Argyripnus ehippiatus Gilbert and Cramer, 1897

Argyropelecus aculeatus Valenciennes, 1849

Argyropelecus affinis Garman, 1899

Argyropelecus gigas Norman, 1930

Argyropelecus hemigymnus Cocco, 1829

Argyropelecus sladeni Regan, 1908

Maurolicus australis Hector, 1875

Maurolicus imperitorius Parin and Kobylansky, 1993

Maurolicus javanicus Parin and Kobylansky, 1993

- Polyipnus aquavitus* Baird, 1971
Polyipnus asper Harold, 1994
Polyipnus danae Harold, 1990
Polyipnus elongatus Borodulina, 1979
Polyipnus fraseri Fowler, 1934
Polyipnus kiwiensis Baird, 1971
Polyipnus latirastrus Last and Harold, 1994
Polyipnus matsubarai Schultz, 1961
Polyipnus meteori Kotthaus, 1967
Polyipnus oluolus Baird, 1971
Polyipnus omphus Baird, 1971
Polyipnus ovatus Harold, 1994
Polyipnus parini Borodulina, 1979
Polyipnus paxtoni Harold, 1989
Polyipnus ruggeri Baird, 1971
Polyipnus soelae Harold, 1994
Polyipnus spinifer Borodulina, 1979
Polyipnus spinosus Günther, 1887
Polyipnus surugaensis Aizawa, 1990
Polyipnus tridentifer McCulloch, 1914
Polyipnus triphanos Schultz, 1938
Polyipnus unispinus Schultz, 1938

Sternoptyx diaphana Hermann, 1781
Sternoptyx obscura Garman, 1899
Sternoptyx pseudobscura Baird, 1971
Sternoptyx pseudodiaphana Borodulina, 1977

Thorophos euryops Bruun, 1931
Thorophos nexilis (Myers, 1932)

Valenciennellus tripunctulatus (Esmarck, 1871)

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- Baird, R.C. 1971. The systematics, distribution and zoogeography of the marine hatchetfishes (family Sternoptychidae). *Bull. Mus. Comp. Zool., Harvard Univ.*, 142:1-128.
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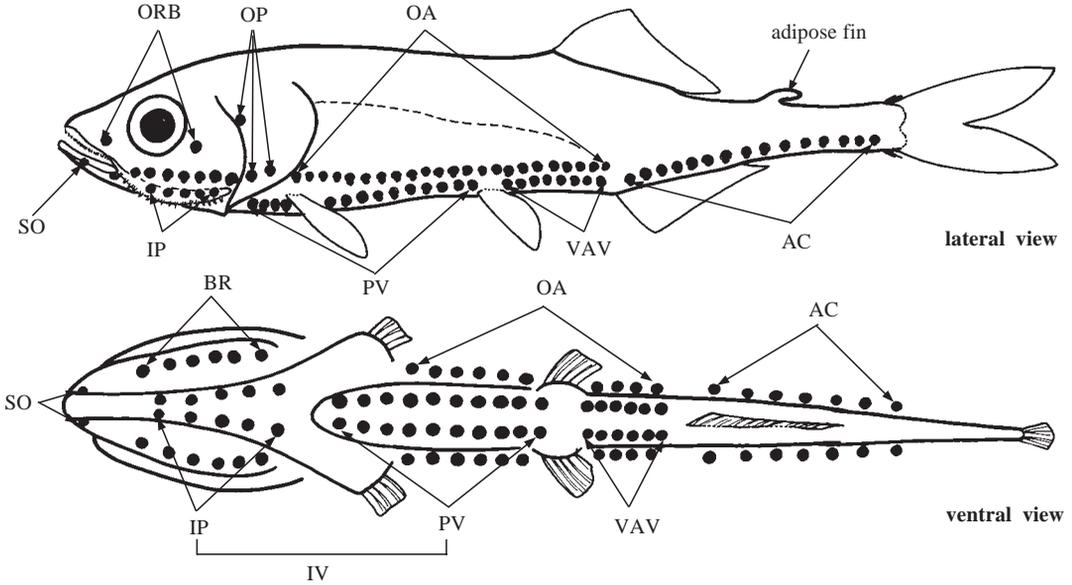
PHOSICHTHYIDAE

(= PHOTICHTHYIDAE)

Lightfishes (lighthousefishes)

by A.S. Harold

Diagnostic characters: Body generally moderately elongate (to about 30 cm standard length), somewhat deep-bodied in some *Ichthyococcus* species. Head and body compressed; head small to moderately large. Mouth large; premaxillary teeth uni- or biserial, dentary teeth biserial anteriorly, uniserial posteriorly; teeth ranging in size from small to large but not highly elongate and fang-like. **Chin barbel absent.** Eleven to 22 branchiostegal rays, 4 to 7 on posterior ceratohyal. **Gill rakers well developed (true gill rakers restricted to angle of arch in *Woodsia*).** Pseudobranchiae absent, except *Woodsia meyerwaardeni*. **Dorsal fin usually near middle of body, its origin well in advance of anal-fin origin (except *Pollichthys* which has the dorsal-fin origin immediately above that of the anal fin).** Anal fin with a moderately long base but terminating posteriorly ahead of the most constricted portion of caudal peduncle. Dorsal fin with 10 to 16 rays; anal fin with 12 to 33 rays; caudal fin forked; pectoral-fin rays 7 to 11; pelvic-fin rays 6 to 8. **Dorsal adipose fin present (except *Yarrella*).** Scales present, deciduous. Two ventrolateral rows of well-developed photophores on body, rows of accessory photophores dorsal to main rows in *Yarrella*; OA 17-53; IV 19-28; VAV 7-17; AC 12-28; **row of photophores on isthmus (IP); 2 orbital photophores (ORB), except *Polymetme* and *Yarrella* which lack the posterior ORB 2.** Three pectoral-fin radials. Usually 2 supramaxillae. Gamma type photophores; serial photophores with a lumen and a duct. **Colour:** skin varying from light brown in *Pollichthys* to dark brown or nearly black in *Yarrella*, scales of dorsum often outlined with dark pigment.



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BR - on the branchiostegal membranes
IP - ventral series anterior to pectoral-fin base
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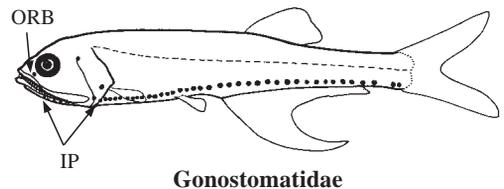
OP - opercular photophores
ORB - anterior (ORB 1) and posterior (ORB 2) to eye
PV - ventral series between bases of pectoral and pelvic fins
SO - paired photophores near symphysis of lower jaw
VAV - ventral series between pelvic-fin base and anal-fin origin

abbreviated terminology of photophores

Habitat, biology, and fisheries: Mesopelagic and bathypelagic adults (*Yarrella* and *Polymetme* may be benthopelagic). Larvae nearer surface than adults. Diet consists mainly of zooplankton, crustaceans in particular.

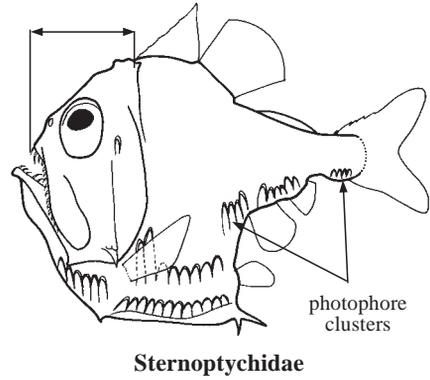
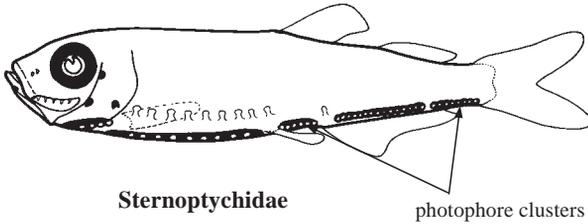
Similar families occurring in the area

Gonostomatidae: photophores Beta type; photophores present on isthmus (IP) (*Diplophos*, *Manducus* and *Triplophos*) or absent (*Bonapartia*, *Cyclothone*, *Gonostoma* and *Margrethia*); posterior orbital (ORB 2) photophore absent; 4 bony pectoral-fin radials.



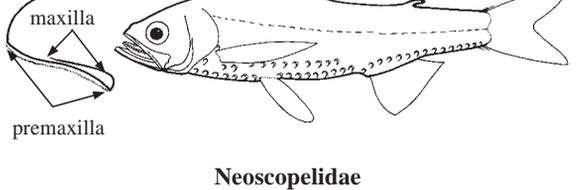
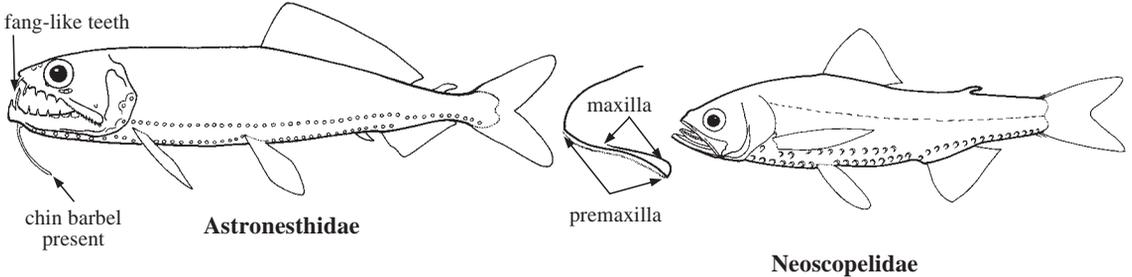
Gonostomatidae

Sternoptychidae: moderately elongate to very deep-bodied; head large, more than 25% standard length in many; pseudobranch present; photophores Alpha type; ventral photophore series with clusters of 2 or more photophores; posterior orbital photophore (ORB 2) absent; 4 bony pectoral-fin radials.



