

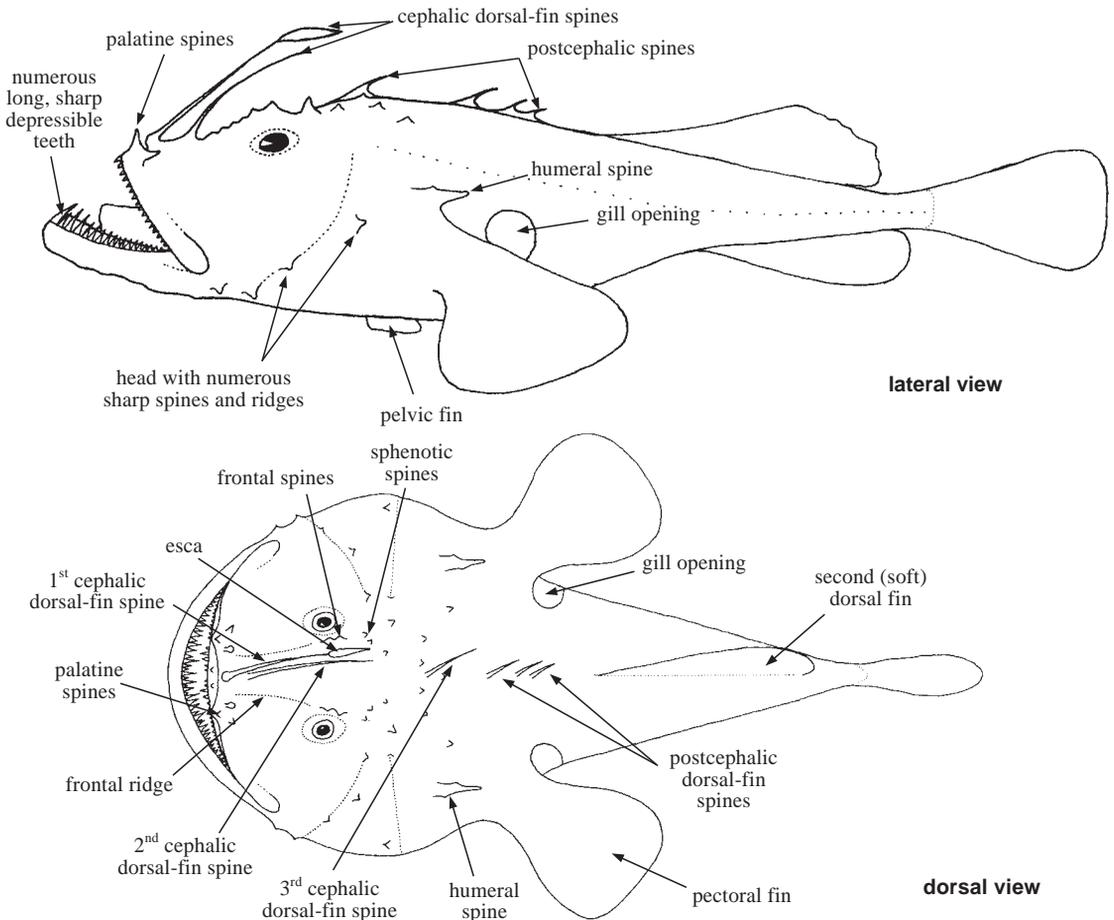
**Order LOPHIIFORMES**

**LOPHIIDAE**

**Anglerfishes (monkfishes)**

by J.H. Caruso

**D** **Diagnostic characters:** Head and anterior part of body usually depressed and very broad, posterior portion of body tapering. Lateral line present, but usually indistinct. **Skin smooth, naked**, often with fleshy flaps on head and/or body (well visible only when fish is immersed in fluid). **Head bearing numerous sharp spines and ridges on dorsal and lateral surfaces**, the most conspicuous of which are the following: a single very large, prominent spine or group of spines immediately anterior to each pectoral-fin base (humeral spines); a pair of sharp prominent spines on either side of snout immediately behind mouth (palatine spines); a bony ridge above eyes with 2 or 3 short spines (frontal spines), and 2 bony ridges on snout running forward from eyes (frontal ridges); interorbital space slightly to strongly concave. **Mouth very large and wide**, upper jaw protractile and lower jaw projecting, **both bearing numerous long, sharp, depressible teeth**. **Gill openings large**, low in pectoral axil, extending forward in front of pectoral-fin base in some species. **Two separate spinous dorsal fins, the first composed of II or III isolated slender spines** (cephalic spines) on head and the second of II or III spines (often connected by a membrane, at least in juveniles), on the body at the level of pectoral fins (post cephalic spines); first 2 cephalic spines located at anterior end of snout, **foremost modified into an angling apparatus, usually bearing a fleshy appendage (esca) at tip**; third cephalic spine, when present, located at level of humeral spines; pectoral-fin rays unbranched, terminating in small fleshy filaments; pelvic fins on ventral surface of head, anterior to pectoral fins; anal fin with 6 to 11 soft rays, below second dorsal fin; caudal fin with 8 rays, the 2 outer unbranched. **Colour:** dorsal surface usually uniform light to dark brown or grey (often changing with substrate), lighter on ventral surface; distinctive markings present in some species.

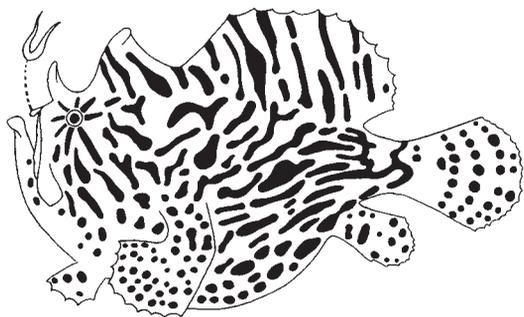


**Habitat, biology, and fisheries:** Most anglerfishes or monkfishes inhabit bottom waters of the outer continental shelf and upper continental slope, usually at depths in excess of 100 m (a single species has been found beyond 1 500 m). Adults are primarily piscivorous, usually lying motionless and well camouflaged on the bottom waiting for prey to approach, at which time they vigorously wave the bait at the end of the first dorsal-fin spine to attract the prey to within striking distance of their capacious mouths. In nearly all species for which the mode of egg production is known (several *Lophius* species), the eggs are shed in remarkable bouyant, ribbon-like, non-adhesive, mucoid veils which in some species of may be as much as 12 m long, and 1.5 m wide. Within each veil the eggs (which may number in excess of 1.3 million) are arranged in a single layer, lying one to four in separate hexagonal compartments, with an oil globule uppermost. Each compartment has an opening which provides water circulation. Although a single species of *Lophius* may achieve a length of nearly 2 m, other members of that genus generally achieve less than half that size, and most other members of the family achieve less than half that (i.e. 0.5 m). Anglerfishes are marketed commercially in the northern part of the area.

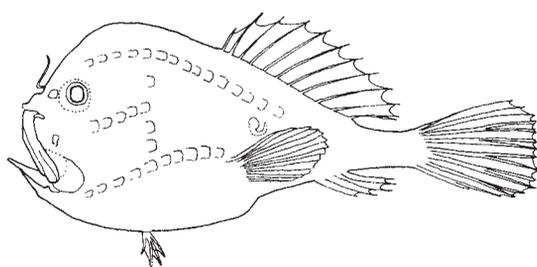
### Similar families occurring in the area

Antennariidae: body short, globose, slightly compressed; teeth small, villiform.

Chauacidae: body rounded, slightly compressed; head cuboid, devoid of long, slender dorsal-fin spines; mouth large, but without long, sharp teeth; skin loose, covered with small spiny scales; lateral line conspicuous on head and body; colour deep pink or reddish, some species spotted.



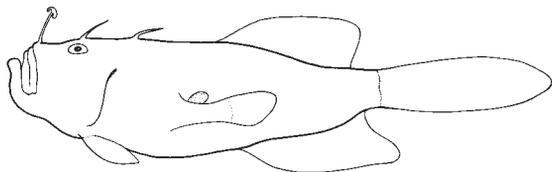
Antennariidae



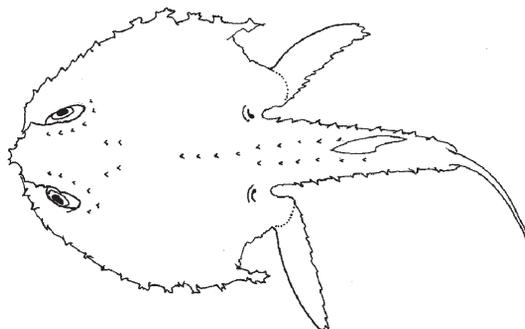
Chauacidae

Lophichthyidae: body compressed and elongate; second and third dorsal-fin spines widely separated, not connected by membrane, not enveloped by thick skin.

Ogcocephalidae: head and body strongly depressed; head devoid of long slender dorsal-fin spines; angling apparatus small, placed in a depression between snout tip and mouth; mouth very small, without long and sharp teeth.



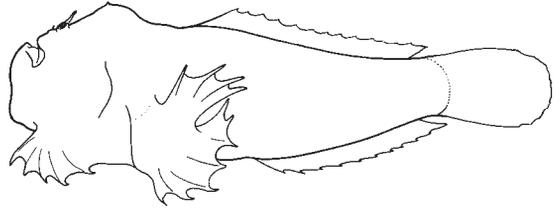
Lophichthyidae



Ogcocephalidae

Tetrabrachiidae: body strongly compressed and elongate; pectoral fin double, dorsalmost ray of ventral portion membranously attached to side of body; pectoral-fin lobe membranously attached to rays of pelvic fin.

Meso- and bathypelagic anglerfish families: body shape variable, but not depressed; no pelvic fins; second and third dorsal-fin spines greatly reduced or absent.



Tetrabrachiidae

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

- 1a. Head and body rounded, not depressed; third cephalic dorsal-fin spine absent. . . *Sladenia remiger*
- 1b. Head and body depressed; third cephalic dorsal-fin spine present . . . . . → 2
  
- 2a. Frontal ridges rugose, bearing low conical spines; gill opening not extending well in front of pectoral-fin base, restricted to below and behind base; floor of mouth with distinct pattern of dark anastomosing lines or pale circles on dark background . . . . . *Lophiomus setigerus*
- 2b. Frontal ridges smooth, not rugose; gill opening extending well in front of pectoral-fin base . . . . . (*Lophiodes*) → 3
  
- 3a. Spinous dorsal fin with VI spines in 2 groups (III on head: cephalic portion; and III on body directly in front of soft dorsal fin: postcephalic portion) . . . . . (*Lophiodes naresi* species group) → 4
- 3b. Spinous dorsal fin with less than VI spines (III cephalic spines, 0-III postcephalic spines). . . . . → 5
  
- 4a. No tendrils on dorsal-fin spines; peritoneum pale (i.e. the thin layer of tissue that lines the abdominal cavity - specimen must be dissected to see this) . . . . . *Lophiodes gracilimanus*
- 4b. All but first dorsal-fin spine with numerous large, flattened, elaborate tendrils; peritoneum black . . . . . *Lophiodes naresi*
  
- 5a. Third cephalic dorsal-fin spine very short (2.5 to 7.3% of standard length); postcephalic dorsal fin spines absent; inner frontal spines absent . . . . . *Lophiodes infrabrunneus*
- 5b. Third cephalic dorsal-fin spine very long (36 to 64% of standard length); I or II post-cephalic dorsal-fin spines present; inner frontal spines present (reduced in large individuals) . . . . . *Lophiodes mutilus*

**List of species occurring in the area**

The symbol is given when species accounts are included.

- Lophiodes gracilimanus* (Alcock, 1899)
- Lophiodes infrabrunneus* Smith and Radcliffe in Radcliffe, 1912
- Lophiodes mutilus* (Alcock, 1893)
- Lophiodes naresi* (Günther, 1880)
  
- Lophiomus setigerus* (Vahl, 1797)
  
- Sladenia remiger* Smith and Radcliffe in Radcliffe, 1912

**References**

Caruso, J.H. 1981. The systematics and distribution of the lophiid anglerfishes. I: A revision of the genus *Lophiodes* with the description of two new species. *Copeia*, 1981(3):522-549.

Caruso, J.H. 1983. The systematics and distribution of the lophiid anglerfishes. II: Revisions of the genera *Lophiomus* and *Lophius*. *Copeia*, 1983(1):11-30.

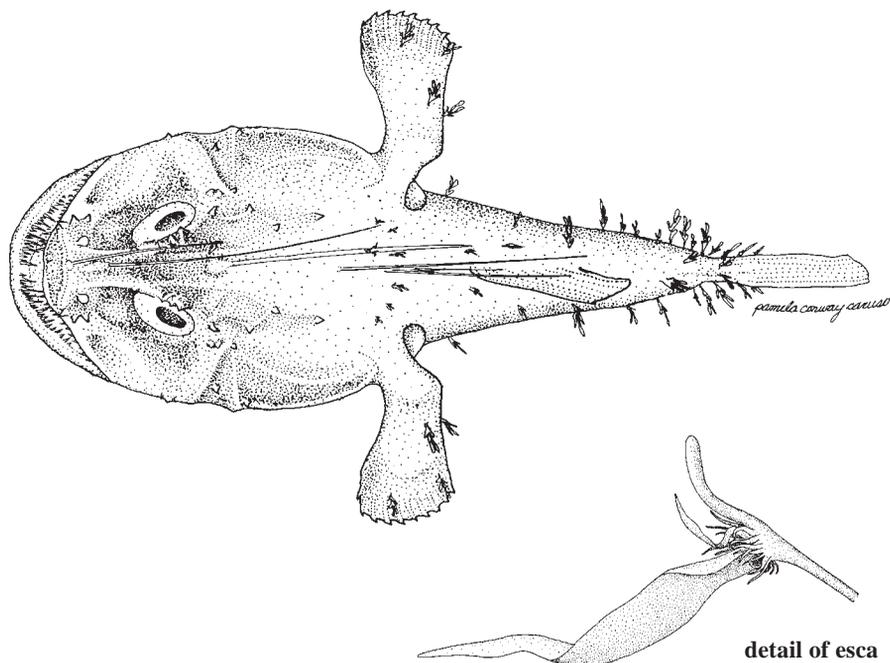
Caruso, J.H. 1985. The systematics and distribution of the lophiid anglerfishes. III: Intergeneric relationships. *Copeia*, 1985(4):870-875.

Caruso, J.H. and H.R. Bullis, Jr. 1976. A revision of the lophiid anglerfish genus *Sladenia* with the description of a new species from the Caribbean Sea. *Bull. Mar. Sci.*, 26(1):59-64.

***Lophiodes gracilimanus*** (Alcock, 1899)

**Frequent synonyms / misidentifications:** None / None.

**FAO names:** En - Malabar monkfish.



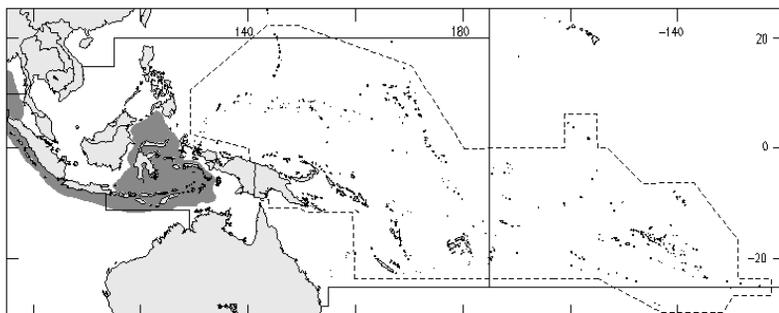
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**Diagnostic characters:** Head and anterior part of body depressed, posterior portion of body tapering. Head bearing numerous sharp spines on dorsal and lateral surfaces; humeral spines (in front of pectoral-fin bases) long and well developed; **inner sphenotic spines (just behind eyes) well developed and strongly recurved, outer sphenotic spines vestigial, represented by low rounded knob or ridge; frontal ridges (running forward from eyes) smooth, without knobs or ridges; frontal spines recurved; supraorbital crests elevated, forming deep U-shaped trough between eyes; gill openings extending below, behind, and in front of pectoral-fin bases. First dorsal fin consisting of III isolated spines on head (cephalic spines), and a group of III short slender spines behind head (postcephalic spines) connected by a low membrane; foremost dorsal-fin spine modified into an angling apparatus bearing a fleshy lure (esca) consisting of a pennant-like flap, long cirri, and usually II small, dark, stalked shrimp-like "eyes"; second dorsal-fin spine very long, reaching base of fourth or fifth dorsal-fin spine. Second (soft) dorsal fin with 8 rays; anal fin with 6 rays; pectoral fins with 14 to 16 rays. **Colour:** dorsal surface uniform medium to dark brown, fleshy tendrils darker brown or black; ventral surface lighter brown or tan; pectoral fins darker brown distally, but tips of rays pale; peritoneum pale.**

**Size:** Maximum total length probably less than 40 cm.

**Habitat, biology, and fisheries:** Benthic on continental slope; biology unknown.

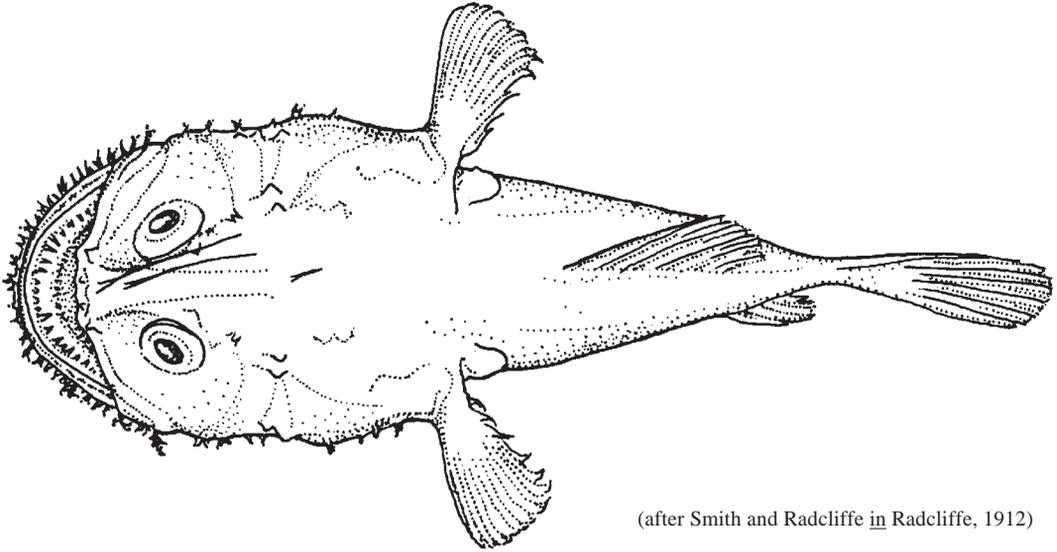
**Distribution:** Currently known only from the Bay of Bengal, Arabian Sea, and the deeper waters off Indonesia.



*Lophiodes infrabrunneus* Smith and Radcliffe in Radcliffe, 1912

**Frequent synonyms / misidentifications:** None / None.

**FAO names:** En - Shortspine monkfish.



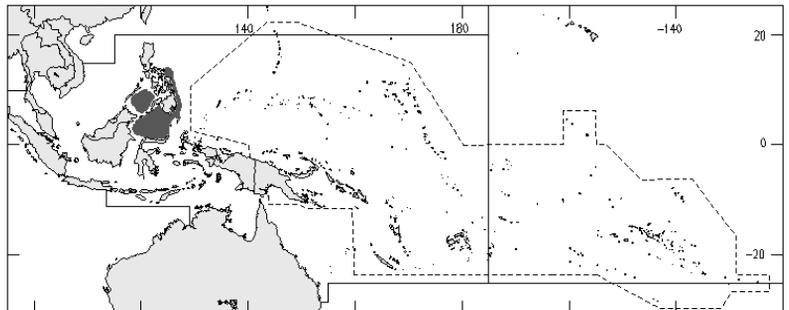
(after Smith and Radcliffe in Radcliffe, 1912)

**Diagnostic characters:** Head and anterior part of body depressed, posterior portion of body tapering. Head bearing numerous sharp spines on dorsal and lateral surfaces; humeral spines (in front of pectoral-fin bases) long and well developed; **inner sphenotic spines (just behind eyes) well developed, outer sphenotic spines vestigial, represented by low rounded knob or ridge; frontal ridges (running forward from eyes) smooth, without knobs or ridges; gill openings extending below, behind, and in front of pectoral-fin bases. First dorsal fin consisting of only III isolated spines on head (cephalic spines), postcephalic dorsal-fin spines absent; foremost dorsal-fin spine modified into an angling apparatus; second cephalic dorsal-fin spine short; third cephalic dorsal-fin spine very short (2.5 to 7.3% of standard length).** Second (soft) dorsal fin with 8 rays; anal fin with 6 rays; pectoral fins with 15 or 16 rays. **Colour:** dorsal surface uniform medium to dark brown, fleshy tendrils absent from body and fins; ventral surface lighter brown or tan, but darker in some specimens; **peritoneum pale.**

**Size:** Maximum total length probably less than 40 cm.

**Habitat, biology, and fisheries:** Benthic on continental slope; depth range 494 to 1 560 m. It is thus the deepest living of all known monkfishes. Biology unknown.

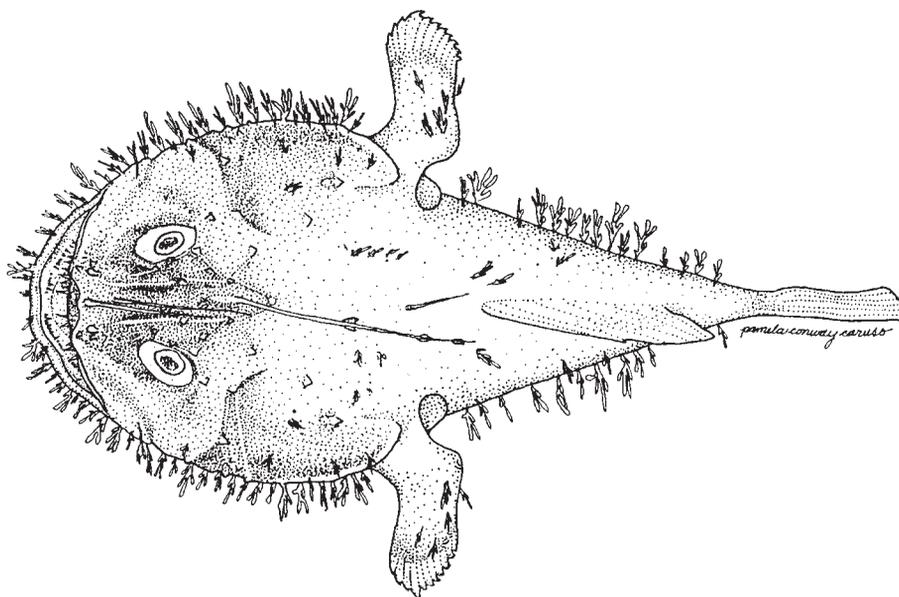
**Distribution:** Currently known only from the vicinity of the Philippines.



***Lophiodes mutilus*** (Alcock, 1893)

**Frequent synonyms / misidentifications:** None / None.

**FAO names:** En - Smooth angler; Fr - Baudroie marache; Sp - Raspe liso.

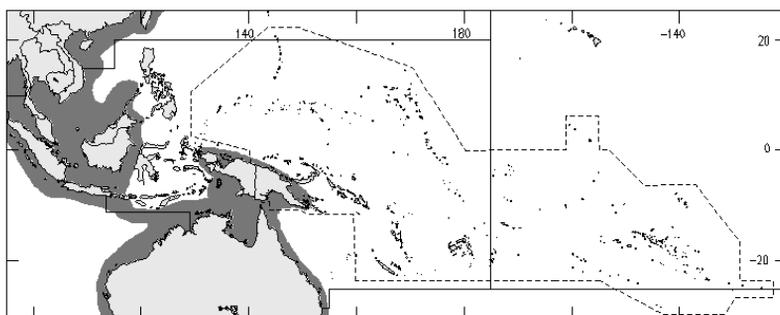


**Diagnostic characters:** Head and anterior part of body depressed, posterior portion of body tapering. Head bearing numerous sharp spines on dorsal and lateral surfaces; humeral spines (in front of pectoral-fin bases) long and well developed; **inner sphenotic spines (just behind eyes) well developed, outer sphenotic spines vestigial, represented by low rounded knob or ridge; frontal ridges (running forward from eyes) smooth, without knobs or ridges; gill openings extending below, behind, and in front of pectoral-fin bases.** First dorsal fin consisting of III isolated spines on head (cephalic spines), and I or II very short slender spines behind head (postcephalic spines) which may be connected by a low membrane or may be embedded beneath the skin; **foremost dorsal-fin spine modified into an angling apparatus bearing a lure (esca) consisting of a simple, small, lightly pigmented bulb; second dorsal-fin spine short, third dorsal-fin spine very long.** Second (soft) dorsal fin with 8 rays; anal fin with 6 rays; pectoral fins with 15 to 18 rays. **Colour:** dorsal surface uniform light to dark brown, fleshy tendrils darker brown or black; ventral surface lighter brown or tan; pectoral fins darker brown distally, but tips of rays pale; **peritoneum black.**

**Size:** Maximum total length probably less than 40 cm; commonly to 30 cm.

**Habitat, biology, and fisheries:** Benthic on continental slope; depth range 300 to 495 m; biology unknown.

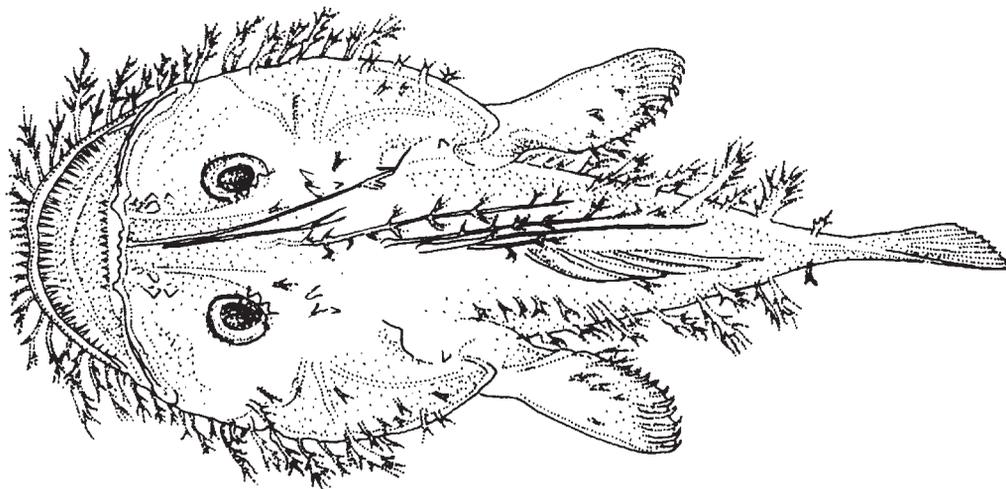
**Distribution:** Widespread across the entire Indo-West Pacific, from Taiwan Province of China and southeastern Australia west to the Natal Coast of South Africa.



***Lophiodes narsi*** (Günther, 1880)

**Frequent synonyms / misidentifications:** None / None.

**FAO names:** En - Challenger monkfish.

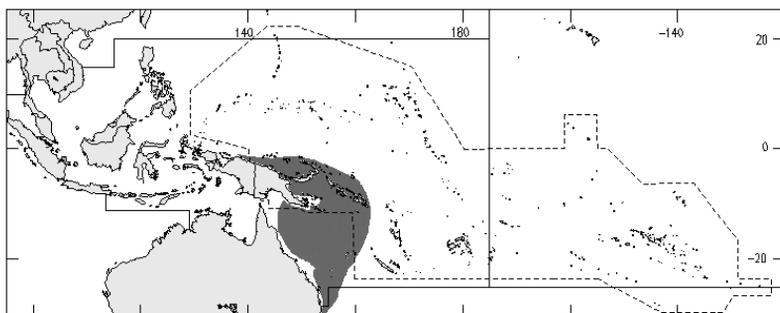


**Diagnostic characters:** Head and anterior part of body depressed, posterior portion of body tapering. Head bearing numerous sharp spines on dorsal and lateral surfaces; humeral spines (in front of pectoral-fin bases) long and well developed; **inner sphenotic spines (just behind eyes) well developed and strongly recurved, outer sphenotic spines vestigial, represented by low rounded knob or ridge; frontal ridges (running forward from eyes) smooth, without knobs or ridges; frontal spines recurved; supraorbital crests elevated, forming deep U-shaped trough between eyes; gill openings extending below, behind, and in front of pectoral-fin bases. First dorsal fin consisting of III isolated spines on head (cephalic spines), and a group of III short slender spines behind head (postcephalic spines) connected by a low membrane; foremost dorsal-fin spine modified into an angling apparatus bearing a fleshy lure (esca) consisting of a pennant-like flap, long cirri, and usually II small, dark, stalked shrimp-like "eyes"; second and third dorsal-fin spines very long and stout, and all but first with numerous large, flattened, elaborate tendrils. Second (soft) dorsal fin with 8 rays; anal fin with 6 rays; pectoral fins with 14 to 16 rays. **Colour:** dorsal surface uniform medium to dark brown, numerous large, fleshy tendrils darker brown or black; ventral surface lighter brown or tan; pectoral fins darker brown distally, but tips of rays pale; **peritoneum black.****

**Size:** Maximum total length probably less than 40 cm.

**Habitat, biology, and fisheries:** Benthic on continental slope; depth range 183 to 457 m; biology unknown.

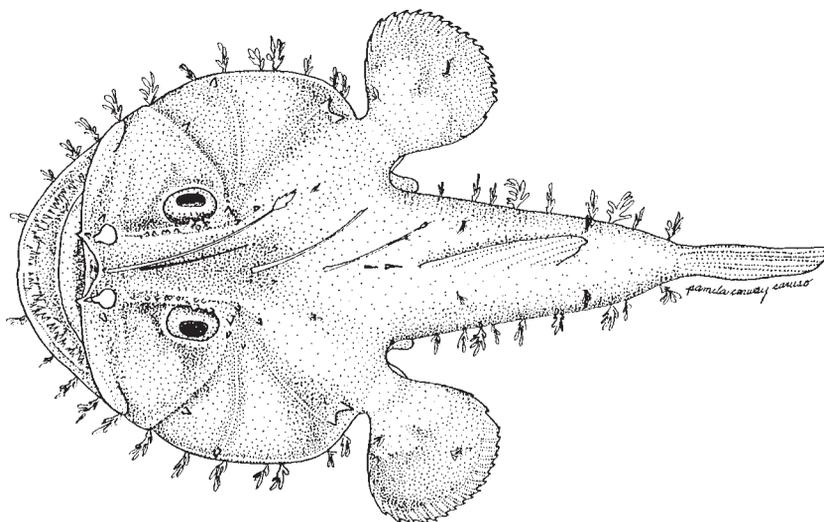
**Distribution:** Presently known only from the Philippine and Admiralty Islands and the east coast of Australia.