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Myctophidae and Neoscopelidae (myctophiform families): also with photophores, but usually with a less elongate body and the maxilla is completely excluded from the gape by the premaxilla; ventral photophores are usually more widely spaced and not arranged in such regular rows as in the Phosichthyidae.



List of species occurring in the area

- Ichthyococcus elongatus* Imai, 1941
- Ichthyococcus intermedius* Mukhacheva, 1980
- Ichthyococcus ovatus* (Cocco, 1838)
- Phosichthys argenteus* Hutton, 1873
- Pollichthys maui* (Poll, 1953)
- Polymetme corythaeola* (Alcock, 1898)
- Polymetme elongata* (Matsubara, 1938)
- Polymetme surugaensis* (Matsubara, 1943)
- Vinciguerria attenuata* (Cocco, 1838)
- Vinciguerria lucetia* (Garman, 1899)
- Vinciguerria nimbaria* (Jordan and Williams, 1896)
- Vinciguerria poweriae* (Cocco, 1838)
- Woodsia nonsuchae* (Beebe, 1932)
- Woodsia nonsuchae* Grey, 1959

References

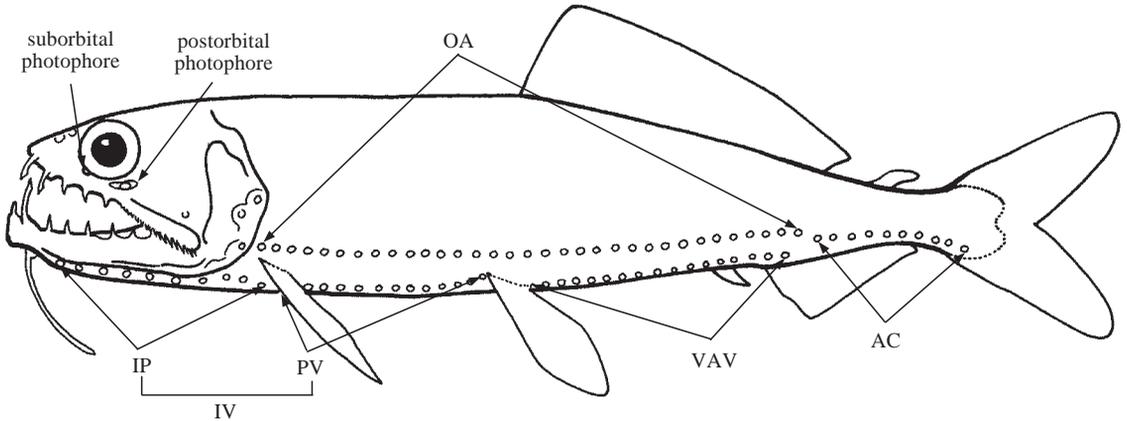
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ASTRONESTHIDAE

Snaggletooths (stareaters)

by A.S. Harold

Diagnostic characters: Body fusiform and slightly compressed (to about 21.5 cm standard length, commonly to 15 cm). Head moderately large, about 25% of standard length. Eye small, less than 1/4 of head length. Snout short to moderate, its length at most twice eye diameter. Mouth large with a small number of teeth ranging in size from small to large and fang-like. Vomerine and palatine teeth present. **Elongate chin barbel present;** terminal bulb present or absent. Branchiostegal rays 14 to 25. Gill rakers rudimentary in adults. **Dorsal fin usually near middle of body, its origin well in advance of anal-fin origin.** Anal fin terminating posteriorly on constricted portion of caudal peduncle. Dorsal fin with 9 to 21 rays; anal fin with 12 to 28 rays; caudal fin forked; pectoral fins with 6 to 9 rays; pelvic fins with 5 to 9 rays. **Dorsal adipose fin present (except in *Rhadinesthes*).** Scales absent, no hexagonal areas on body. Two ventrolateral rows of photophores on body; OA 11-56; IV 9-46; VAV 7-28; AC 6-18; **anterior portion of lower row (PV) curving upward at pelvic-fin base and appearing disjunct from posterior portion of row (VAV);** row of photophores on isthmus (IP); many small photophores covering much of body and head, their greatest concentration ventrally; suborbital photophore small, inconspicuous, located at anteroventral margin of eye; **postorbital photophore prominent, located posteroventrally to eye.** Three pectoral-fin radials. Stomach usually large and black, intestine originating near its anterior end; 1 or 2 pyloric caecae present. **Colour:** skin usually black, silvery pigmentation occasionally present on flank; **patches of luminous tissue on body in many species.**



AC - ventral series posterior to anal-fin origin
IP - ventral series anterior to pectoral-fin base
IV - ventral series anterior to pelvic-fin base

OA - lateral series
PV - ventral series between bases of pectoral and pelvic fins
VAV - ventral series between pelvic-fin base and origin of anal fin

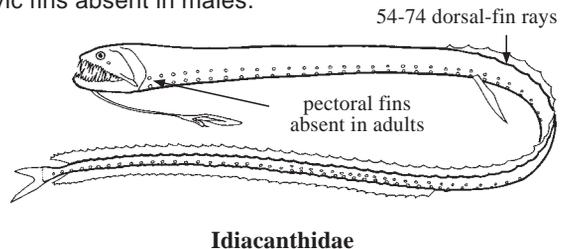
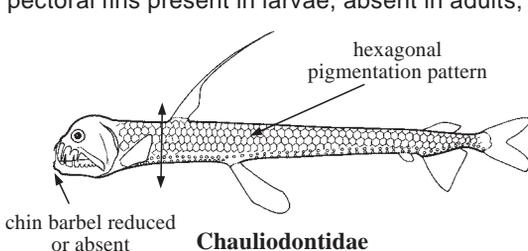
abbreviated terminology of photophores

Habitat, biology, and fisheries: Mainly mesopelagic adults (some species benthopelagic), juveniles have been caught at the surface at night. Diet consists of other mesopelagic fishes and crustaceans.

Similar families occurring in the area

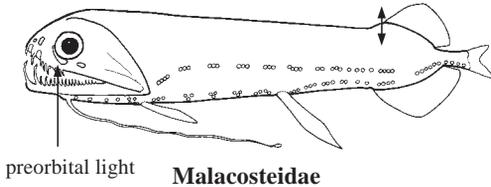
Chauliodontidae: body elongate, maximum depth at back of head; chin barbel short and simple, becoming reduced or absent in adults; dorsal fin well anterior, its origin between vertical through pectoral and pelvic fins, first ray prolonged; scale-like areas on body delineated by hexagonal pigmentation pattern.

Idiacanthidae: body highly elongate, eel-like; dorsal fin with very long base (54 to 74 rays), its origin well anterior to midbody; bases of dorsal- and anal-fin rays with a small sharp spur; dorsal adipose fin absent; pectoral fins present in larvae, absent in adults; pelvic fins absent in males.

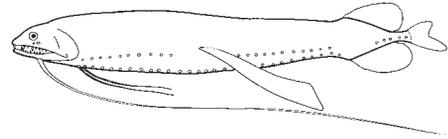


Malacosteidae: no membrane in floor of mouth; chin barbel present or absent; presence of a preorbital light organ, associated with suborbital organ (absent in *Photostomias*); dorsal fin located posteriorly, just ahead of caudal fin; dorsal adipose fin absent; pectoral fins absent or consisting of only free, filament-like rays.

Melanostomiidae: maxillae with erect teeth anteriorly and small, oblique denticles posteriorly; chin barbel present; dorsal fin located posteriorly, just ahead of caudal fin; dorsal adipose fin absent; pectoral fins present or absent; suborbital photophore absent.



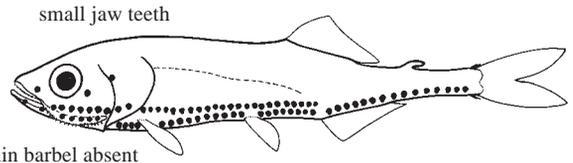
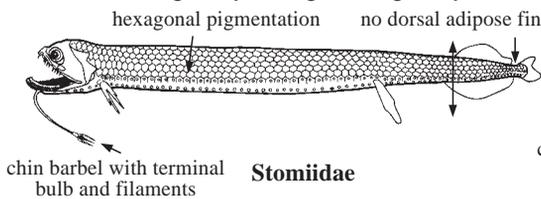
suborbital photophore absent dorsal adipose fin absent



Melanostomiidae

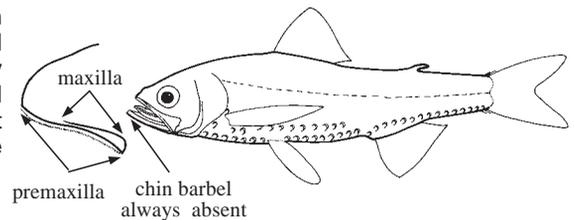
Stomiidae: body elongate and slender; chin barbel present, with terminal bulb and filaments; scale-like areas on body delineated by hexagonal pigmentation pattern; dorsal fin located posteriorly, just ahead of caudal fin; dorsal adipose fin absent.

Gonostomatidae, Phosichthyidae, and Sternoptychidae: these remaining stomiiform families often with somewhat similar body form and photophore arrangement, but have gill rakers as adults and lack both a chin barbel and greatly enlarged, fang-like jaw teeth.