***Lophiomus setigerus* (Vahl, 1797)**

**Frequent synonyms / misidentifications:** None / None.

**FAO names:** En - Blackmouth angler; Fr -Baudroie bouche noire; Sp - Rape boca negra.

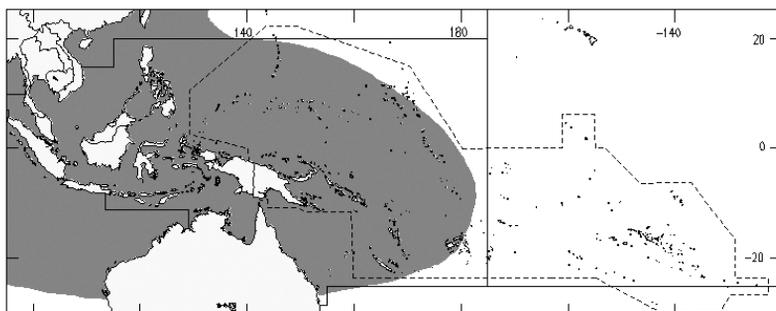


**Diagnostic characters:** Head and anterior part of body depressed, posterior portion of body tapering. Head bearing numerous sharp spines on dorsal and lateral surfaces; humeral spines (in front of pectoral-fin bases) long and well developed; **inner and outer sphenotic spines (just behind eyes) well developed**; **frontal ridges (running forward from eyes), and outer surfaces of dentary, maxilla, and articular bones covered with low, sharply pointed conical spines**; gill openings extending below and behind, but not in front of pectoral-fin bases. First dorsal fin consisting of III isolated spines on head (cephalic spines), and a group of 3 short slender spines behind head (postcephalic spines) connected by a low membrane; foremost dorsal-fin spine modified into an angling apparatus bearing a fleshy lure (esca) consisting of a pennant-like flap, long cirri, and usually II small, dark, stalked shrimp-like “eyes”; **second dorsal-fin spine darkly pigmented, stout, short, and with numerous short tendrils present**; dorsal-fin spines III through VI long, slender, pigmented as dorsal body surface, and devoid of tendrils. Second (soft) dorsal fin with 8 rays; anal fin with 6 rays; **pectoral fins with 21 to 25 rays**. **Colour:** dorsal surface uniform light to dark brown, numerous large, fleshy tendrils darker brown or black; ventral surface lighter brown or tan; pectoral fins darker brown distally, but tips or rays pale; **floor of mouth in small specimens very dark brown or black with numerous light circular patches, in larger specimens circular patches increase in size creating appearance of anastomosing black lines**; pigmentation of peritoneum variable, usually dusky, light and dark extremes rare.

**Size:** Maximum total length probably less than 40 cm.

**Habitat, biology, and fisheries:** Benthic on outer continental shelf and upper continental slope; depth range 72 to 238 m; biology unknown.

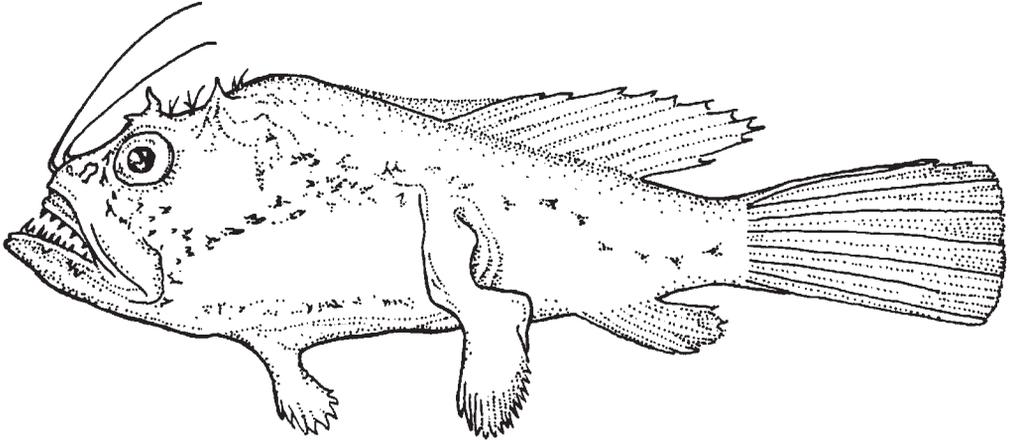
**Distribution:** Widespread throughout the Indian Ocean and Indo-West Pacific; known from Japan to southeastern Australia in the east to Madagascar in the west.



*Sladenia remiger* Smith and Radcliffe in Radcliffe, 1912

**Frequent synonyms / misidentifications:** None / None.

**FAO names:** En - Celebes monkfish.



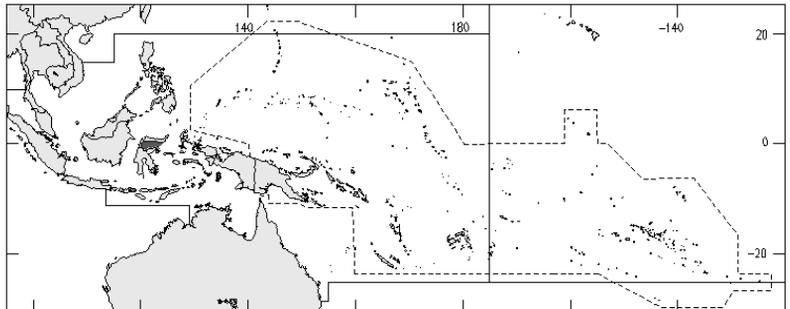
(after Smith and Radcliffe in Radcliffe, 1912)

**Diagnostic characters:** Head and anterior part of body rounded, not depressed, posterior portion of body tapering. Head bearing few sharp spines on dorsal and lateral surfaces; humeral (and subopercular, quadrate, parietal, and articular) spines absent; inner sphenotic spines (just behind eyes) well developed, outer sphenotic spines vestigial; frontal ridges (running forward from eyes) smooth; gill openings extending below, behind, and well in front of pectoral-fin bases. First dorsal fin consisting of 11 isolated spines on head (cephalic spines), and a single very short, slender spine behind head contained in a loose fold of skin (postcephalic spine); foremost dorsal-fin spine modified into an angling apparatus; second dorsal fin shorter than first and inserted close behind it. Second (soft) dorsal fin with 9 rays; anal fin with 7 rays; pectoral fins with 19 rays. **Colour:** uniform greyish brown.

**Size:** Maximum total length probably less than 40 cm.

**Habitat, biology, and fisheries:** Benthic on continental slope; biology unknown.

**Distribution:** Presently known from only a single specimen collected in the Gulf of Tomini in the Celebes at a depth of 1 294 m.

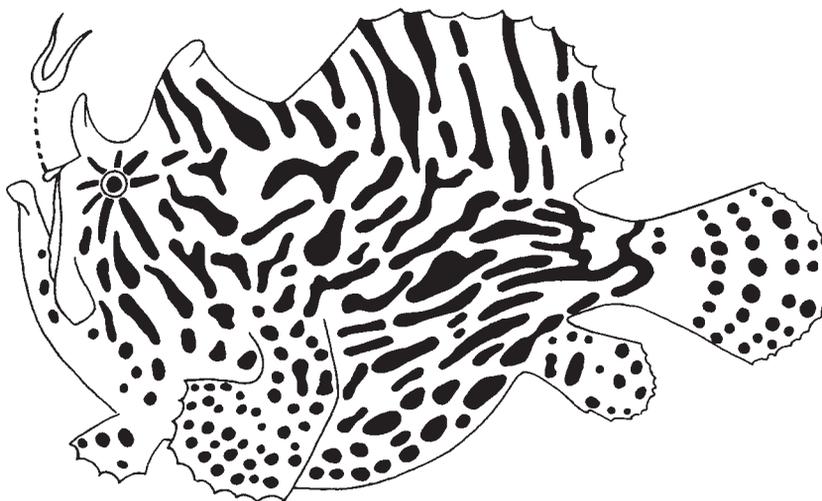


## ANTENNARIIDAE

### Frogfishes (also sea mice, anglerfishes)

by T.W. Pietsch

**Diagnostic characters:** Body short, deep, globose, slightly compressed. Mouth large, oblique to vertical, with numerous, small, villiform teeth. Eyes small, lateral. **Opercular (gill) opening restricted to a small pore** located behind and below pectoral-fin base. Spinous dorsal fin of III spines, widely separated from soft part of fin. **First dorsal-fin spine (illicium) free from rest of fin, nearly always bearing a well-developed terminal bait (esca)**; second and third dorsal-fin spines also free from rest of fin, well developed, and covered by thick skin. **Pectoral-fin lobe elongate, leg-like**; fin single, not divided into upper and lower portions. Skin spinulose or naked, often with membranous filaments or flaps. **Colour:** usually in 2 phases: a more common light phase with light tan to yellow, brown or rust background usually overlaid with black, brown, pink, or bright yellow streaks, bars, and/or spots on head, body, and fins; a dark phase with dark brown to black background with streaks, bars, or spots showing through as deeper black, tips of rays of paired fins often white.

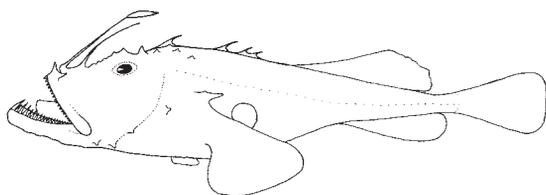


**Habitat, biology, and fisheries:** Frogfishes spend the greater part of their lives squatting on the bottom in shallow water or, as in the case of *Histrio*, clinging in floating sargassum weed. Despite their sedentary nature, nearly all are voracious carnivores that sit quietly waiting for smaller fishes to pass by at which time they enticingly wriggle their bait to attract the potential prey to their cavernous mouths. Their ovaries are tightly rolled like a double scroll, and eggs are released embedded in a single, large, buoyant gelatinous mass. Some frogfishes reach a total length of over 50 cm, but most species do not exceed 20 cm. Besides their value in the aquarium trade, they are of no significant economic interest in the Western Central Pacific, where they are caught incidentally in bottom trawls and only occasionally eaten by local populations.

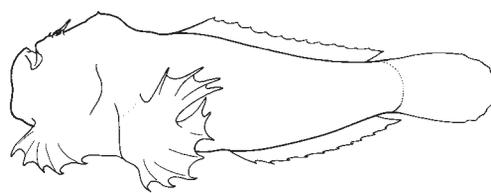
#### Similar families occurring in the area

Lophiidae: body greatly depressed (flattened dorsoventrally), not globose.

Tetrabrachiidae: pectoral fin double, dorsalmost ray of ventral portion membranously attached to side of body; pectoral-fin lobe membranously attached to rays of pelvic fin; body elongate, strongly compressed.



Lophiidae



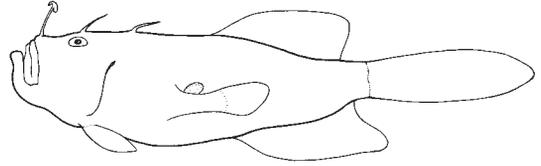
Tetrabrachiidae

Lophichthyidae: second and third dorsal-fin spines widely separated, not connected by membrane, not enveloped by thick skin; body narrow, elongate, compressed.

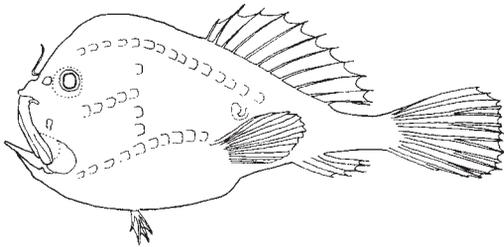
Chaunacidae: second and third dorsal-fin spines reduced and embedded beneath skin; pelvic fins of I spine and 4 rays; body globose, slightly compressed.

Ogcocephalidae: remnant of second dorsal-fin spine embedded beneath skin, third dorsal-fin spine absent; body greatly depressed, not globose.

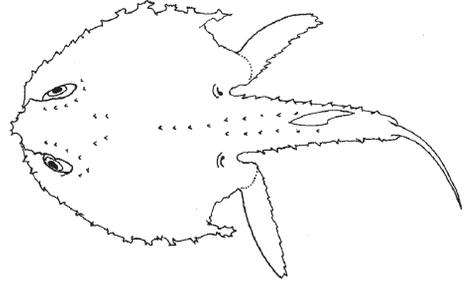
Meso- and bathypelagic anglerfish families: pelvic fins absent; second and third dorsal-fin spines greatly reduced or absent.



**Lophichthyidae**



**Chaunacidae**



**Ogcocephalidae**

**Key to the genera of Antennariidae occurring in the area**

- 1a. Skin of body smooth, appearing naked (dermal spinules, if present, difficult to detect without microscopic aid) . . . . . → 2
- 1b. Skin of body rough, everywhere covered with spinules. . . . . → 4
  
- 2a. Pectoral-fin lobe free from body; pelvic fins long, greater than 25% standard length; pelagic fin floating sargassum weed . . . . . *Histrio*
- 2b. Pectoral-fin lobe broadly connected to body; pelvic fins short, considerably less than 25% standard length; benthic in coral or rocky reefs, or on muddy or sandy bottoms . . . . . → 3
  
- 3a. Second and third dorsal-fin spine free, not bound to surface of cranium by skin of head; membranous posteriormost margin of soft dorsal and anal fins terminating at base of caudal fin . . . . . *Nudiantennarius*
- 3b. Second and third dorsal-fin spine hidden, laid back and bound to surface of cranium by skin of head; membranous posteriormost margin of soft-dorsal and anal fins extending posteriorly beyond base of caudal fin and connected to outermost caudal rays . . . . . *Histiophryne*
  
- 4a. Pectoral-fin lobe free from side of body; all rays of caudal fin simple (extreme distal tip of dorsalmost caudal-fin ray bifurcate in some specimens) . . . . . *Tathicarpus*
- 4b. Pectoral-fin lobe broadly attached to side of body; all or at least 7 innermost rays of caudal fin bifurcate . . . . . → 5
  
- 5a. A row of 2 to 4 translucent to transparent ocelli on membranes between rays of caudal fin . . . . . *Lophiocharon*
- 5b. Translucent or transparent ocelli on membranes of caudal fin absent . . . . . → 6

- 6a.** First dorsal-fin spine (illicium) tapering to a fine point, bait (esca) absent or only barely distinguishable; third dorsal-fin spine immobile, bound down to surface of cranium by skin of head . . . . . *Antennatus*
- 6b.** A conspicuous bait (esca) present; third dorsal-fin spine mobile, not bound down to surface of cranium by skin of head . . . . . *Antennarius*

#### List of species occurring in the area

- Antennarius analis* (Gosline *in* Schultz, 1957)  
*Antennarius biocellatus* (Cuvier, 1817)  
*Antennarius coccineus* (Cuvier *in* Lesson, 1831)  
*Antennarius commersoni* (Latreille, 1804)  
*Antennarius dorehensis* Bleeker, 1859  
*Antennarius hispidus* (Bloch and Schneider, 1801)  
*Antennarius maculatus* (Desjardins, 1840)  
*Antennarius nummifer* (Cuvier, 1817)  
*Antennarius pictus* (Shaw and Nodder, 1794)  
*Antennarius randalli* Allen, 1970  
*Antennarius rosaceus* Smith and Radcliffe *in* Radcliffe, 1912  
*Antennarius scriptissimus* Jordan *in* Jordan and Sindo, 1902 (= *A. sarasa* Tanaka, 1916)  
*Antennarius striatus* (Shaw and Nodder, 1794)
- Antennatus tuberosus* (Cuvier, 1817)
- Histiophryne bougainvilli* (Valenciennes, 1837)  
*Histiophryne cryptacanthus* (Weber, 1913)
- Histrion histrio* (Linnaeus, 1758)
- Lophiocharon lithinostomus* (Jordan and Richardson, 1908)  
*Lophiocharon trisignatus* (Richardson, 1844)
- Nudiantennarius subteres* Smith and Radcliffe *in* Radcliffe, 1912
- Tathicarpus butleri* Ogilby, 1907

#### References

- Pietsch, T.W. 1984. The genera of frogfishes (family Antennariidae). *Copeia*, 1984(1):27-44.
- Pietsch, T.W. and D.B. Grobecker. 1987. *Frogfishes of the world: systematics, zoogeography, and behavioral ecology*. Stanford, California, Stanford University Press, 420 p.

## TETRABRACHIIDAE

### Doublefin frogfish (anglerfish)

by T.W. Pietsch

**Diagnostic characters:** Body elongate, strongly compressed. **Mouth small, opening dorsally**, lower lip lined with small, cutaneous appendages. Jaws with 1 or 2 rows of small, recurved teeth. **Eyes small, close-set, protruding from dorsal surface of head.** **Opercular (gill) opening restricted to a small pore** located behind and below pectoral-fin base. Spinous dorsal fin of III spines, widely separated from soft part of fin. **First dorsal-fin spine (illicium) free from rest of fin, reduced, without terminal bait (esca);** second dorsal-fin spine also free from rest of fin, reduced, covered with cutaneous appendages; third dorsal-fin spine nearly completely covered with skin of head. **Pectoral fins divided into dorsal portion of 4 rays interconnected by membrane, and ventral portion of 5 interconnected rays;** dorsalmost ray of ventral portion membranously attached to side of body; pectoral-fin lobe membranously attached to rays of pelvic fins. Skin smooth, naked. **Colour:** in preservation white on lower half of head and body to brown on upper half, with numerous, small, white spots continuing onto soft dorsal fin, remaining fins white; oral cavity and viscera unpigmented.

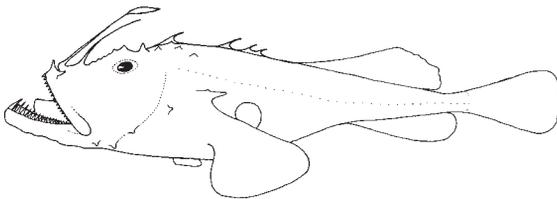


**Habitat, biology, and fisheries:** Habitat and biology unknown, but presumably similar to other benthic, shallow-water anglerfishes, which, despite their sedentary nature, are voracious carnivores that sit quietly waiting for smaller fishes to pass, engulfing anything that gets close enough to their mouths. Unlike most other anglerfishes, they lack a bait at the tip of the first dorsal-fin spine and thus apparently do not lure their prey. The ovaries are tightly rolled like a double scroll, and eggs are released embedded in a single, large, buoyant gelatinous mass. Rare in collections, *Tetrabrachium ocellatum* apparently does not exceed 8 cm total length. It is of no economic interest in the Western Central Pacific where it is caught incidentally in bottom trawls.

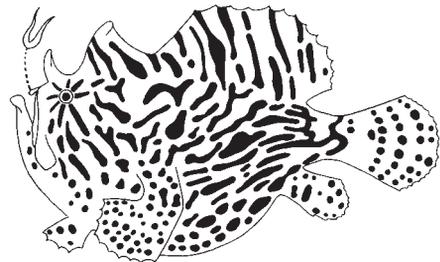
#### Similar families occurring in the area

Lophiidae: body greatly depressed (flattened dorsoventrally), not globose; pectoral fins single, rays not attached to side of body; pectoral-fin lobe not attached to rays of pelvic fins.

Antennariidae: pectoral fins single, rays not attached to side of body; pectoral-fin lobe not attached to rays of pelvic fins; body short, deep, laterally compressed.



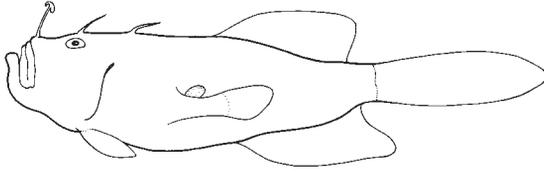
Lophiidae



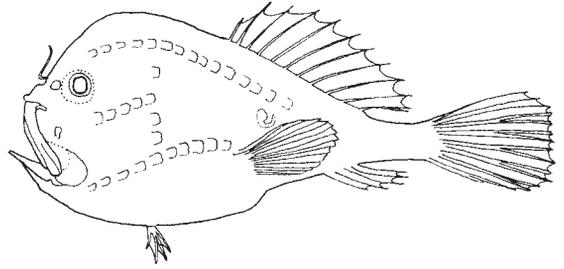
Antennariidae

Lophichthyidae: pectoral fins single, rays not attached to side of body; pectoral-fin lobe not attached to rays of pelvic fins; second and third dorsal-fin spines widely separated, not connected by membrane, not enveloped by thick skin.

Chaunacidae: pectoral fins single, rays not attached to side of body; pectoral-fin lobe not attached to rays of pelvic fins; second and third dorsal-fin spines reduced and embedded beneath skin; pelvic fins of I spine and 4 rays; body globose, slightly compressed.



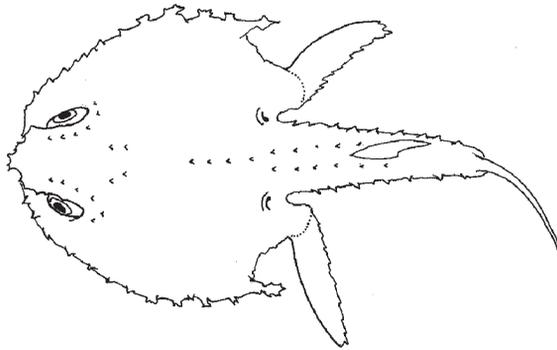
**Lophichthyidae**



**Chaunacidae**

Ogcocephalidae: body greatly depressed, not globose; pectoral fins single, rays not attached to side of body; pectoral-fin lobe not attached to rays of pelvic fins; remnant of second dorsal-fin spine embedded beneath skin, third dorsal-fin spine absent.

Bathypelagic anglerfish families: pelvic fins absent; pectoral fins single, rays not attached to side of body; pectoral-fin lobe not attached to rays of pelvic fins; second and third dorsal-fin spines greatly reduced or absent.



**Ogcocephalidae**

#### **A single species occurring in the area**

*Tetrabrachium ocellatum* Günther, 1880

#### **Reference**

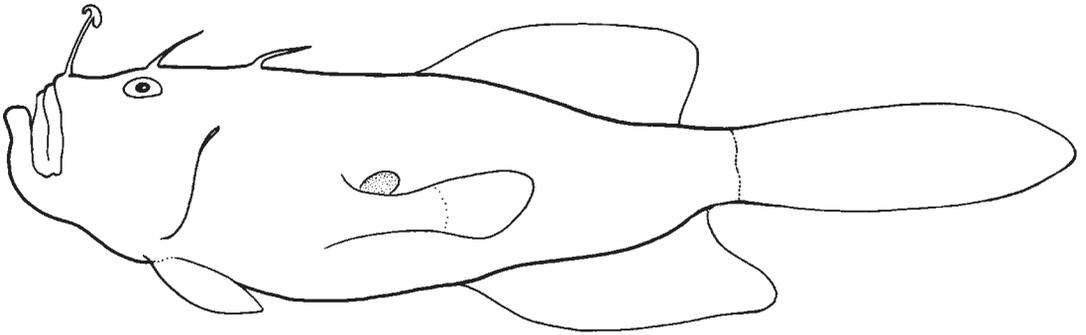
Pietsch, T.W. 1981. The osteology and relationships of the anglerfish genus *Tetrabrachium* with comments on lophiiform classification. *U.S. Fish. Bull.*, 79(3):387-419.

## LOPHICHTHYIDAE

### Boschma's frogfish (anglerfish)

by T.W. Pietsch

**Diagnostic characters:** Body elongate, compressed. **Mouth large, opening oblique to vertical,** lower lip without small, cutaneous appendages. Jaws with 1 or 2 rows of small, recurved teeth. Eyes small, dorsolateral in position. **Opercular (gill) opening restricted to a small pore** located at the end of a short tube, behind and above pectoral-fin base. **Spinous dorsal fin of III, slender spines, widely separated from each other and from soft part of dorsal fin.** **First dorsal-fin spine (illicium) with a well-developed terminal bait (esca),** the second and third free, not enveloped by thick skin. **Pectoral-fin lobe elongate, leg-like;** fin single, not divided into upper and lower portions. Skin with numerous, small cutaneous appendages; skin of dorsal and lateral surfaces of head and body spinulose. **Colour:** in preservation white on belly to light pink on the lateral and dorsal surfaces of head and body, with slightly darker brown reticulate pattern on upper part of body; membranes of fins (except those of the caudal fin) dark brown, with closely spaced white spots; oral cavity and viscera unpigmented.

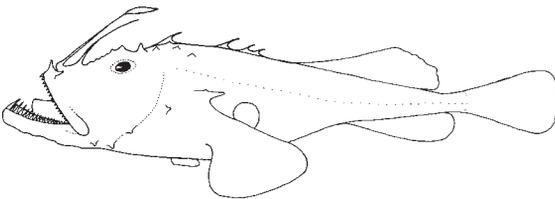


**Habitat, biology, and fisheries:** Habitat and biology unknown, but presumably similar to other benthic, shallow-water anglerfishes, which, despite their sedentary nature, are voracious carnivores that sit quietly waiting for smaller fishes to pass by at which time they enticingly wriggle their bait to attract the potential prey to their mouths. Their ovaries are tightly rolled like a double scroll, and eggs are released embedded in a single, large, buoyant gelatinous mass. Rare in collections, it apparently does not exceed 7.5 cm total length. It is of no significant economic interest in the Western Central Pacific where it is caught incidentally in bottom trawls.

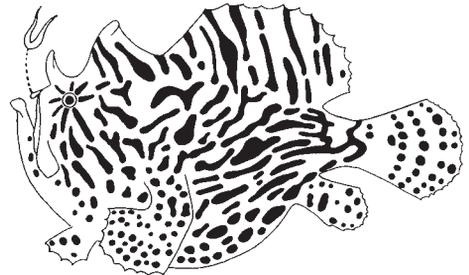
#### Similar families occurring in the area

Lophiidae: body greatly depressed (flattened dorso-ventrally), not globose.

Antennariidae: spines of dorsal fin closely associated with each other, second and third dorsal-fin spines enveloped by thick skin; body short, deep, laterally compressed.



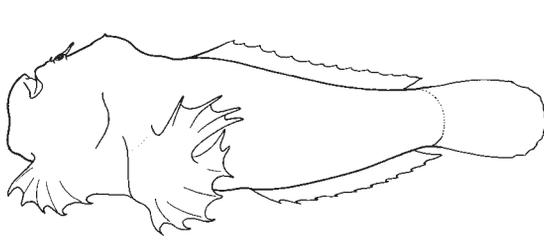
**Lophiidae**



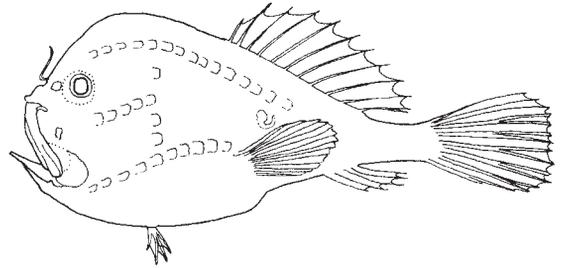
**Antennariidae**

Tetrabrachiidae: pectoral fin double, dorsal most ray of ventral portion membranously attached to side of body; pectoral-fin lobe membranously attached to rays of pelvic fin; body elongate, strongly compressed.

Chaunacidae: second and third dorsal-fin spines reduced and embedded beneath skin; pelvic fins of I spine and 4 rays; body globose, slightly compressed.



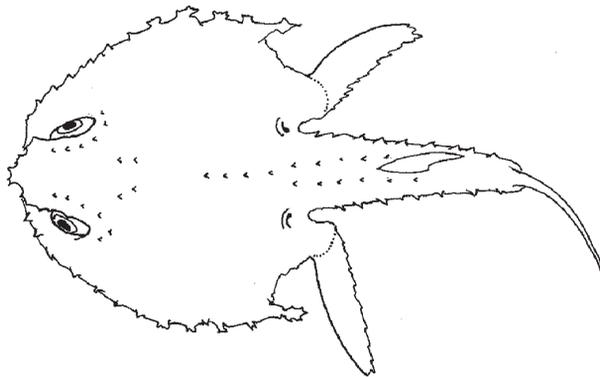
**Tetrabrachiidae**



**Chaunacidae**

Ogcocephalidae: remnant of second dorsal-fin spine embedded beneath skin, third dorsal-fin spine absent; body greatly depressed, not globose.

Bathypelagic anglerfish families: pelvic fins absent; second and third dorsal-fin spines greatly reduced or absent.



**Ogcocephalidae**

#### **A single species occurring in the area**

*Lophichthys boschmai* Boeseman, 1964

#### **References**

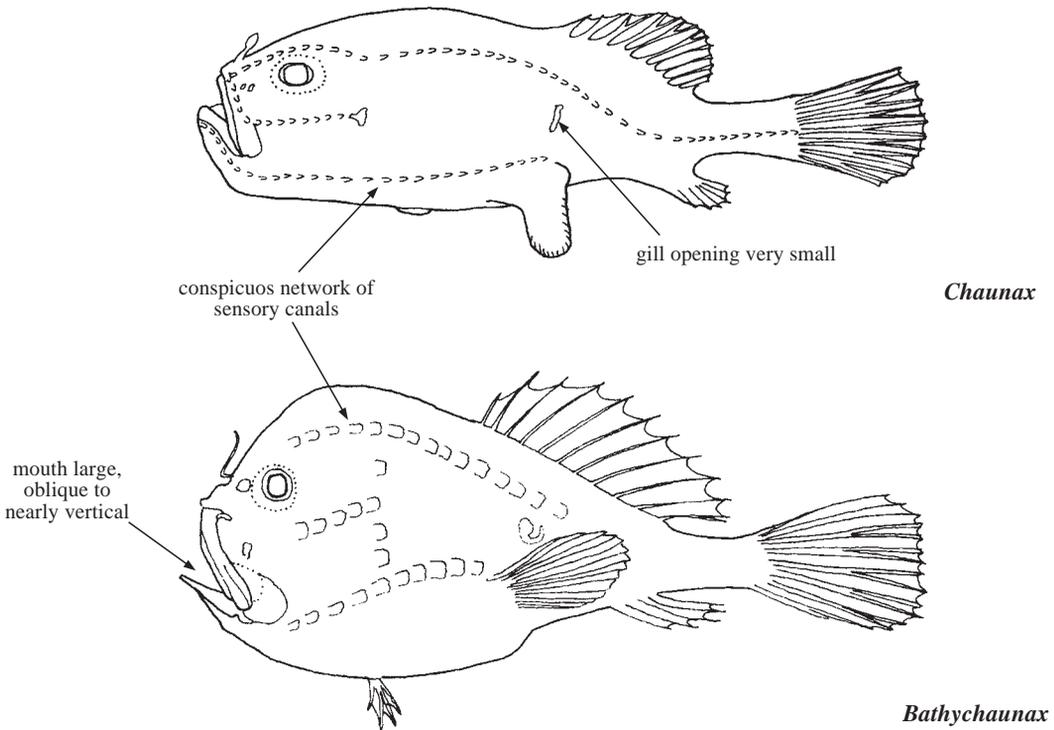
- Boeseman, M. 1964. Notes on the fishes of western New Guinea II. *Lophichthys boschmai*, a new genus and species from the Arafoera Sea. *Zool. Med. Leiden*, 39:12-18.
- Pietsch, T.W. 1981. The osteology and relationships of the anglerfish genus *Tetrabrachium* with comments on lophiiform classification. *U.S. Fish. Bull.*, 79(3):387-419.