Phosichthyidae

Myctophidae and Neoscopelidae (myctophiform families): also with photophores and often with similar body shape, but lack a chin barbel, have gill rakers as adults, and the maxilla is completely excluded from the gape by the premaxilla; ventral photophores usually more widely spaced and not arranged in such regular rows as in the Astronestidae.



Neoscopelidae

List of species occurring in the area

- Astronesthes boulengeri* Gilchrist, 1902
- Astronesthes chrysophekadion* (Bleeker, 1849)
- Astronesthes cyaneus* Brauer, 1902
- Astronesthes indicus* Brauer, 1902
- Astronesthes gemmifer* Goode and Bean, 1896
- Astronesthes leutkeni* Regan and Trewavas, 1929
- Astronesthes lucifer* Gilbert, 1905
- Astronesthes lupina* Whitley, 1941
- Astronesthes martensii* Klunzinger, 1871
- Astronesthes splendidus* Brauer, 1902
- Astronesthes trifibulatus* Gibbs, Amaoka, and Haruta, 1984
- Borostomias elucens* (Brauer, 1906)
- Borostomias mononema* (Regan and Trewavas, 1929)
- Heterophotus ophistoma* Regan and Trewavas, 1929
- Neonesthes capensis* Gilchrist and von Bonde, 1924
- Neonesthes microcephalus* Norman, 1930

Reference

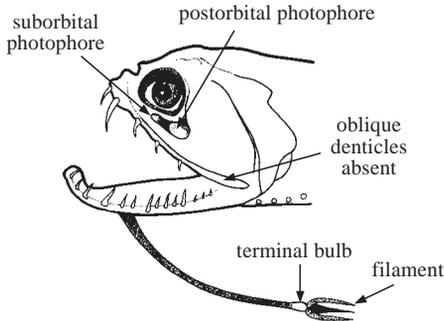
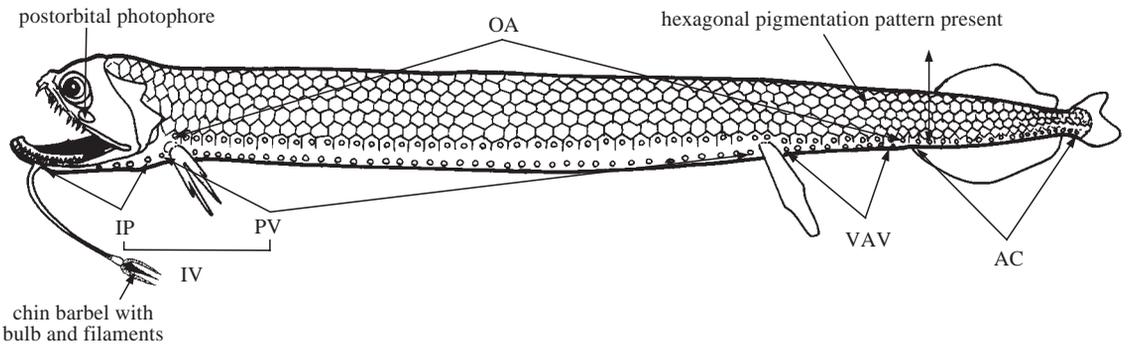
- Paxton, J.R. and J.E. Hanley. 1989. Astronesthidae. In *Zoological catalogue of Australia 7. Pisces: Petromyzontidae to Carangidae*, edited by J.R. Paxton, D.F. Hoese, G.R. Allen, and J.E. Hanley, pp. 94-196.

STOMIIDAE

Scaly dragonfishes

by A.S. Harold

Diagnostic characters: Body long and slender (to 41 cm standard length), covered by a gelatinous membrane with luminous inclusions in life. Head small. Mouth large, relative to head, with teeth ranging in size from small to moderately large and fang-like; posterior teeth of upper jaw (maxilla) not as small oblique denticles; jaws curved upward slightly. Chin barbel prominent, terminal bulb and filaments present. Branchiostegals 16 to 18. No well-developed gill rakers in adults. **Dorsal fin located well posteriorly just anterior to caudal fin, directly above anal fin.** Anal fin terminating posteriorly just anterior to constricted portion of caudal peduncle. Dorsal fin with 13 to 23 rays; anal fin with 15 to 25 rays; caudal fin forked or rounded; pectoral fins with 6 to 9 rays; pelvic fins with 4 or 5 rays. Dorsal adipose fin absent. Body covered with hexagonal scale-like areas. Two ventrolateral rows of photophores on body; OA 36-67 or 137-153; IV 41-64 or 89-99; VAV 5-16 or 58-67; AC 14-22; paired row of photophores on isthmus (IP); 1 or more small photophores associated with hexagonal scale-like areas; suborbital photophore small, inconspicuous, located at anteroventral margin of eye; postorbital photophore prominent, located posteroventrally to eye. **Colour: body scale rows delineated by a hexagonal pigmentation pattern.**



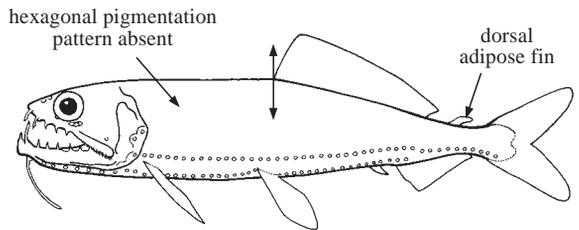
- AC - ventral series posterior to anal-fin origin
- IP - ventral series anterior to pectoral-fin base
- IV - ventral series anterior to pelvic-fin base
- OA - lateral series
- PV - ventral series between bases of pectoral and pelvic fins
- VAV - ventral series between pelvic-fin base and anal-fin origin

abbreviated terminology of photophores

Habitat, biology, and fisheries: Mainly mesopelagic (to 1 000 m) as adults, with some species bathypelagic, to 2 000 m. Migration to near surface at night in some species. Diet consists of other midwater fishes.

Similar families occurring in the area

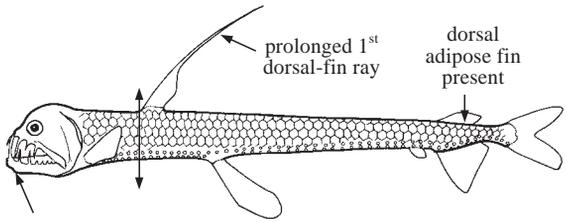
Astronesthidae: body fusiform and slightly compressed; chin barbel present, terminal bulb present or absent; dorsal fin near middle of body, its origin well ahead of anal-fin origin; dorsal adipose fin present; no hexagonal pigment areas on body; anterior portion of ventral photophore row (PV) curving upward at pelvic-fin base.



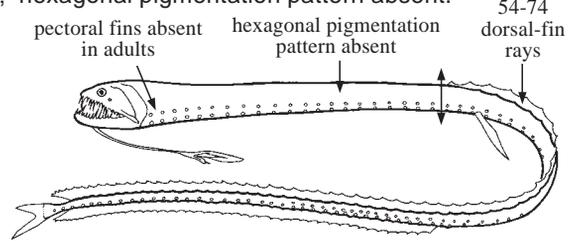
Astronesthidae

Chauliodontidae: only other stomiiform family with scale-like areas on body delineated by hexagonal pigmentation pattern; chin barbel short and simple, becoming reduced or absent in adults; dorsal fin well anterior, near head, first ray prolonged.

Idiacanthidae: body highly elongate, eel-like; dorsal fin with very long base (54 to 74 rays), its origin well anterior to midbody; bases of dorsal- and anal-fin rays with a small sharp spur; pectoral fins present in larvae, absent in adults; pelvic fins absent in males; hexagonal pigmentation pattern absent.



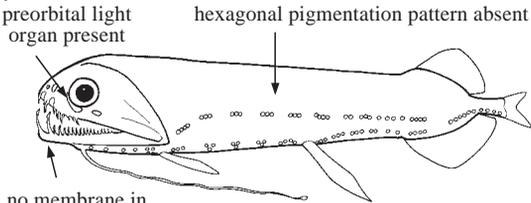
chin barbel reduced or absent in adults
Chauliodontidae



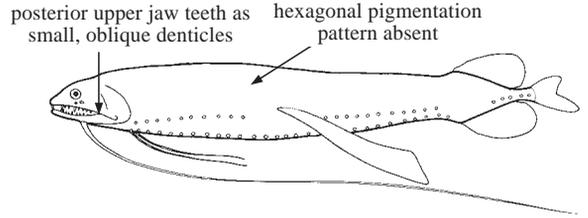
Idiacanthidae

Malacosteidae: no membrane in floor of mouth; chin barbel present or absent; presence of a preorbital photophore (absent in *Photostomias*); pectoral fins absent or consisting of only free, filament-like rays; hexagonal pigmentation pattern absent.

Melanostomiidae: maxillae with erect teeth anteriorly and small, oblique denticles posteriorly; chin barbel present, variable in length; pectoral fins present or absent; pelvic fins present; hexagonal pigmentation pattern absent.



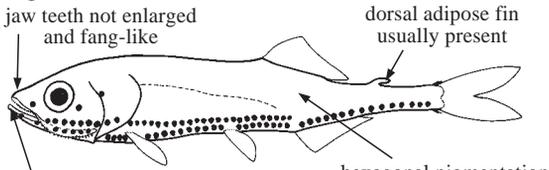
no membrane in floor of mouth
Malacosteidae



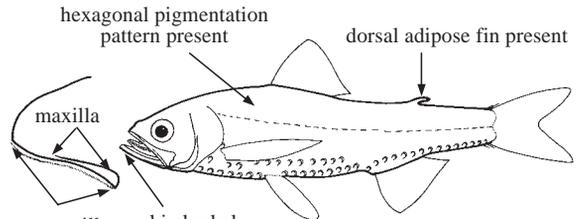
Melanostomiidae

Gonostomatidae, Phosichthyidae, and Sternoptychidae: these remaining stomiiform families often with somewhat similar body form and photophore arrangement, but have gill rakers as adults and lack the hexagonal pigmentation pattern, a chin barbel and enlarged, fang-like jaw teeth.