## CHAUNACIDAE

### Sea toads (gapers)

by J.H. Caruso

**Diagnostic characters:** Head and anterior part of body rounded or cuboid, posterior portion of body tapering. Conspicuous network of open sensory canals present on head continuous with single open lateral-line canal on body and proximal portion of caudal fin; **rounded tips of neuromasts visible within open canals**. **Skin very loose and flaccid, densely covered with minute, spine-like scales** that are somewhat similar both in shape and feel to the placoid scales of some sharks. **Mouth large and oblique to nearly vertical**, upper jaw protractile and the lower projecting, **both bearing numerous short villiform teeth**. **Gill openings very small**, located well above pectoral axil. Dorsal fin consists of only III very short, disjunct cephalic spines only **the anteriormost of which (the illicium) is visible, located at the tip of the snout, and modified as an angling apparatus, bearing a terminal bait or esca comprising a dense cluster of short cirri, giving the apparatus the appearance of a short-handled mop**. **Illicium depressible and retractable into an ovoid, scaleless, patch or depression immediately behind it**. Single soft dorsal fin with 10 to 12 rays; anal fin below second dorsal fin, with 5 to 7 rays; **pectoral fins narrow and paddle-like**, with 10 to 15 unbranched rays; pelvic fins on ventral surface of head anterior to pectoral fins, with 1 spine and 4 rays, mostly covered with loose skin; caudal fin with 8 rays, 2 outer rays unbranched, others branched. **Colour:** most species with ground colour of red-orange or rose, many species with spots or small blotches of contrasting colour (e.g. yellow, yellow-green).



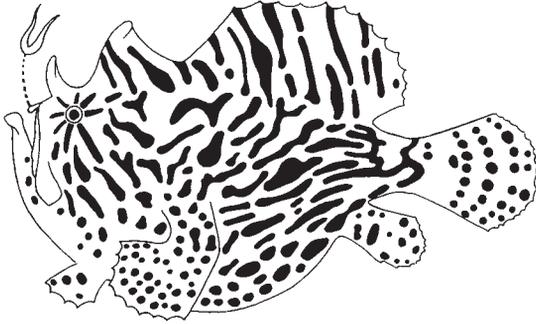
**Habitat, biology, and fisheries:** Chaunacids are bottom dwellers on the continental slope, usually at depths in excess of 200 m (some species are found beyond 2 500 m). Some species are marketed for human consumption in the northern part of the area.

**Remarks:** The taxonomic status of the Indo-Pacific members of the genus *Chaunax* is at present uncertain. At least 3 of the 6 nominal species that have been described from the area appear to be valid. *Chaunax tosaensis* appears to be a synonym of *C. penicillatus*; *C. abei*, *C. breviradius*, and *C. endeavouri* appears to represent at least 2 distinct species, 1 of which may be a synonym of *C. fimbriatus*.

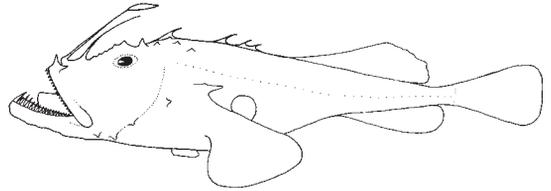
### Similar families occurring in the area

**Antennariidae:** body short, deep, globose, slightly compressed; teeth small, villiform; head with 3 disjunct dorsal-fin spines, the anteriormost, the angling apparatus, usually bears well-developed terminal esca (bait); mouth large with numerous small, villiform teeth.

**Lophiidae:** head and body strongly depressed; head with 2 or 3 long slender dorsal-fin spines, the anteriormost, the angling apparatus, usually bears a simple or elaborate fleshy esca (bait); mouth very large and upwardly directed with long, sharp, depressible teeth.



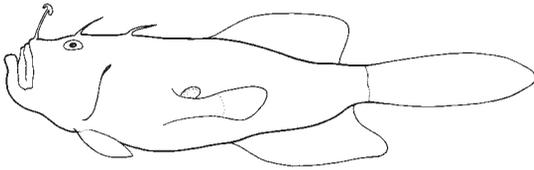
**Antennariidae**



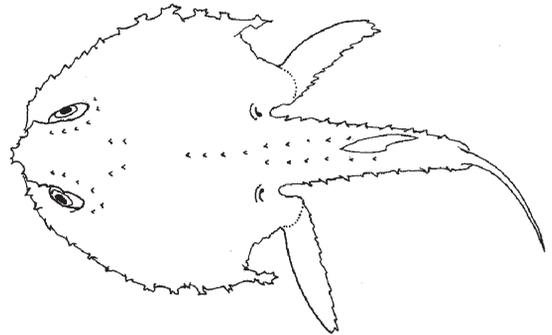
**Lophiidae**

**Lophichthyidae:** body compressed and elongate; second and third dorsal-fin spines widely separated, not connected by membrane, not enveloped by thick skin.

**Ogcocephalidae:** head and body strongly depressed; head devoid of long slender dorsal-fin spines; angling apparatus small, placed in a depression between snout tip and mouth; mouth very small, without long and sharp teeth.



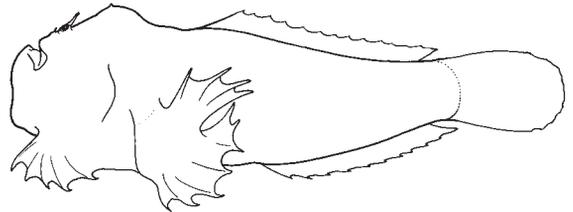
**Lophichthyidae**



**Ogcocephalidae**

**Tetrabrachiidae:** body strongly compressed and elongate; pectoral fin double, dorsalmost ray of ventral portion membranously attached to side of body; pectoral-fin lobe membranously attached to rays of pelvic fin.

**Meso- and bathypelagic anglerfish families:** body shape variable, but not depressed; no pelvic fins; second and third dorsal-fin spines greatly reduced or absent.



**Tetrabrachiidae**

### Key to the genera of Chaunacidae occurring in the area

- 1a.** Anal-fin rays 5 or 6 (usually 6); greatest distance between anterolateral angles of sphenotic bones (prominent bumps beneath skin behind eyes) 22 to 27% of standard length; 9 neuromasts in supraorbital row (A-B, Fig. 1), 1 neuromast in upper preopercular row (B-C, Fig. 1), 2 in lower preopercular row (C-D, Fig. 1), 3 in pectoral row (D-E, Fig. 1), 17 to 21 in lateral line (B-F, Fig. 1) . . . . . *Bathychaunax*
- 1b.** Anal-fin rays 6 or 7 (usually 7); greatest distance between anterolateral angles of sphenotic bones 15 to 23% of standard length; 10 to 13 neuromasts (usually 11) in supraorbital row (A-B, Fig. 2), 2 to 4 neuromasts in upper preopercular row (B-C, Fig. 2), 3 to 5 in lower preopercular row (C-D, Fig. 2), 10 to 13 in pectoral row (D-E, Fig. 2), 29 to 42 in lateral line (B-F, Fig. 2) . . . . . *Chaunax*

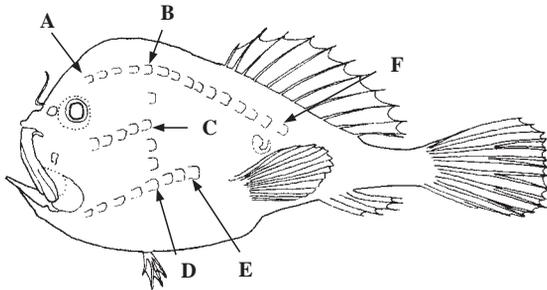


Fig. 1 *Bathychaunax*

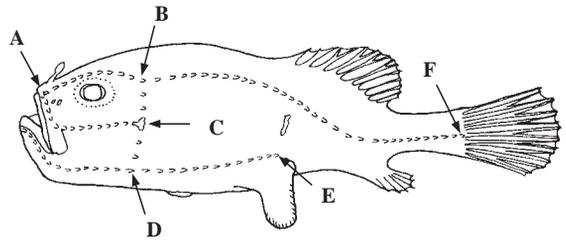


Fig. 2 *Chaunax*

### List of nominal species occurring in the area

- Bathychaunax coloratus* (Garman, 1899)  
*Bathychaunax melanostomus* Caruso, 1989  
*Chaunax abei* Le Danois, 1978  
*Chaunax breviradiatus* Le Danois, 1978  
*Chaunax endeavouri* Whitley, 1929  
*Chaunax fimbriatus* Hilgendorf, 1879  
*Chaunax penicillatus* McCulloch, 1915  
*Chaunax tosaensis* Okamura and Oryuu, 1984

### References

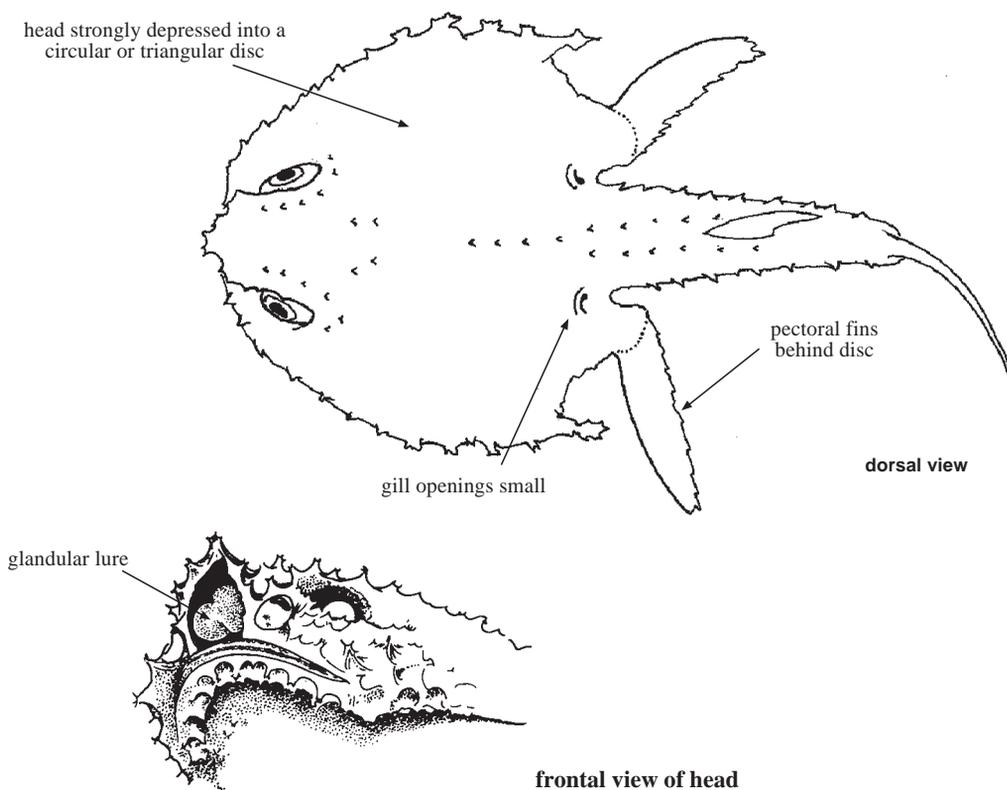
- Caruso, J.H. 1989. Systematics and distribution of the Atlantic chaunacid anglerfishes (Pisces: Lophiiformes). *Copeia*, 1989(1):153-165.
- Caruso, J.H. 1989. A review of the Indo-Pacific members of the deep-water chaunacid anglerfish genus *Bathychaunax*, with the description of a new species from the eastern Indian Ocean (Pisces: Lophiiformes). *Bull. Mar. Sci.*, 45(3):574-579.

## OGCOCEPHALIDAE

## Batfishes

by M.G. Bradbury

**Diagnostic characters:** Body with strongly depressed head disc (only *Coelophrys* with box-shaped body), circular or triangular in outline, and a short tail (size to 20 cm standard length, usually to 10 cm). **Above mouth, a cavity containing a movable glandular lure** (known to be part of a modified dorsal-fin spine). Eyes of moderate size, visible in dorsal view but directed anterodorsally. **Dorsal margin of cavity a protective rostrum formed of close-set tubercles.** Mouth terminal; in some genera, overhung by rostrum. Minute conical teeth in bands on jaws. Palatines and vomer with or without teeth. **Gill openings small, located in membrane in pectoral axils, directed dorsally.** Branchiostegals 6. Dorsal fin small, placed posterior to disc, with 4 to 7 soft rays, or fin absent. **Anal fin a small elongate fleshy lobe, always with 4 soft rays.** Caudal rounded, with 9 rays. **Pectoral fins splayed out posterior to disc, attached to elongate pedicels resembling “arms”,** usually with 12 to 16 soft rays. **Pelvic fins placed ventrally in centre of disc, thus anterior to pectoral fins,** with 1 spine and 5 soft rays. Scales highly modified to form conical tubercles, variable in size from minute prickles to large strong spiny structures. Lateral line represented by series of free neuromasts which appear as fleshy knobs, most prominent on ventral margins of disc and lateral sides of tail where they lie along the bottom of channels. **Colour:** preserved specimens usually pale; fresh specimens often pink to reddish; dark markings may be present on dorsal surface of disc in the form of reticula, rings, or blotches.



(after Bradbury, 1988)

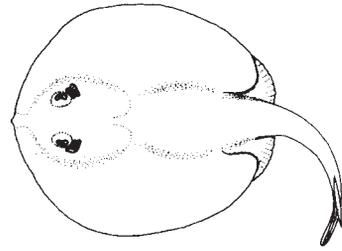
**Habitat, biology, and fisheries:** Demersal, offshore on continental shelves and upper continental slopes. Stomach contents primarily pelecypods, gastropods, polychaetes, amphipods, and other small crustaceans, occasionally small fishes. The function of the glandular lure is unclear. However, some workers hypothesize it to be a chemical lure, its contents squirted out when it is fluttered over the mouth. Ogcocephalids are incidentally (but frequently) taken in fishery operations.

**Similar families occurring in the area**

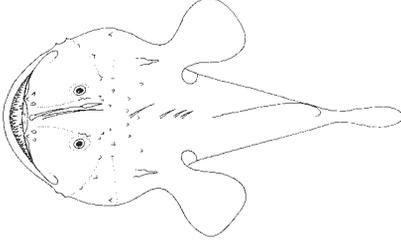
**Urolophidae** (and other batoid fishes): distinguished from batfishes by having 5 pairs of gill openings on ventral surface of disc and by having pelvic fins posterior to pectoral fins, not situated ventrally on centre of disc.

**Lophiidae**: tubercles or scales entirely absent; although lophiids have lures, these are attached to long spines on the front of the head, not nested in cavities over the mouth.

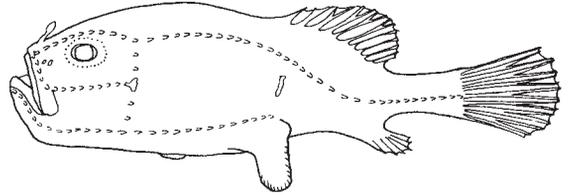
**Chaunacidae**: body not compressed, but rounded or cuboid; mouth large and oblique to nearly vertical; first dorsal-fin spine visible on snout, modified as an angling apparatus.



**Urolophidae**



**Lophiidae**

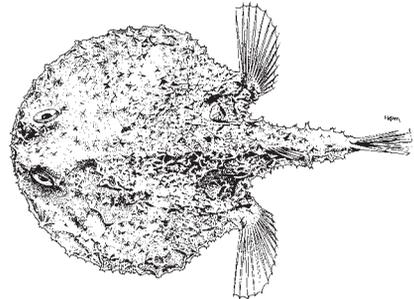


**Chaunacidae**

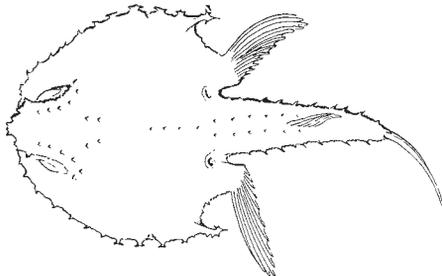
**Key to the genera of Ogcocephalidae**

Note: the genus *Coelophrys* could not be accommodated into this key; species of this genus would key out with *Halieutopsis* and are distinguished from all but *Halieutopsis micropa* by their box-shaped (instead of depressed) bodies and tiny pelvic fins. In their general appearance, they look similar to members of the family Chaunacidae.

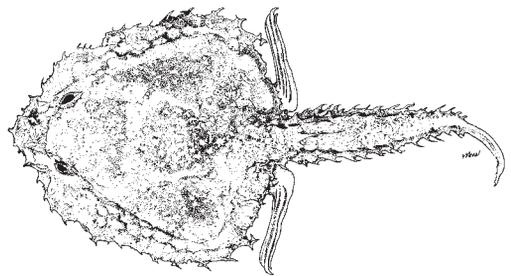
- 1a. No teeth on palatines. . . . . → 2
- 1b. Pads of teeth on vomer and palatines . . . → 4
- 2a. Gills 2 1/2 (i.e. hemibranch present on fourth arch) (Fig. 1) . . . . . ***Halieutaea***
- 2b. Gills 2 (no hemibranch on fourth arch). . . → 3
- 3a. Large pads of teeth on each ceratobranchial 5, the 2 pads meeting along midline, forming a broad toothed "tongue" (Fig. 2). . . . . ***Dibranchus***
- 3b. No teeth on ceratobranchial 5, or small pads of teeth present surrounded by epithelium, not meeting along midline (Fig. 3) . . ***Halieutopsis***



**Fig. 1 *Halieutaea***



**Fig. 2 *Dibranchus***



**Fig. 3 *Halieutopsis***

- 4a. Tubercles on front of disc forming a short conical rostrum overhanging lure and mouth; dorsal fin present (Fig. 4) . . . . . *Malthopsis*
- 4b. Rostrum a narrow shelf pushed back on head so mouth and lure are seen in dorsal view; dorsal fin often absent (Fig. 5) . . . . . *Halicmetus*

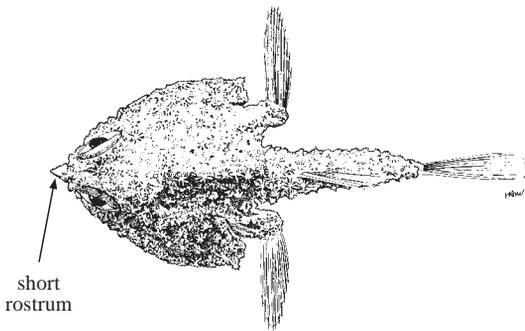


Fig. 4 *Malthopsis*

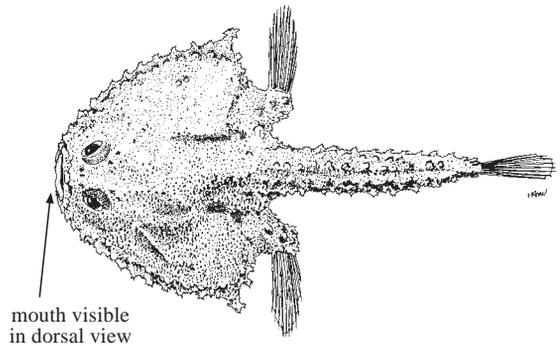


Fig. 5 *Halicmetus*

**List of species occurring in the area**

Note: *Halieutaea* needs revision and most species distributions are little known. There are probably 5 or 6 species to be expected in the area.

- Coelophrys arca* Smith and Radcliffe, 1912
- Coelophrys breviceps* Smith and Radcliffe, 1912
- Coelophrys mollis* Smith and Radcliffe, 1912
- Dibranchius japonicus* Amaoka and Toyoshima, 1981
- Dibranchius hystrix* Garman, 1899
- Dibranchius stellulatus* Gilbert, 1905
- Halieutaea brevicauda* Ogilby, 1910
- Halieutaea coccinea* Alcock, 1889
- Halieutaea fumosa* Alcock, 1894
- Halieutaea nigra* Alcock, 1891
- Halieutaea stellata* (Vahl, 1797)
- Halicmetus reticulatus* Smith and Radcliffe, 1912
- Halicmetus ruber* Alcock, 1891
- Halieutopsis bathyoreos* Bradbury, 1988
- Halieutopsis micropa* (Alcock, 1891)
- Halieutopsis stellifera* (Smith and Radcliffe, 1912)
- Halieutopsis simula* (Smith and Radcliffe, 1912)
- Halieutopsis vermicularis* Smith and Radcliffe, 1912
- Malthopsis luteus* Alcock, 1891
- Malthopsis mitrigera* Gilbert and Cramer, 1897

**References**

Bradbury, M.G. 1988. Rare fishes of the deep-sea genus *Halieutopsis*: A review with descriptions of four new species (Lophiiformes: Ogcocephalidae). *Fieldiana Zool.* (n. s.), (44):22 p.

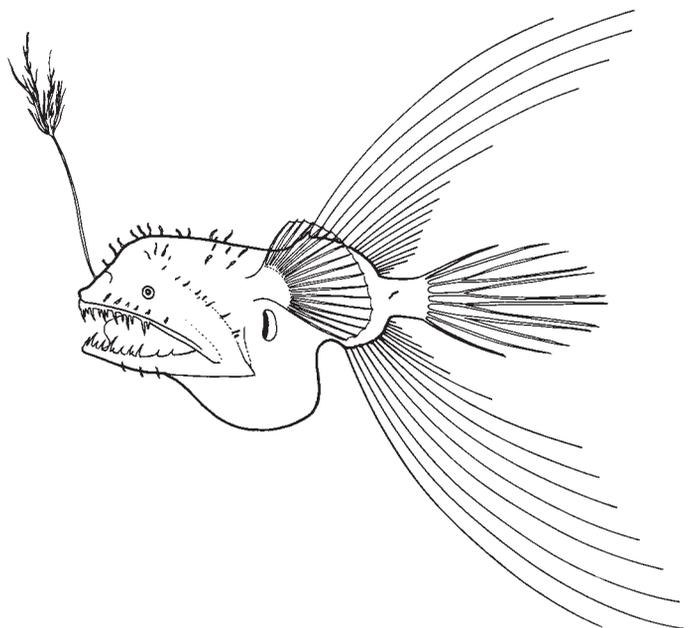
Masuda, H., K. Amaoka, C. Araga, T. Uyeno, and T. Yoshino (eds). 1984. *The fishes of the Japanese Archipelago*. Tokyo, Tokai University Press, 437 p. (Vol. 1), 370 pls (Vol. 2).

## CAULOPHRYNIDAE

### Fanfin anglerfishes (deepsea anglerfishes)

by T.W. Pietsch

**Diagnostic characters:** Characterized by extreme sexual dimorphism in which males are dwarfed and reach only a fraction of the size of females. Soft dorsal fin with 6 to 22 rays; anal fin with 5 to 19 rays; **caudal-fin rays 8**. Females with body short, globose; **first dorsal-fin spine (illicium) shorter than standard length, usually bearing slender cutaneous filaments along its length and numerous branched filaments at its terminus, but lacking a bulbous, bacteria-filled bioluminescent bait (esca); dorsal- and anal-fin rays extremely long; neuromasts of acoustico-lateralis system located at tips of extremely long filaments. Adult males parasitic on females**, with skin naked and denticular teeth of upper and lower jaw fused at base. **Larvae and free-living males with well-developed pelvic fins**; parasitic males and metamorphosed and adult females with pelvic fins absent. **Colour:** dark brown to black over entire surface of head, body, fins (except for distal portion of bait and sometimes first dorsal-fin spine), and oral cavity; viscera unpigmented.



**Habitat, biology, and fisheries:** Solitary, meso- and bathypelagic anglerfishes: females passively attracting prey by means of a first dorsal-fin spine modified to serve as a luring device; males actively seeking mates by means of highly developed sense organs, attaching themselves to the females by means of specialized tooth-bearing denticles born on the tips of the jaws and becoming parasitic through fusion of tissue and apparently blood vessels. Females attaining a length of 17 cm, males 1.6 cm. They are of no economic interest.

#### Similar families occurring in the area

Other meso- and bathypelagic anglerfish families: caulophrynids are easily distinguished by having extremely long dorsal- and anal-fin rays, a luring apparatus that lacks a bulbous, bacteria-filled bioluminescent bait, and neuromasts of the acoustico-lateralis system located at the tips of extremely long cutaneous filaments.

#### List of species occurring in the area

*Caulophryne pelagica* (Brauer, 1902)

*Robia legula* Pietsch, 1979

#### Reference

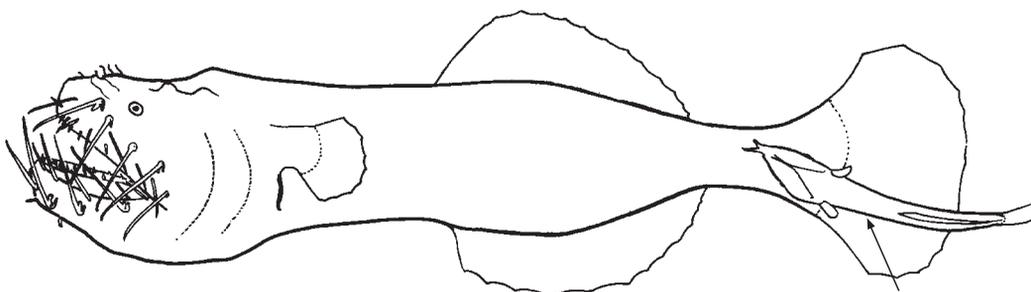
Pietsch, T.W. 1979. Ceratioid anglerfishes of the family Caulophrynidae with the description of a new genus and species from the Banda Sea. *Contrib. Sci., Nat. Hist. Mus. Los Angeles Co.*, (310):25 p.

## NEOCERATIIDAE

### Neoceratiid anglerfishes (deepsea anglerfishes)

by T.W.Pietsch

**Diagnostic characters:** Characterized by extreme sexual dimorphism in which males are dwarfed and reach only a fraction of the size of females. **Soft dorsal fin with 11 to 13 rays; anal fin with 10 to 13 rays; pelvic fins absent.** Females with body slender, elongate, slightly compressed; cleft of mouth horizontal, extending posteriorly beyond eyes; **2 or 3 series of mobile, hooked teeth on outer margin of jaws; first dorsal-fin spine (luring apparatus) absent; bioluminescent structures apparently absent;** lower jaw extending slightly beyond upper jaw; **a pair of prominent nasal papillae;** skin naked. **Adult males parasitic on females;** eyes and olfactory organs degenerate; lower denticular triradiate, each projection terminating in a double hook; upper denticular teeth absent; skin naked. **Colour:** dark red-brown to black over entire surface of head, body, and fins.



males smaller than and parasitic on females  
(attachment site variable; some females without  
attached males, some with multiple males)

**Habitat, biology, and fisheries:** Solitary, meso- and bathypelagic anglerfishes. Females feeding in some unknown way (luring apparatus, and apparently bioluminescent structures, absent), perhaps snagging soft-bodied, passive invertebrates with their elongate, hooked, external jaw teeth; males actively seeking mates by means of highly developed sense organs, attaching themselves to the females by means of specialized tooth-bearing denticles born on the tips of the jaws and becoming parasitic through fusion of tissue and apparently blood vessels. Females attaining a length of 7.5 cm, males 1.9 cm. They are of no economic interest.

#### Similar families occurring in the area

Other meso- and bathypelagic anglerfish families. Neoceratiids are easily distinguished by having a slender, elongate, slightly compressed body; 2 or 3 series of mobile, hooked teeth on outer margin of jaws; first dorsal-fin spine (luring apparatus) absent; a pair of prominent nasal papillae; skin naked.

#### A single species occurring in the area

*Neoceratias spinifer* Pappenheim, 1914

#### Reference

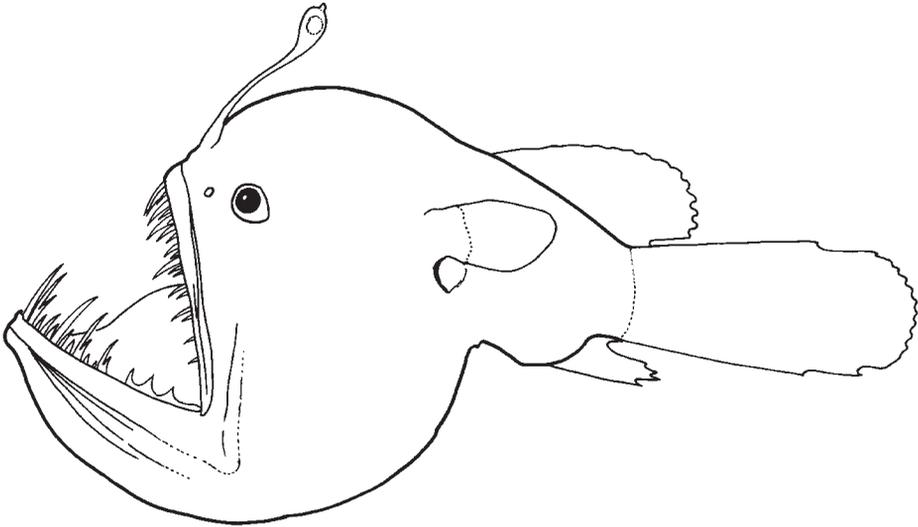
Bertelsen, E. 1951. The ceratioid fishes. Ontogeny, taxonomy, distribution, and biology. *Dana Rept.*, (39):276 p.