Myctophidae and Neoscopelidae (myctophiform families): also with photophores, but with a less elongate body, lack a chin barbel at all stages, have gill rakers as adults, and the maxilla is completely excluded from the gape by the premaxilla; ventral photophores usually more widely spaced and not arranged in such regular rows as in the Stomiidae.



chin barbel absent
Phosichthyidae



Neoscopelidae

List of species occurring in the area

- Stomias affinis* Günther, 1887
- Stomias boa* (Risso, 1810)
- Stomias danae* Ege, 1933
- Stomias longibarbatu*s (Brauer, 1902)
- Stomias nebulosus* Alcock, 1889

Reference

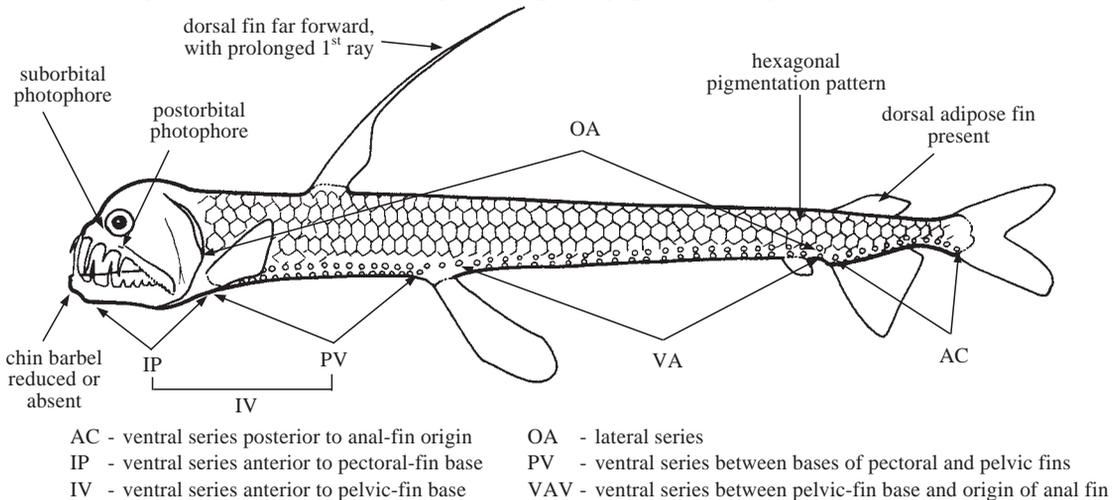
Paxton, J.R. and J.E. Hanley. 1989. Stomiidae. In *Zoological catalogue of Australia 7. Pisces: Petromyzontidae to Carangidae*, edited by J.R. Paxton, D.F. Hoese, G.R. Allen, and J.E. Hanley, pp. 206-207.

CHAULIODONTIDAE

Viperfishes

by A.S. Harold

Diagnostic characters: Body long, slender (to about 30 cm standard length), covered by a gelatinous membrane (usually lost during capture) with luminous inclusions, maximum depth of body at back of head. Head short and about as deep as long. Eye diameter about four times into head length. Snout short, its length less than eye diameter. **Mouth large with numerous very large teeth on premaxillae and dentary, some greatly elongated, fang-like and extending over front of head to above eye when mouth is closed;** posterior half of maxillae with numerous minute teeth. Vomerine teeth absent; palatine teeth present. **Chin barbel short and simple, becoming reduced or absent during development.** Branchiostegal rays 12 to 21. Gill rakers rudimentary, represented by tooth plates only. **Dorsal fin near head, its origin about half way between origin of pectoral and anal fins. First dorsal-fin ray greatly prolonged.** Anal fin located posteriorly, near caudal fin. Dorsal fin with 5 to 7 rays; anal fin with 10 to 13 rays; caudal fin forked; pectoral-fin rays 9 to 14; pelvic fin with 6 to 8 rays. **Dorsal and ventral adipose fins present.** Five longitudinal rows of scales covering body, delineated by a hexagonal pigmentation pattern. Two ventrolateral rows of photophores on body; OA 39-50; IV 25-34; VAV 22-30; AC 8-13; row of photophores on isthmus (IP); 1 or more small photophores associated with each hexagonal area on body; suborbital and postorbital photophores present. Premaxillae not protractile; epioccipitals well developed and lateral to supraoccipital; parietals minute. Anterior vertebrae unossified. Three pectoral-fin radials. **Colour: body scale rows delineated by a hexagonal pigmentation pattern.**



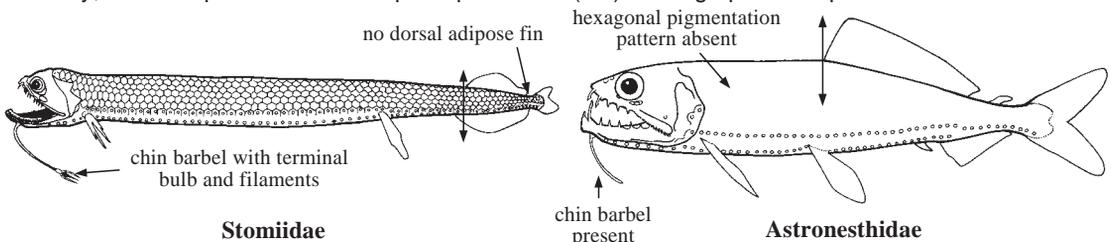
abbreviated terminology of photophores

Habitat, biology, and fisheries: Meso- to bathypelagic, to a maximum depth of 2 800 m, in open ocean; juveniles undergo vertical migration to near surface at night. Diet consists of other fishes and crustaceans.

Similar families occurring in the area

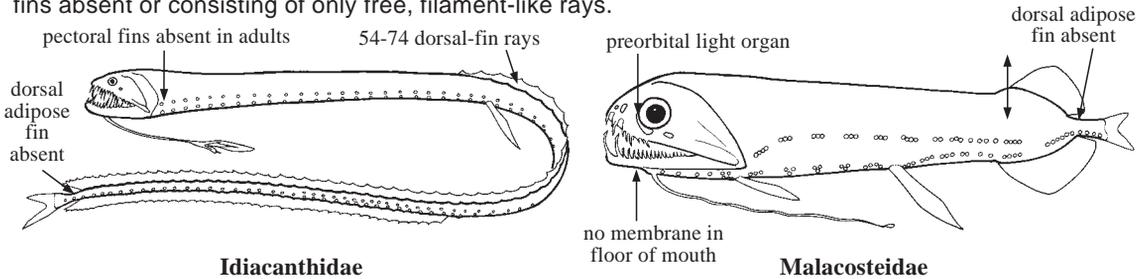
Stomiidae: only other stomiiform family with hexagonal pigmentation pattern; body more elongate and slender; chin barbel present, with terminal bulb and filaments; dorsal fin located posteriorly, just ahead of caudal fin; dorsal adipose fin absent.

Astronesthidae: body fusiform and slightly compressed; chin barbel present, terminal bulb present or absent; dorsal fin near middle of body, its origin well ahead of anal-fin origin; no hexagonal pigment areas on body; anterior portion of ventral photophore row (PV) curving upward at pelvic-fin base.



Idiacanthidae: body highly elongate, eel-like; hexagonal pigmentation pattern not present; chin barbel well-developed; dorsal fin with very long base (54 to 74 rays); bases of dorsal- and anal-fin rays with a small sharp spur; dorsal adipose fin absent; pectoral fins present in larvae, absent in adults; pelvic fins absent in males.

Malacosteidae: hexagonal pigmentation pattern not present on body; no membrane in floor of mouth; chin barbel present or absent; presence of a preorbital light organ, associated with suborbital organ (absent in *Photostomias*); dorsal fin located posteriorly, just ahead of caudal fin; dorsal adipose fin absent; pectoral fins absent or consisting of only free, filament-like rays.

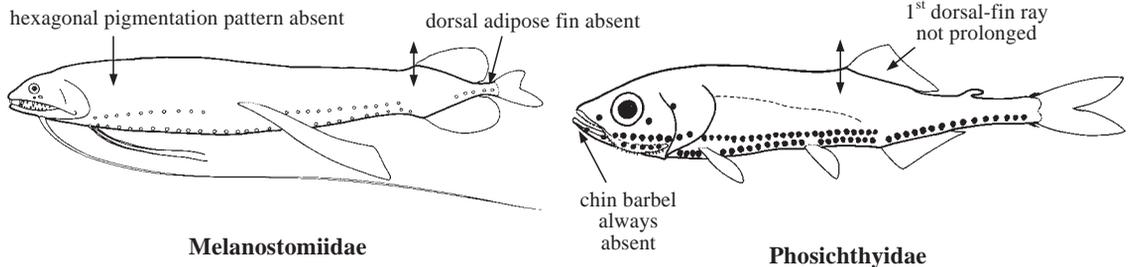


Idiacanthidae

Malacosteidae

Melanostomiidae: hexagonal pigmentation pattern not present on body; maxillae with erect teeth anteriorly and small, oblique denticles posteriorly; chin barbel present, variable in length; pectoral fins present or absent.