## MELANOCETIDAE

### Blackdevils (deepsea anglerfishes)

by T.W. Pietsch

**Diagnostic characters:** Characterized by extreme sexual dimorphism in which males are dwarfed and reach only a fraction of the size of females. **Soft dorsal fin with 12 to 17 rays; anal fin with 4 rays (very rarely 3 or 5); pelvic fins absent.** Females with body short, deep, globose; **first dorsal-fin spine (illicium) short, less than 70% length of head and body, bearing a conspicuous terminal bioluminescent bait (esca); bait without filaments or appendages;** snout and chin smooth, without papillae, equal anteriorly; sphenotic spines absent; skin smooth, appearing naked. **Males free-living, not becoming parasitic on females,** with eyes large, elliptical, directed laterally; olfactory organs large; skin spinulose; a median series and 2 or 3 transverse series of denticular teeth on snout, all fused at base; lower denticular teeth in a median and 2 lateral groups fused at base. **Colour:** dark brown to black over entire surface of head and body (except for distal portion of bait); fins colourless in adolescent females.



**Habitat, biology, and fisheries:** Solitary, meso- and bathypelagic anglerfishes. Females passively attracting prey by means of a first dorsal-fin spine modified to serve as a luring device; males actively seeking mates by means of highly developed sense organs, apparently attaching themselves to the females by means of specialized tooth-bearing denticles born on the tips of the jaws, but not becoming parasitic. Females attaining a length of 12 cm, males 2.8 cm. They are of no economic interest.

#### Similar families occurring in the area

Other meso- and bathypelagic anglerfish families: melanocetids are distinguished by having a combination of features that includes a short, deep, globose body; a long dorsal fin containing 12 to 17 rays; a short anal fin with 4 rays (very rarely 3 or 5); sphenotic spines absent; skin smooth, appearing naked.

#### List of species occurring in the area

*Melanocetus johnsoni* Günther, 1864

*Melanocetus murrayi* Günther, 1887

#### Reference

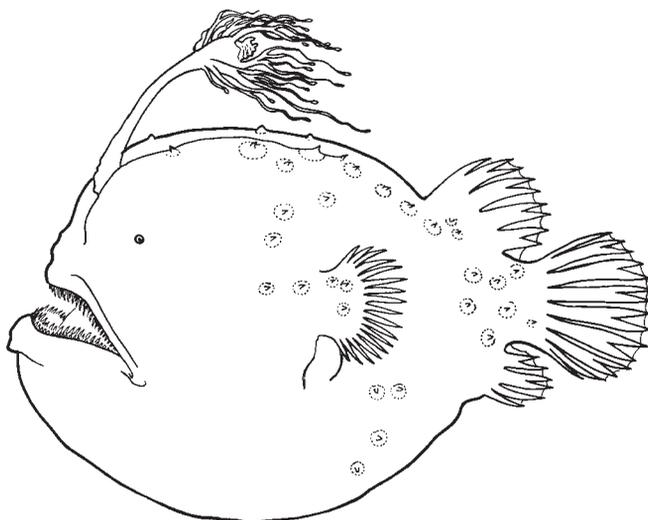
Pietsch, T.W. and J.P. Van Duzer. 1980. Systematics and distribution of ceratioid anglerfishes of the family Melanocetidae with the description of a new species from the Eastern North Pacific Ocean. *U.S. Fish. Bull.*, 78(1):59-87.

## HIMANTOLOPHIDAE

### Footballfishes (deepsea anglerfishes)

by T.W. Pietsch

**Diagnostic characters:** Characterized by extreme sexual dimorphism in which males are dwarfed and reach only a fraction of the size of females. Soft dorsal fin with 5 or 6 rays; anal fin with 4 or 5 rays; **pelvic fins absent**. Females with body short, deep, globose; **first dorsal-fin spine (illicium) stout, short, less than head length to nearly equal to length of head and body, bearing a conspicuous terminal bioluminescent bait (esca)**; snout and chin blunt, equal anteriorly, and usually covered with small rounded papillae; sphenotic spines present; **skin of head and body with widely spaced, bony plates, each bearing a median spine**. **Males free-living, not becoming parasitic on females**; eyes large, directed laterally; olfactory organs large, skin spinulose; denticular teeth on upper and lower jaw in 2 to 4 transverse series, fused at base. **Colour:** dark brown to black over entire surface of head, body, fins (except for distal portion of bait), and oral cavity; irregular, white or faintly pigmented patches sometimes present on the snout, chin, and upper surface of the head and body.



**Habitat, biology, and fisheries:** Solitary, meso- and bathypelagic anglerfishes. Females passively attracting prey by means of a first dorsal-fin spine modified to serve as a luring device; males actively seeking mates by means of highly developed sense organs, apparently attaching themselves to the females by means of specialized tooth-bearing denticles born on the tips of the jaws, but not becoming parasitic. Females attaining a length of 46.5 cm, males 4 cm. They are of no economic interest.

#### Similar families occurring in the area

Other meso- and bathypelagic anglerfish families: himantolophids are distinguished by having a combination of characters that includes a short, deep, globose body; snout and chin blunt, equal anteriorly, and usually covered with small rounded papillae; sphenotic spines present; skin of head and body with widely spaced, bony plates, each bearing a median spine.

#### List of species occurring in the area

- Himantolophus cornifer* Bertelsen and Krefft, 1988
- Himantolophus danae* Regan and Trewavas, 1932
- Himantolophus nigricornis* Bertelsen and Krefft, 1988
- Himantolophus sagamius* (Tanaka, 1918)
- Himantolophus brevirostris* group (males only)
- Himantolophus rostratus* group (males only)

#### Reference

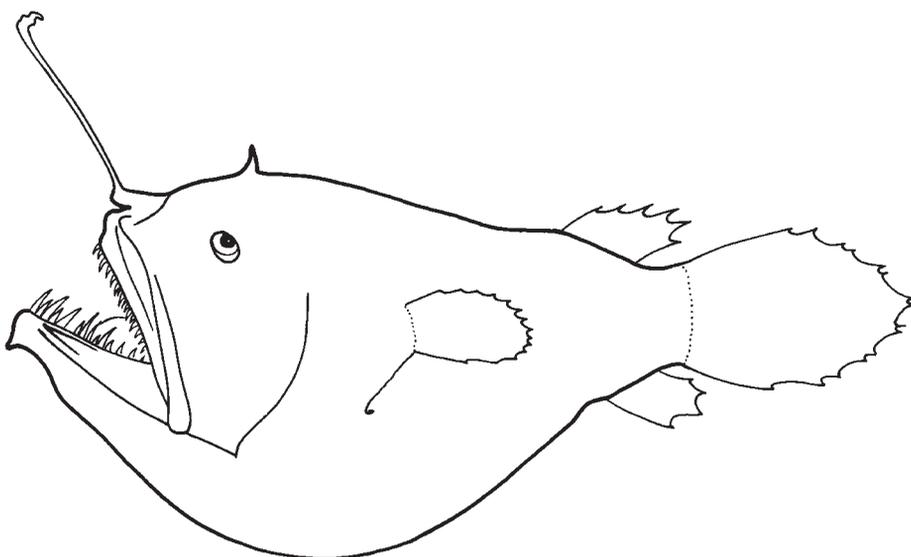
Bertelsen, E. and G. Krefft. 1988. The ceratioid family Himantolophidae (Pisces, Lophiiformes). *Steenstrupia*, 14(2):9-89.

## DICERATIIDAE

### Diceratid anglerfishes (deepsea anglerfishes)

by T.W. Pietsch

**Diagnostic characters:** Characterized by extreme sexual dimorphism in which males are dwarfed and reach only a fraction of the size of females. Soft dorsal fin with 5 to 7 rays; anal fin with 4 rays; **pelvic fins absent**. Females with body short, globose; **first dorsal-fin spine (illicium) less than 1/2 length of head and body to more twice this length, bearing a conspicuous terminal bioluminescent bait (esca); a short, exposed second dorsal-fin spine present** just behind base of first spine, bearing a terminal light organ; jaws equal anteriorly; strong sphenotic spines present; no caruncles on back; skin rough, everywhere covered with minute, close-set spinules. **Males free-living, not becoming parasitic on females;** eyes large; olfactory organs small, well separated from eye; a pair of slender, curved denticular teeth on snout, 9 similar denticular teeth on tip of lower jaw, all teeth mutually free without expanded connecting bases; skin spinulose. **Colour:** dark brown to black over entire surface of head, body, fins (except for distal portion of bait), and oral cavity.



**Habitat, biology, and fisheries:** Solitary, meso- and bathypelagic anglerfishes. Females passively attracting prey by means of a first dorsal-fin spine modified to serve as a luring device; males actively seeking mates by means of highly developed sense organs, apparently attaching themselves to the females by means of specialized tooth-bearing denticles born on the tips of the jaws, but not becoming parasitic. Females attaining a length of 23.5 cm, males 1.4 cm. They are of no economic interest.

#### Similar families occurring in the area

Other meso- and bathypelagic anglerfish families: diceratiids are distinguished by having a combination of characters that includes a short, globose body; an exposed second dorsal-fin spine situated just behind base of first spine, bearing a terminal light organ; strong sphenotic spines; skin everywhere covered with minute, close-set spinules.

#### List of species occurring in the area

*Diceratias bispinosus* (Günther, 1887)

*Phrynichthys thele* Uwate, 1979

#### Reference

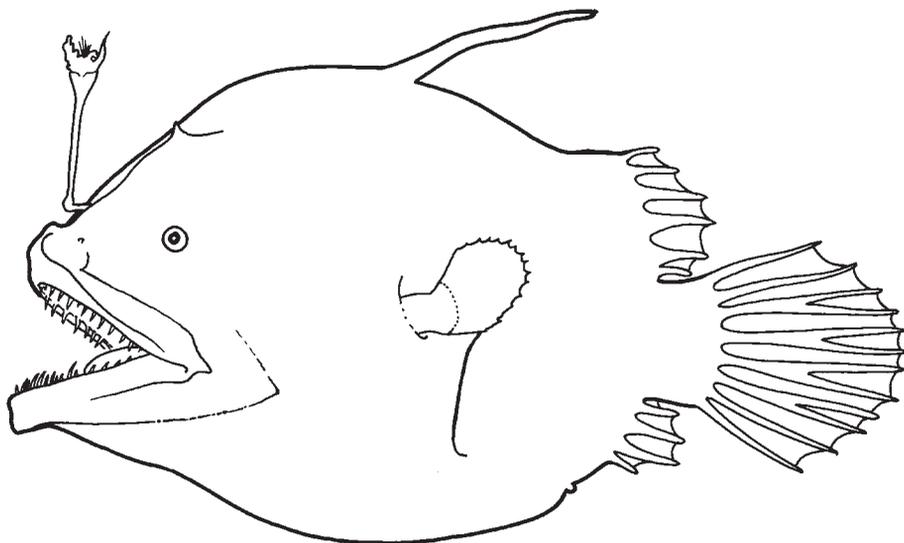
Uwate, K.R. 1979. Revision of the anglerfish family Diceratiidae, with descriptions of two new species. *Copeia*, 1979(1):129-144.

## ONEIRODIDAE

## Dreamers (deepsea anglerfishes)

by T.W. Pietsch

**Diagnostic characters:** Characterized by extreme sexual dimorphism in which males are dwarfed and reach only a fraction of the size of females. **Soft dorsal fin with 4 to 8 rays; anal fin with 4 to 7 rays;** pelvic fins absent. Females highly variable in shape, with body short, globose to elongate, slender, and compressed; first dorsal-fin spine (illicium) extremely short (bait nearly sessile on snout) to longer than total length of fish, bearing a conspicuous terminal bioluminescent bait (esca); **second dorsal-fin spine not exposed, embedded beneath skin of head; jaws equal anteriorly; strong sphenotic spines usually present** (absent in *Chaenophryne*); **no caruncles on back; skin usually smooth, appearing naked** (rough, everywhere covered with minute, close-set spinules in *Spiniphryne*). Males free-living, not becoming parasitic on females (except those of *Leptacanthichthys*); eyes large, directed laterally; olfactory organs large, anterior nostrils close together, directed anteriorly; skin naked. **Colour:** dark brown to black over entire surface of head, body, fins (except for distal portion of bait), and oral cavity.



**Habitat, biology, and fisheries:** Solitary, meso- and bathypelagic anglerfishes. Females passively attracting prey by means of a first dorsal-fin spine modified to serve as a luring device; males actively seeking mates by means of highly developed sense organs, apparently attaching themselves to the females by means of specialized tooth-bearing denticles born on the tips of the jaws, but not becoming parasitic (except for those of *Leptacanthichthys*). Females attaining a total length of 28 cm, males 1.8 cm. They are of no economic interest.

#### Similar families occurring in the area

Other meso- and bathypelagic anglerfish families: the numerous and highly diverse genera of the Oneirodidae are distinguished by having a combination of features that includes the first dorsal-fin spine emerging well behind the tip of the snout and bearing a well-developed bioluminescent bait; the second dorsal-fin spine greatly reduced, embedded beneath skin of the head; jaws equal anteriorly; no caruncles on back; no hyoid barbel; snout and chin smooth, not covered with close-set cutaneous papillae; soft dorsal and anal fins with 4 to 8 rays; and skin without conical bony plates.

**List of species occurring in the area**

- Chaenophryne draco* Beebe, 1932  
*Chaenophryne longiceps* Regan, 1925  
*Chirophryne xenolophus* Regan and Trewavas, 1932  
*Danaphryne nigrifilis* (Regan and Trewavas, 1932)  
*Dolopichthys longicornis* Parr, 1927  
*Dolopichthys pullatus* Regan and Trewavas, 1932  
*Leptacanthichthys gracilispinis* (Regan, 1925)  
*Lophodolos acanthognathus* Regan, 1925  
*Lophodolos indicus* Lloyd, 1909  
*Microlophichthys microlophus* Regan, 1925  
*Oneirodes alius* Seigel and Pietsch, 1978  
*Oneirodes carlsbergi* (Regan and Trewavas, 1932)  
*Oneirodes cristatus* (Regan and Trewavas, 1932)  
*Oneirodes eschrichtii* Lütken, 1871  
*Oneirodes flagellifer* (Regan and Trewavas, 1932)  
*Oneirodes melanocauda* Bertelsen, 1951  
*Oneirodes micronema* Grobecker, 1978  
*Oneirodes plagionema* Pietsch and Seigel, 1980  
*Oneirodes pterurus* Pietsch and Seigel, 1980  
*Oneirodes sabex* Pietsch and Seigel, 1980  
*Oneirodes schistonema* Pietsch and Seigel, 1980  
*Oneirodes schmidti* (Regan and Trewavas, 1932)  
*Oneirodes thysanema* Pietsch and Seigel, 1980  
*Pentherichthys* sp. (known only from larvae)  
*Tyrannophryne pugnax* Regan and Trewavas, 1932  
*Spiniphryne gladisfenae* (Beebe, 1932)

**References**

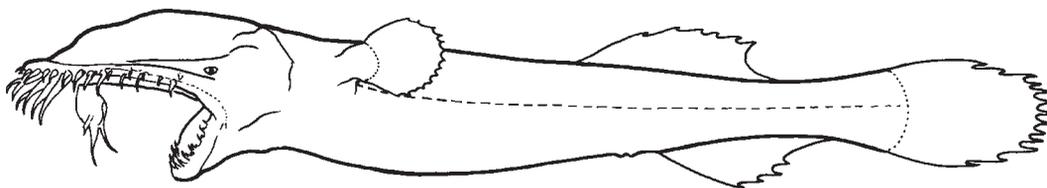
- Bertelsen, E. 1951. The ceratioid fishes. Ontogeny, taxonomy, distribution and biology. *Dana Rept.*, (39):276 p.  
 Pietsch, T.W. 1974. The Osteology and relationships of ceratioid anglerfishes of the family Oneirodidae with a review of the genus *Oneirodes* Lütken. *Bull. Los Angeles Co. Mus. Nat. Hist., Sci.*, 18:1-113.  
 Pietsch, T.W. and J.A. Seigel. 1980. Ceratioid anglerfishes of the Philippine Archipelago with descriptions of five new species. *U.S. Fish. Bull.*, 78(2):379-399.  
 Bertelsen, E. and T.W. Pietsch. 1983. Ceratioid anglerfishes of Australia. *Rec. Aust. Mus.*, 35(2):233-265.