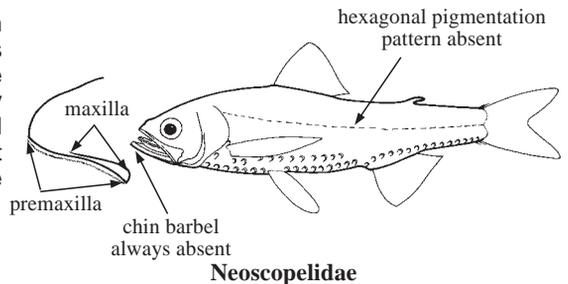
Gonostomatidae, Phosichthyidae, and Sternoptychidae: these remaining stomiiform families often with somewhat similar body form and photophore arrangement, but have gill rakers as adults and lack the hexagonal pigmentation pattern, a chin barbel and enlarged, fang-like jaw teeth.



Melanostomiidae

Phosichthyidae

Myctophidae and Neoscopelidae (myctophiform families): also with photophores, but with a less elongate body, lack a chin barbel at all stages, have gill rakers as adults, and the maxilla is completely excluded from the gape by the premaxilla; ventral photophores are usually more widely spaced and not arranged in such regular rows as in the Chauliodontidae.



Neoscopelidae

List of species occurring in the area

- Chauliodus barbatus* Garman, 1899
- Chauliodus danae* Regan and Trewavas, 1929
- Chauliodus dentatus* Garman, 1899
- Chauliodus sloani* Bloch and Schneider, 1801

References

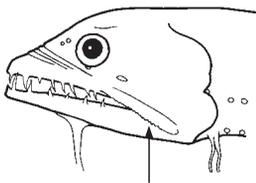
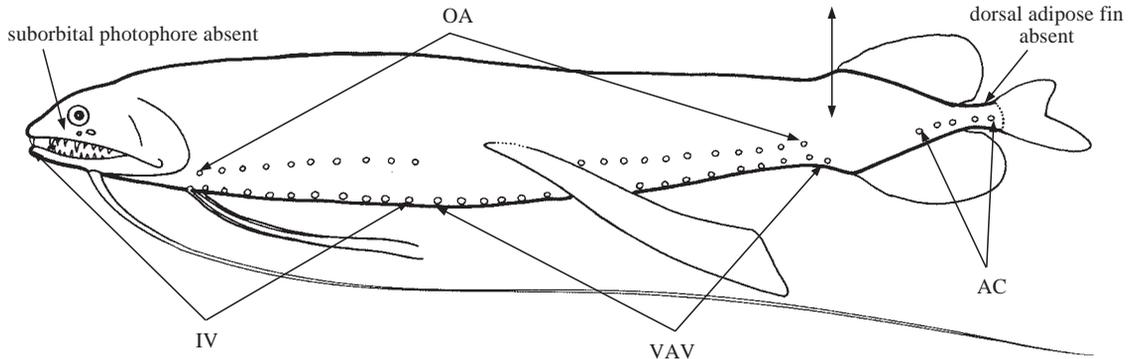
- Fujii, E. 1984. Family Chauliodontidae. In *Fishes of the Japanese Archipelago*, edited by H. Masuda, K. Amaoka, C. Araga, T. Uyeno, and T. Yoshino. Tokyo, Tokai University Press, pp. 48-49.
- Paxton, J.R. and J.E. Hanley. 1989. Chauliodontidae. In *Zoological catalogue of Australia 7. Pisces: Petromyzontidae to Carangidae*, edited by J.R. Paxton, D.F. Hoese, G.R. Allen, and J.E. Hanley, p. 205.

MELANOSTOMIIDAE

Scaleless dragonfishes (scaleless black dragonfishes)

by A.S. Harold

Diagnostic characters: Body elongate, slender (to about 50 cm standard length), slightly compressed (except *Bathophilus* in which the body is short and highly compressed). Head quite small. Jaws large, about equal to length of head; membrane connecting dentary bones forms floor of mouth. **Maxillae with erect teeth anteriorly and small, oblique denticles posteriorly.** Vomerine and palatine teeth present or absent. **Chin barbel present; ranging widely in length, with or without branches or terminal elaborations; sexually dimorphic in some taxa.** Branchiostegal rays 8 to 22. Gill rakers rudimentary, arches with series of tooth plates only. **Dorsal fin located well posteriorly just anterior to caudal fin, directly above anal fin.** Dorsal fin with 9 to 30 rays; anal fin with 9 to 46 rays; caudal fin small and forked; pectoral fins present or absent, 0 to 47 rays; pelvic fins present, usually with 7 rays, range 4 to 26. **Dorsal adipose fin absent (except in *Chirostomias*, which does not occur in the area).** Scales absent, no hexagonal areas on body. Two ventrolateral rows of prominent photophores on body (except in some *Bathophilus* species); OA 18-72; IV 16-62; VAV 11-24; AC 5-25; paired row of photophores on isthmus (IP); many small photophores covering much of body and head, often occurring in vertical rows associated with segments of body musculature; single row of photophores on caudal peduncle; preorbital photophore absent, except *Pachystomias*; **suborbital photophore absent; postorbital photophore usually present, located posteroventrally to eye, sometimes reduced or absent in females.** Anterior vertebrae at least slightly modified, allowing greater movement of head; highly reduced in some genera. Stomach long, moderately indistensible, usually pigmented; typically 2 pyloric caecae present. **Colour:** skin usually black, sometimes iridescent silver, bronze, or green.



small oblique denticles on posterior portion of maxilla (upper jaw)

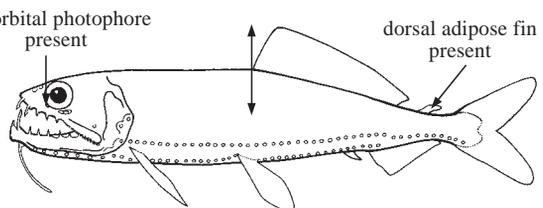
- AC - ventral series posterior to anal-fin origin
- IV - ventral series anterior to pelvic-fin base
- OA - lateral series
- VAV - ventral series between pelvic-fin base and anal-fin origin

abbreviated terminology of photophores

Habitat, biology, and fisheries: Mainly mesopelagic, occurring in the upper 1 000 m as adults, some species undergoing vertical migration to near surface at night. Specimens have been caught by open nets to depths of up to 4 500 m. Some species apparently benthopelagic as adults. Diet consists of other mesopelagic fishes and some crustaceans.

Similar families occurring in the area

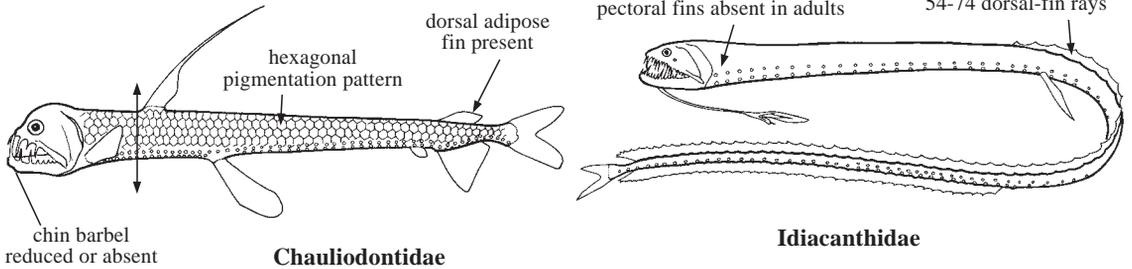
Astronesthidae: dorsal fin near middle of body, its origin well ahead of anal-fin origin; dorsal adipose fin present; anterior portion of ventral photophore row (PV) curving upward at pelvic-fin base; suborbital photophore present.



Astronesthidae

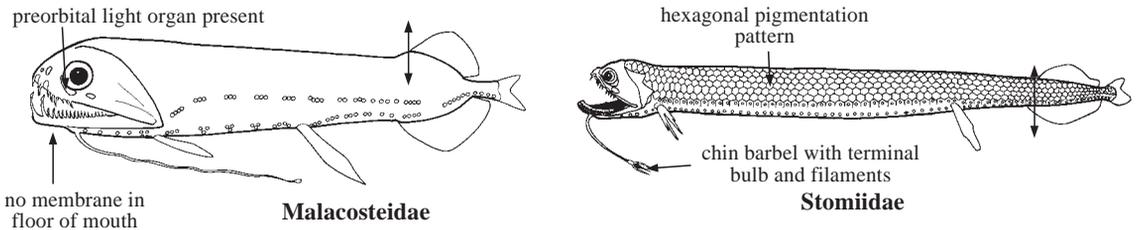
Chauliodontidae: chin barbel short and simple, becoming reduced or absent in adults; dorsal fin well anterior, near head, anterior ray prolonged; dorsal adipose fin present; pectoral and pelvic fins present; scale-like areas on body delineated by hexagonal pigmentation pattern.

Idiacanthidae: body highly elongate, eel-like; dorsal fin with very long base (54 to 74 rays), its origin well anterior to anal-fin origin; bases of dorsal- and anal-fin rays with a small sharp spur; pectoral fins present in larvae, absent in adults; pelvic fins absent in males.



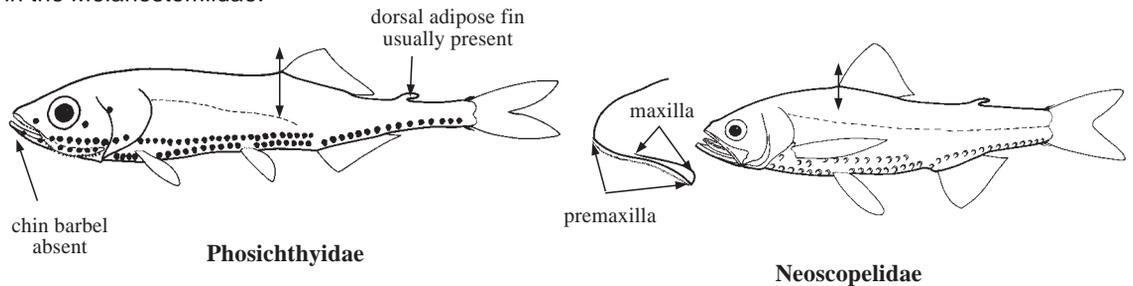
Malacosteidae: no membrane in floor of mouth; chin barbel present or absent; presence of a preorbital photophore (absent in *Photostomias*, present in the melanostomiid *Pachystomias*); pectoral fins absent or consisting of only free, filament-like rays.

Stomiidae: body elongate and slender; chin barbel present, with terminal bulb and filaments; posterior maxillary teeth not consisting of a series of small, oblique denticles; scale-like areas on body delineated by hexagonal pigmentation pattern; pectoral fins present.



Gonostomatidae, Phosichthyidae, and Sternoptychidae: these remaining stomiiform families often with somewhat similar body form and photophore arrangement, but have gill rakers as adults and lack both a chin barbel and greatly enlarged, fang-like jaw teeth.

Myctophidae and Neoscopelidae (myctophiform families): also with photophores, but with a less elongate body, lack a chin barbel, have gill rakers as adults, and the maxilla is completely excluded from the gape by the premaxilla; ventral photophores usually more widely spaced and not arranged in such regular rows as in the Melanostomiidae.



List of species occurring in the area

- Bathophilus abarbatatus* Barnett and Gibbs, 1968
- Bathophilus brevis* Regan and Trewavas, 1930
- Bathophilus digitatus* (Welsh, 1923)
- Bathophilus filifer* Garman 1899
- Bathophilus longipinnis* (Pappenheim, 1914)
- Bathophilus nigerrimus* Giglioli, 1884
- Bathophilus pawneeii* Parr, 1927

- Echiostoma barbatum* Lowe, 1843
Eustomias appositus Gibbs, Clarke, and Gomon, 1983
Eustomias achirus Parin and Pokhilskaya, 1974
Eustomias australensis Gibbs, Clarke, and Gomon, 1983
Eustomias bifilis Gibbs, 1960
Eustomias bimargaritoides Gibbs, Clarke, and Gomon, 1983
Eustomias bulbournatus Gibbs, 1960
Eustomias cancriensis Gibbs, Clarke, and Gomon, 1983
Eustomias cirritus Gibbs, Clarke, and Gomon, 1983
Eustomias crossotus Gibbs, Clarke, and Gomon, 1983
Eustomias dendriticus Regan and Trewavas, 1930
Eustomias enbarbatus Welsh, 1923
Eustomias gibbsi Johnson and Rosenblatt, 1971
Eustomias ioani Parin and Pokhilskaya, 1974
Eustomias macronema Regan and Trewavas, 1930
Eustomias macrurus Regan and Trewavas, 1930
Eustomias melanostigma Regan and Trewavas, 1930
Eustomias orientalis Gibbs, Clarke, and Gomon, 1983
Eustomias pacificus Gibbs, Clarke, and Gomon, 1983
Eustomias perplexus Gibbs, Clarke, and Gomon, 1983
Eustomias satterleei Beebe, 1933
Eustomias schmidti Regan and Trewavas, 1930
Eustomias suluensis Gibbs, Clarke, and Gomon, 1983
Eustomias teuthidopsis Gibbs, Clarke, and Gomon, 1983
Eustomias vitiazi Parin and Pokhilskaya, 1974
Flagellostomias boureei (Zugmayer, 1913)
Leptostomias gladiator (Zugmayer, 1911)
Leptostomias gracilis Regan and Trewavas, 1930
Leptostomias macronema Gilbert, 1905
Melanostomias globulifer Fowler, 1934
Melanostomias melanops Brauer, 1902
Melanostomias paucilateratus Parin and Pokhilskaya, 1978
Melanostomias pauciradius Matsubara, 1938
Melanostomias pollicifer Parin and Pokhilskaya, 1978
Melanostomias stewarti Fowler, 1934
Melanostomias tentaculatus (Regan and Trewavas, 1930)
Melanostomias valdiviae Brauer, 1902
Melanostomias vierecki Fowler, 1934
Opostomias micripnus (Günther, 1878)
Pachystomias microdon (Günther, 1878)
Photonectes albipennis (Döderlein, 1882)
Photonectes braueri (Zugmayer, 1913)
Photonectes caeruleus Regan and Trewavas, 1930
Photonectes gracilis Goode and Bean, 1896
Photonectes margarita (Goode and Bean, 1896)
Photonectes mirabilis Parr, 1927
Photonectes parvimanus Regan and Trewavas, 1930
Thysanactis dentex Regan and Trewavas, 1930
Trigonalampa micriceps Regan and Trewavas, 1930

Reference

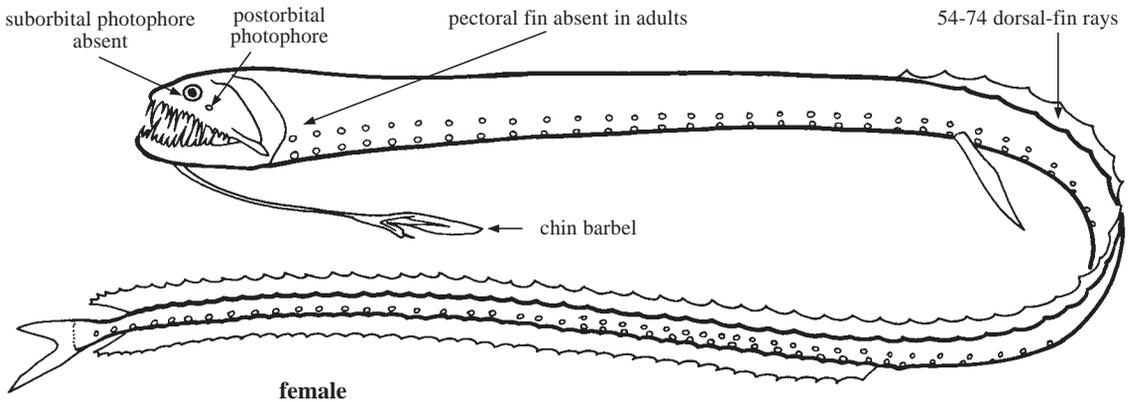
- Paxton, J.R. and J.E. Hanley. 1989. Melanostomiidae. In *Zoological catalogue of Australia 7. Pisces: Petromyzontidae to Carangidae*, edited by J.R. Paxton, D.F. Hoese, G.R. Allen, and J.E. Hanley, pp. 197-203.

IDIACANTHIDAE

Black dragonfishes (sawtailfishes)

by A.S. Harold

Diagnostic characters: Body markedly elongate, eel-like, slightly compressed (females to about 48 cm standard length). Head small. Snout equal to or less than orbit diameter. Mouth large in adult females, with numerous barbed, hinged, fang-like teeth, variable in size; jaw teeth absent in males; few teeth present on vomer and palatine. **Chin barbel length about twice that of head in females, absent in males.** Gill arches without rakers or teeth. Dorsal fin with very long base, its origin well anterior to midbody. Anal-fin base length about 1/2 of dorsal-fin base, its origin below middle rays of dorsal fin. Dorsal and anal fins terminating posteriorly on constricted portion of caudal peduncle. **Base of each dorsal and anal-fin ray with a small, sharp spur.** Dorsal fin with 54 to 74 rays; anal fin with 29 to 49 rays; caudal fin forked; **pectoral fins present in larvae, absent in adults; pelvic fins present in females, with 6 rays, absent in males.** Dorsal adipose fin absent. Scales absent. Two main rows of photophores on body ventrolaterally (see Astronesthidae family figure, page 1905, for definition of abbreviated terms); OA 52-61; IV 31-36; VAV 15-18; AC 13-18; paired row of photophores on isthmus (IP); small light organs scattered over head and body in patterns on each body segment; **suborbital photophore absent; postorbital photophore prominent, located posteroventrally, equal in size to eye in males, smaller in females.** Premaxillae not protractile. Mesethmoid bilobate anteriorly, with prominent lateral processes proximal to nasal sacs. Parietals absent. Gasbladder absent. **Colour:** skin usually black in females, males dark brown; hexagonal pigment areas lacking.

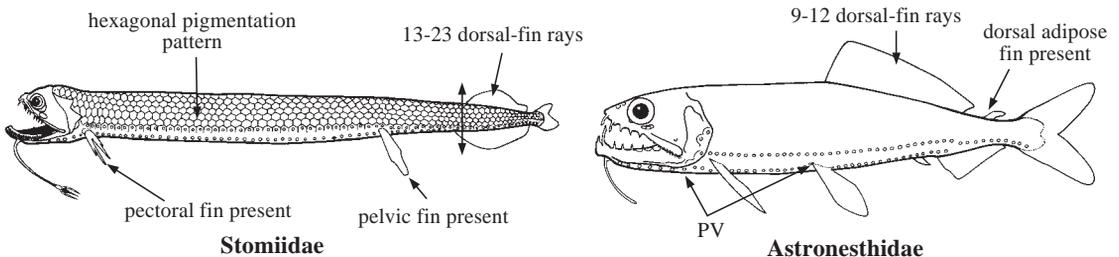


Habitat, biology, and fisheries: Meso- to bathypelagic, recorded to a depth of 2 000 m. Diet consists mainly of fishes. Markedly sexually dimorphic; males reaching about 15% of female body size, retaining some larval features; anterior anal-fin rays modified as intromittent organ. Eyes on the ends of long stalks in larvae.