## THAUMATICTHYIDAE

### Wonderfishes (deepsea anglerfishes)

by T.W. Pietsch

**Diagnostic characters:** Characterized by extreme sexual dimorphism in which males are dwarfed and reach only a fraction of the size of females. Soft dorsal fin with 5 to 7 rays; anal fin with 4 or 5 rays; **pelvic fins absent**. Females with body slender, elongate; head narrow (*Lasiognathus*) or conspicuously depressed and broad (*Thaumaticthys*); **upper jaw extending far forward of lower jaw**; first dorsal-fin spine (illicium) long, with terminal bioluminescent bait (esca), emerging from dorsal surface of head (*Lasiognathus*), or extremely short, embedded in skin of snout, bait hanging from roof of mouth (*Thaumaticthys*); **bait with 1 to 3 bony hook-like denticles**; skin naked (*Lasiognathus*), or spinulose on lower part of head and body (*Thaumaticthys*). **Males free-living, not becoming parasitic on females**; body elongate, slender; eyes large; olfactory organs very large; jaw teeth absent; snout with 4 separate denticles arranged in 2 pairs, 1 above the other; tip of lower jaw with 7 denticles, a lower transverse series of 4 and an upper transverse series of 3, all fused at base. **Colour:** dark red-brown to black over entire surface of head, body, fins (except for distal portion of bait), and oral cavity.



**Habitat, biology, and fisheries:** Solitary, bathypelagic (*Lasiognathus*) and benthic (*Thaumaticthys*) anglerfishes. Females passively attracting prey by means of a first dorsal-fin spine modified to serve as a luring device; males actively seeking mates by means of highly developed sense organs, apparently attaching themselves to the females by means of specialized tooth-bearing denticles born on the tips of the jaws, but not becoming parasitic. Females attaining a length of 30 cm, males 3.2 cm. Adults collected in midwater trawls at depths of about 800 to 1 800 m (*Lasiognathus*) or in bottom trawls at depths of 1 100 to 3 200 m (*Thaumaticthys*). They are of no economic interest.

#### Similar families occurring in the area

Other meso- and bathypelagic anglerfish families: thaumaticthyids are easily distinguished by having a slender, elongate body; the upper jaw extending anteriorly far beyond the lower; and the bait (either situated at the tip of an elongate first dorsal-fin spine, emerging from the dorsal surface of the head, or hanging from the roof of the mouth) with 1 to 3 bony hook-like denticles.

#### List of species occurring in the area

*Lasiognathus* sp. (unidentifiable females)

*Thaumaticthys pagidostomus* Smith and Radcliffe, 1912

#### Reference

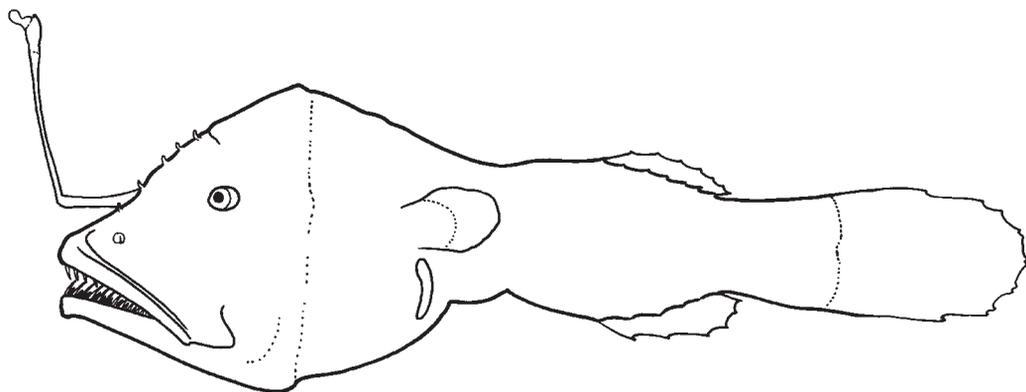
- Bertelsen, E., and P. J. Struhsaker. 1977. The ceratioid fishes of the genus *Thaumaticthys*: Osteology, relationships, distribution, and biology. *Galathea Rept.*, 14:7-40.
- Bertelsen, E., and T. W. Pietsch. 1996. A revision of the deep-sea anglerfish genus *Lasiognathus* (Lophiiformes: Thaumaticthyidae), with the description of a new species. *Copeia*, 1996(2):401-409.

## CENTROPHRYNIDAE

### Deepsea anglerfishes

by T.W. Pietsch

**Diagnostic characters:** Characterized by extreme sexual dimorphism in which males are dwarfed and reach only a fraction of the size of females. Soft dorsal fin with 6 or 7 rays; anal fin with 5 or 6 rays; **pelvic fins absent. Females with body elongate, compressed; first dorsal-fin spine (illicium) shorter than standard length, bearing a conspicuous terminal bioluminescent bait (esca);** jaws equal anteriorly; sphenotic spines absent; **no caruncles on back;** skin rough, everywhere covered with small, close-set spinules. **Males free-living, not becoming parasitic on females;** eyes small; olfactory organs large, directed laterally; 3 upper and 4 lower denticular teeth, fused at base; skin naked. **Males and juvenile females with a simple papilliform hyoid barbel.** **Colour:** dark red-brown to black over entire surface of head, body, fins (except for distal portion of bait), and oral cavity.



**Habitat, biology, and fisheries:** Solitary, meso- and bathypelagic anglerfishes. Females passively attracting prey by means of a first dorsal-fin spine modified to serve as a luring device; males actively seeking mates by means of highly developed sense organs, apparently attaching themselves to the females by means of specialized tooth-bearing denticles born on the tips of the jaws, but not becoming parasitic. Females attaining a length of 23 cm, males 1.3 cm. They are of no economic interest.

#### Similar families occurring in the area

Other meso- and bathypelagic anglerfish families: centrophrynids are distinguished by a combination of characters that includes an elongate, slender, laterally compressed body; jaws equal anteriorly; sphenotic spines absent; first dorsal-fin spine emerging from behind tip of snout; no caruncles on back; skin rough, everywhere covered with small, close-set spinules.

#### A single species occurring in the area

*Centrophryne spinulosa* Regan and Trewavas, 1932

#### Reference

Pietsch, T.W. 1972. A review of the monotypic deep-sea anglerfish family Centrophrynidae: Taxonomy, distribution, and osteology. *Copeia*, 1972:17-47.

## CERATIIDAE

### Seadevils (deepsea anglerfishes)

by T.W. Pietsch

**Diagnostic characters:** Characterized by extreme sexual dimorphism in which males are dwarfed and reach only a fraction of the size of females. Soft dorsal fin with 3 to 5 rays; anal fin with 4 rays; **pelvic fins absent**; caudal-fin rays 8 or 9. Females with body elongate, compressed; **first dorsal-fin spine (illicium) shorter than standard length, bearing a terminal bioluminescent bait (esca); 2 or 3 caruncles (modified dorsal-fin rays, each bearing a bioluminescent gland) on dorsal midline of trunk just anterior to origin of soft dorsal fin**; skin covered with numerous close-set dermal spines. **Adult males parasitic on females; eyes large, bowl-shaped, directed laterally**; a pair of large denticular teeth on snout, 2 pairs of denticular teeth on tip of lower jaw; skin naked and unpigmented in adolescent stages, spinulose and darkly pigmented in parasitic stages. **Colour:** dark red-brown to black over entire surface of head, body, fins (except for the distal portion of the bait), and oral cavity.



**Habitat, biology, and fisheries:** Solitary, meso- and bathypelagic anglerfishes. Females passively attracting prey by means of a first dorsal-fin spine modified to serve as a luring device; males actively seeking mates by means of highly developed sense organs, attaching themselves to the females by means of specialized tooth-bearing denticles born on the tips of the jaws and becoming parasitic through fusion of tissue and apparently blood vessels. Females attaining a length of 77 cm, males 1.6 cm. They are of no economic interest.

#### Similar families occurring in the area

Other meso- and bathypelagic anglerfish families: ceratiids are distinguished by having a combination of characters that includes an elongate, compressed body; 2 or 3 caruncles (modified dorsal-fin rays, each bearing a bioluminescent gland) on the dorsal midline of the trunk just anterior to the origin of the soft dorsal fin; and skin covered with numerous close-set dermal spines.

#### List of species occurring in the area

*Ceratias holboelli* Kröyer, 1845

*Ceratias uranoscopus* Murray, in Thomson, 1877

*Cryptopsaras couesi* Gill, 1883

#### Reference

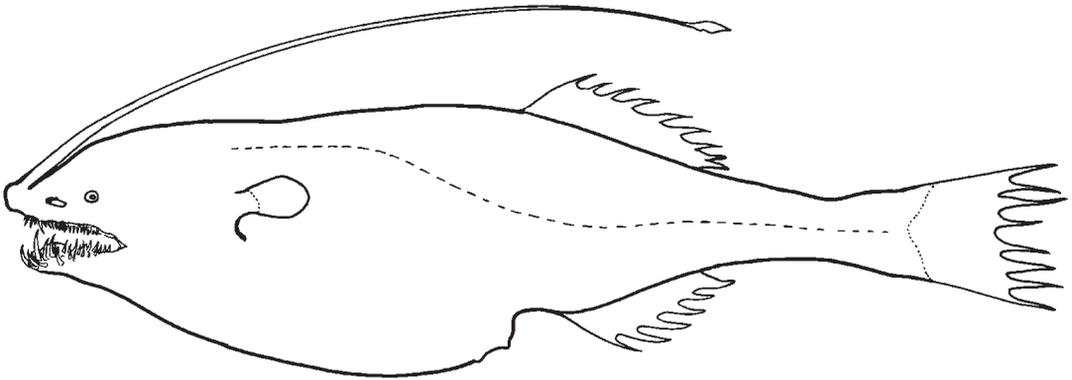
Pietsch, T.W. 1986. Systematics and distribution of bathypelagic anglerfishes of the family Ceratiidae (order: Lophiiformes). *Copeia*, 1986(2):479-493.

## GIGANTACTINIDAE

### Whipnose anglerfishes (deepsea anglerfishes)

by T.W. Pietsch

**Diagnostic characters:** Characterized by extreme sexual dimorphism in which males are dwarfed and reach only a fraction of the size of females. Soft dorsal fin with 4 to 10 rays; anal fin with 4 to 8 rays; pelvic fins absent. **Females with body slender, elongate, compressed**, head less than 35% length of head and body, **base of tail fin long, greater than 20% length of head and body; first dorsal-fin spine (illicium) greater than 1/2 length of head and body, emerging from extreme tip of snout, and bearing a conspicuous terminal bioluminescent bait (esca)**. Upper jaw extending slightly beyond lower jaw; sphenotic spines absent; **no caruncles on back**; skin rough, everywhere covered with small, close-set spinules. **Males free-living, not becoming parasitic on females**, with eyes minute, olfactory organs large, jaw teeth absent, denticular teeth all or nearly mutually free, not fused at base. **Colour:** dark red-brown to black over entire surface of head, body, fins (except for distal portion of bait), and oral cavity.



**Habitat, biology, and fisheries:** Solitary, meso- and bathypelagic anglerfishes. Females passively attracting prey by means of a first dorsal-fin spine modified to serve as a luring device; males actively seeking mates by means of highly developed sense organs, apparently attaching themselves to the females by means of specialized tooth-bearing denticles borne on the tips of the jaws, but not becoming parasitic. Females attaining a length of 40 cm, males 2.2 cm. They are of no economic interest.

#### Similar families occurring in the area

Other meso- and bathypelagic anglerfish families: gigantactinids are distinguished by having a combination of characters that includes an elongate, slender laterally compressed body; first dorsal-fin spine emerging from extreme tip of snout; upper jaw extending slightly beyond lower jaw; no caruncles on back; skin rough, everywhere covered with small, close-set spinules.

#### List of species occurring in the area

- Gigantactis longicirra* Waterman, 1939
- Gigantactis paxtoni* Bertelsen, Pietsch, and Lavenberg, 1981
- Gigantactis perlatus* Beebe and Crane, 1947
- Gigantactis vanhoeffeni* Brauer, 1902
- Rhynchactis leptonema* Regan, 1925

#### Reference

Bertelsen, E., T.W. Pietsch, and R.J. Lavenberg. 1981. Ceratioid anglerfishes of the family Gigantactinidae: Morphology, systematics and distribution. *Nat. Hist. Mus. Los Angeles Co., Contrib. Sci.*, 332:1-74.

## LINOPHRYNIDAE

### Netdevils (deepsea anglerfishes)

by T.W. Pietsch

**Diagnostic characters:** Characterized by extreme sexual dimorphism in which males are dwarfed and reach only a fraction of the size of females. **Soft dorsal fin with 3 rays (rarely 2 or 4); anal fin with 3 rays (rarely 2 or 4); pelvic fins absent.** Females with body short, globose; **first dorsal-fin spine (illicium) short, less than length of head and body in most specimens, bearing a conspicuous terminal bioluminescent bait (esca); an elongate hyoid barbel (absent in *Haplophryne*), bearing numerous, small, globular light organs;** sphenotic spines present; skin naked. **Adult males parasitic on females;** eyes large, slightly tubular, directed anteriorly; olfactory organs large; skin naked. **Colour:** dark brown to black over entire surface of head, body, fins (except for the distal portion of the bait) in *Linophryne*; skin unpigmented in *Haplophryne*.

#### **Habitat, biology, and fisheries:**

Solitary, meso- and bathypelagic anglerfishes. Females passively attracting prey by means of a first dorsal-fin spine modified to serve as a luring device; males actively seeking mates by means of highly developed sense organs, attaching themselves to the females by means of specialized tooth-bearing denticles born on the tips of the jaws and becoming parasitic through fusion of tissue and apparently blood vessels. Females attaining a length of 23 cm, males 2.9 cm. They are of no economic interest.

Females attaining a length of 23 cm, males 2.9 cm. They are of no economic interest.

#### **Similar families occurring in the area**

Other meso- and bathypelagic anglerfish families: linophrynids are distinguished by having a combination of characters that includes a short, globose body; short soft dorsal and anal fins, consisting of only 3 rays (rarely 2 or 4); an elongate hyoid barbel (absent in *Haplophryne*), bearing numerous, small, globular light organs; sphenotic spines present; and skin naked.

#### **List of species occurring in the area**

- Haplophryne mollis* (Brauer, 1902)
- Linophryne bipennata* Bertelsen, 1982
- Linophryne densiramus* Imai, 1941
- Linophryne indica* (Brauer, 1902)
- Linophryne trewavasae* Bertelsen, 1978

#### **References**

- Bertelsen, E. 1951. The ceratioid fishes. Ontogeny, taxonomy, distribution and biology. *Dana Rept.*, (39):276 p.
- Bertelsen, E. 1980. Notes on Linophryinidae V: A revision of the deep-sea anglerfishes of the *Linophryne arborifera*-group (Pisces, Ceratioidei). *Steenstrupia*, 6(6):29-70.
- Bertelsen, E. 1982. Notes on Linophryinidae VIII: A review of the genus *Linophryne*, with new records and descriptions of two new species. *Steenstrupia*, 8(3):49-104.