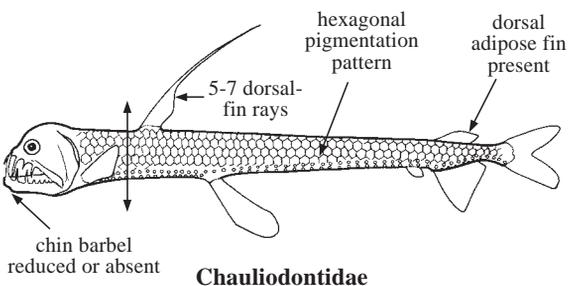
Similar families occurring in the area

Stomiidae: body elongate and slender but not eel-like; chin barbel present, with terminal bulb and filaments; scale-like areas on body delineated by hexagonal pigmentation pattern; dorsal fin short-based (13 to 23 rays), located posteriorly, just ahead of caudal fin; dorsal and anal-fin rays without basal spur; pectoral and pelvic fins present.

Astronesthidae: body fusiform and slightly compressed; chin barbel present in males and females; dorsal-fin short-based (9 to 21 rays), near middle of body, rays without basal spur; dorsal adipose fin present; anterior portion of ventral photophore row (PV) curving upward at pelvic-fin base.

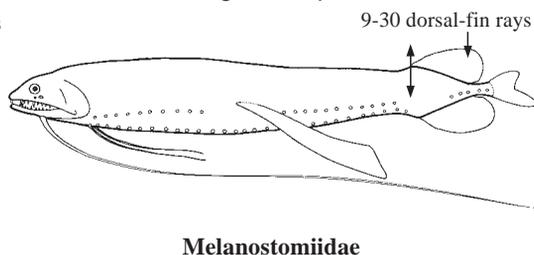
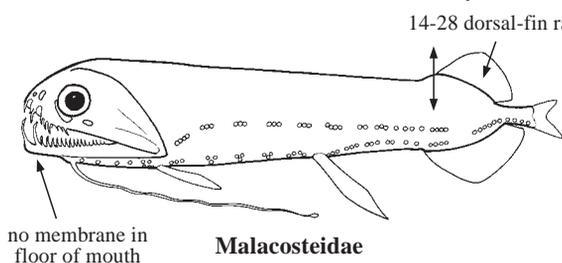


Chauliodontidae: body moderately elongate; chin barbel short and simple, becoming reduced or absent in adults; dorsal fin short-based (5 to 7 rays), located well anteriorly, between vertical through pectoral and pelvic fins, first ray prolonged; dorsal and anal-fin rays without basal spur; dorsal adipose fin present; scale-like areas on body delineated by hexagonal pigmentation pattern.



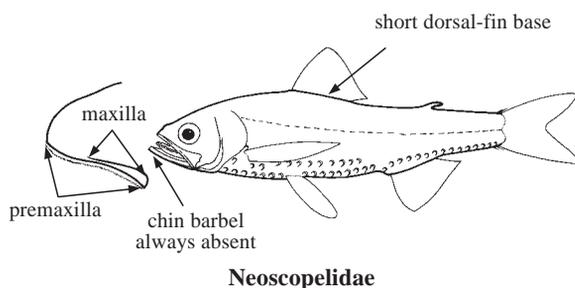
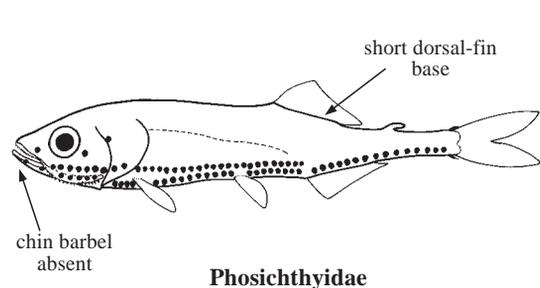
Malacosteidae: no membrane in floor of mouth; chin barbel present (*Aristomias*, *Photostomias*) or absent (*Malacosteus*); presence of a preorbital light organ (absent in *Photostomias*); dorsal fin short-based (14 to 28 rays), located posteriorly, just ahead of caudal fin; rays of dorsal and anal fins lacking basal spur; pectoral fins absent or consisting of only free, filament-like rays.

Melanostomiidae: body variable in shape, usually moderately elongate but not eel-like; maxillae with erect teeth anteriorly and small, oblique denticles posteriorly; dorsal fin short-based, located posteriorly, just ahead of caudal fin and above anal fin; rays of dorsal and anal fins lacking basal spur.



Gonostomatidae, Phosichthyidae, and Sternoptychidae: these remaining stomiiform families with somewhat similar photophore arrangement, but have gill rakers as adults, a relatively short dorsal fin, and lack both a chin barbel and enlarged, fang-like jaw teeth; only 1 genus, the monotypic *Triplophos*, has a highly elongate species.

Myctophidae and Neoscopelidae (myctophiform families): also with photophores, but with a much less elongate body, lack a chin barbel at all stages, have gill rakers as adults, and the maxilla is completely excluded from the gape by the premaxilla; ventral photophores are usually more widely spaced and not arranged in such regular rows as in the Idiacanthidae.



List of species occurring in the area

Idiacanthus antrostomus Gilbert, 1893

Idiacanthus atlanticus Brauer, 1906

Idiacanthus fasciola Peters, 1877

References

Fujii, E. 1984. Family Idiacthidae. In *Fishes of the Japanese Archipelago*, edited by H. Masuda, K. Amaoka, C. Araga, T. Uyeno, and T. Yoshino. Tokyo, Tokai University Press, pp. 53-54.

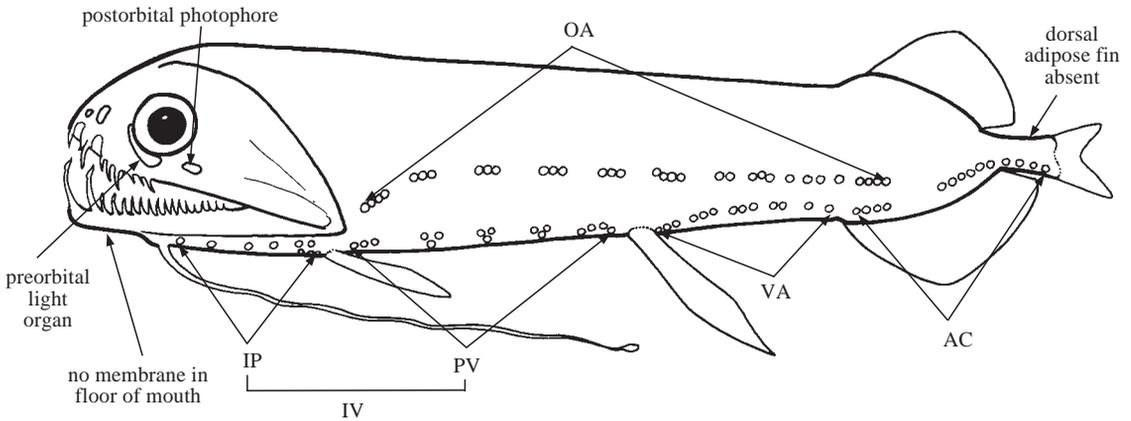
Paxton, J.R. and J.E. Hanley. 1989. Idiacthidae. In *Zoological catalogue of Australia 7. Pisces: Petromyzontidae to Carangidae*, edited by J.R. Paxton, D.F. Hoese, G.R. Allen, and J.E. Hanley, p. 208.

MALACOSTEIDAE

Loosejaws

by A.S. Harold

Diagnostic characters: Body moderately elongate (to about 24 cm standard length), compressed. Head and eye large relative to body. Snout usually quite short (elongate in *Aristomias*). **Mouth large, jaws longer than skull, about 15 to 30% standard length; membranes lacking between rami of lower jaw.** Jaw teeth variable in size, some very large and barbed. Vomerine teeth absent; palatine with or without teeth. **Chin barbel present or absent.** Branchiostegal rays 9 to 15. Gill arches with teeth reduced or absent; no well-developed rakers. **Dorsal fin located well posteriorly just anterior to caudal fin, directly above anal fin.** Dorsal fin with 14 to 28 rays; anal fin with 17 to 32 rays; caudal fin small, forked; **pectoral fins absent or consisting of 2 to 17 free, filament-like rays;** pelvic fins at about midbody, with 5 to 9 rays. **Dorsal and ventral adipose fins absent.** Scales absent, no hexagonal areas on body. Two ventrolateral rows of photophores on body (poorly developed and inconspicuous in *Malacosteus*); OA 7-39; IC 12-22; paired row of photophores on isthmus (IP); many small light organs covering much of body and head; **preorbital light organ present or absent;** suborbital photophore present, varying in size from minute to very large, or absent; **postorbital photophore prominent, located posteroventrally to eye.** Premaxillae not protractile. Parietals and posttemporals absent. First few vertebrae unossified. Stomach distensible, pigmented. Pyloric caecae present or absent. **Colour:** skin black to dark brown.



Habitat, biology, and fisheries: Meso- to bathypelagic adults, at depths to 4 000 m. Diet consists of fishes and crustaceans. Floor of lower jaw lacks membranes, which allows the jaws to swing widely while feeding, hence the common name "loosejaws".

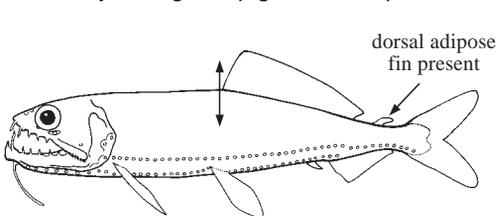
Similar families occurring in the area

Astronesthidae: membrane present in floor of mouth; chin barbel present, terminal bulb present or absent; dorsal-fin near middle of body, its origin well ahead of anal-fin origin; dorsal adipose fin present; anterior portion of ventral photophore row (PV) curving upward at pelvic-fin base.

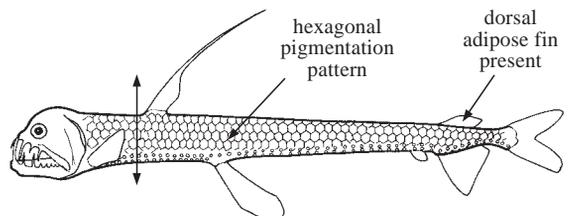
Chauliodontidae: membrane present in floor of mouth; body elongate, maximum depth at back of head; chin barbel short and simple, becoming reduced or absent in adults; dorsal fin well anterior, between vertical through pectoral and pelvic fins; pectoral and pelvic fins present; scale-like areas on body delineated by hexagonal pigmentation pattern.

abbreviated terminology of photophores

- AC - ventral series posterior to anal-fin origin
- IP - ventral series anterior to pectoral-fin base
- IV - ventral series anterior to pelvic-fin base
- OA - lateral series
- PV - ventral series between bases of pectoral and pelvic fins
- VAV - ventral series between pelvic-fin base and anal-fin origin



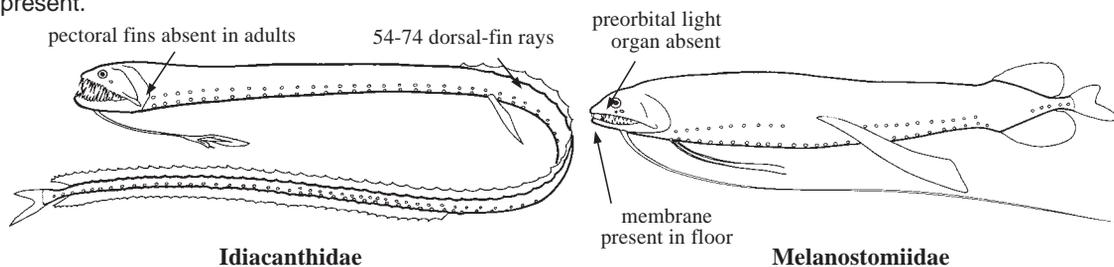
Astronesthidae



Chauliodontidae

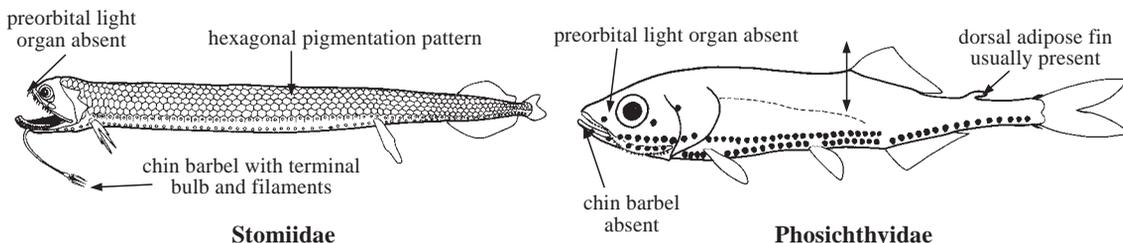
Idiacanthidae: body highly elongate, eel-like; membrane present in floor of mouth; dorsal fin with very long base (54 to 74 rays), its origin well anterior to midbody; bases of dorsal- and anal-fin rays with a small sharp spur; pectoral fins present in larvae, absent in adults; pelvic fins absent in males.

Melanostomiidae: membrane present in floor of mouth; maxillae with erect teeth anteriorly and small, oblique denticles posteriorly; chin barbel present, variable in length; pectoral fins present or absent; pelvic fins present.

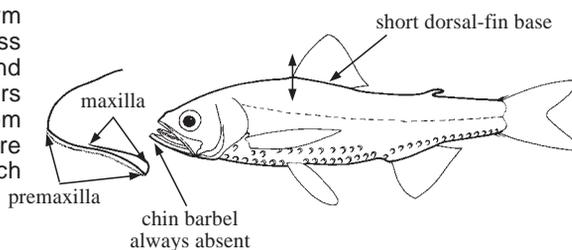


Stomiidae: body elongate and slender; chin barbel present, with terminal bulb and filaments; membrane present in floor of mouth; scale-like areas on body delineated by hexagonal pigmentation pattern; pectoral and pelvic fins present.

Gonostomatidae, Phosichthyidae, and Sternoptychidae: these remaining stomiiform families often with somewhat similar body form and photophore arrangement, but all have membrane present in the floor of mouth and gill rakers as adults, and lack both a chin barbel and greatly enlarged, fang-like jaw teeth.



Myctophidae and Neoscopelidae (myctophiform families): with conspicuous photophores, a less elongate body, lack a chin barbel at all stages and have membrane present in floor of mouth, gill rakers as adults and the maxilla completely excluded from the gape by the premaxilla; ventral photophores are usually more widely spaced and not arranged in such regular rows as in the Malacosteidae.



List of species occurring in the area

- Aristomias grimaldii* Zugmayer, 1913
- Aristomias lunifer* Regan and Trewavas, 1930
- Aristomias polydactylus* Regan and Trewavas, 1930
- Aristomias tittmanni* Welsh, 1923
- Aristomias xenostoma* Regan and Trewavas, 1930
- Malacosteus indicus* Günther, 1878
- Malacosteus niger* Ayres, 1848
- Photostomias guernei* Collett, 1889

References

- Fujii, E. 1984. Family Malacosteidae. In *Fishes of the Japanese Archipelago*, edited by H. Masuda, K. Amaoka, C. Araga, T. Uyeno, and T. Yoshino. Tokyo, Tokai University Press, p. 53.
- Paxton, J.R. and J.E. Hanley. 1989. Malacosteidae. In *Zoological catalogue of Australia 7. Pisces: Petromyzontidae to Carangidae*, edited by J.R. Paxton, D.F. Hoese, G.R. Allen, and J.E. Hanley, p. 204.

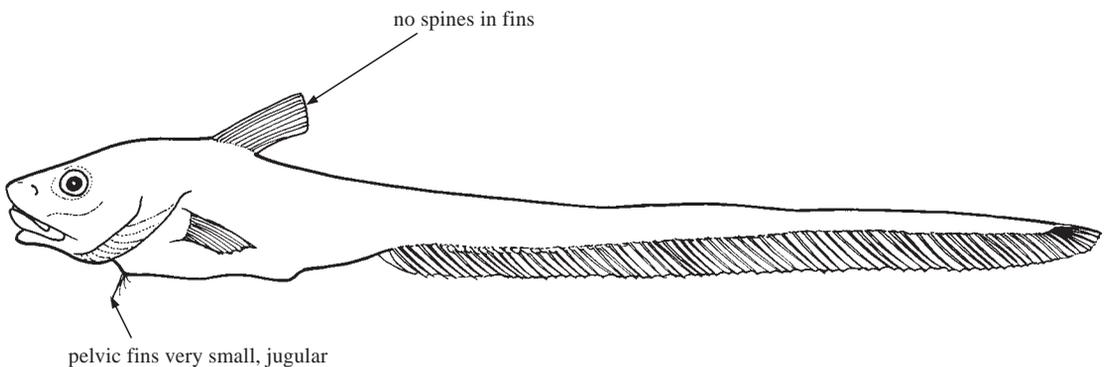
Order ATELEOPODIFORMES

ATELEOPODIDAE

Jellynoses (tadpole fishes)

by J.A. Moore

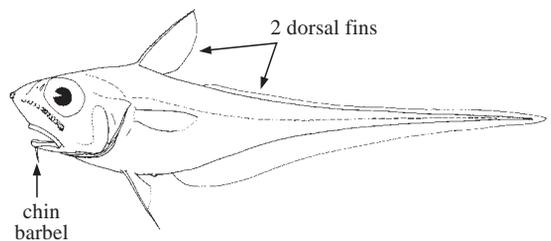
Diagnostic characters: Elongate fishes (to 2 m) with soft, flabby body; trunk short; tail elongate, compressed and tapering. Head moderate sized; eyes small to moderate; snout pointed or rounded, very soft and gelatinous; mouth subterminal and protrusible; broad band of small villiform teeth present or absent on premaxilla and mandible. Branchiostegals 7. **No fin spines**; short-based single dorsal fin just behind head with 3 to 12 rays; anal fin elongate and united with caudal fin, 85 to 120 rays total; pectoral-fin rays 12 to 14; pelvic fins jugular, 2 to 4 rays with single long ray in adults. Scales only present imbedded in lateral-line canal. **Colour:** light brown to dark purplish brown.



Habitat, biology, and fisheries: Uncommon benthic or benthopelagic fishes usually taken between 200 and 800 m. Little known of general biology. Some species feed on benthic invertebrates. No commercial importance.

Similar families occurring in the area

Macrouridae: chin barbel usually present; often spinous rays in first dorsal fin; long, low second dorsal fin behind first dorsal fin; scales cover portions of body and head.



Macrouridae

List of species occurring in the area

Ateleopus indicus Alcock, 1891

Ateleopus japonicus Bleeker, 1853

Ateleopus sp.

Ijimaia sp.

Parateleopus microstomus Smith and Radcliffe, 1912

Reference

Smith, M.M. 1986. Family Ateleopodidae. In *Smiths' sea fishes*, edited by M.M. Smith and P.C. Heemstra. Johannesburg, Macmillan South Africa, pp. 404-406.