

CERATIOID ANGLERFISHES OF THE PHILIPPINE ARCHIPELAGO, WITH DESCRIPTIONS OF FIVE NEW SPECIES¹

THEODORE W. PIETSCH² AND JEFFREY A. SEIGEL³

ABSTRACT

Ceratioid anglerfishes of the Philippine Archipelago, an area bounded by the islands of the Philippines to the north, Malaysia and Sumatra to the west, and New Guinea to the east, represent 10 of the 11 ceratioid families, 22 genera and 42 species, 5 species of which are newly described forms of the genus *Oneirodes* (Oneirodidae). The vast bulk of this material has recently been provided by midwater collections made by the *Alpha Helix* during the 1975 Southeast Asian Bioluminescence Expedition. All known records of ceratioids are listed with keys to families, genera, and species represented in the area. Revised and supplemental diagnostic and descriptive data as well as notes on geographic distribution are also provided.

Our knowledge of the ceratioid anglerfish fauna of the Philippine Archipelago, an area bounded by the islands of the Philippines to the north, Malaysia and Sumatra to the west, and New Guinea to the east, has recently been broadly expanded by midwater collections made by the RV *Alpha Helix* during the 1975 Southeast Asian Bioluminescence Expedition. This collecting effort was the first major ichthyological survey of this part of the world since the historic cruises of the United States Fisheries steamer *Albatross* in 1907-09, and the Danish RV *Dana* in 1929. The Ceratioidei are now represented by 10 of the 11 families, 22 genera, and 42 species, 5 species of which are newly described forms of the genus *Oneirodes* (Oneirodidae). All known records of ceratioids from this area are listed below with keys to families, genera, and species. Revised and supplemental diagnostic and descriptive data as well as notes on geographic distribution are also provided.

METHODS AND MATERIALS

Standard lengths (SL) are used throughout. Methods for taking counts and measurements, and terminology used in describing esca morphology follow Pietsch (1974a, fig. 60). Terminology used in describing the various parts of the

angling apparatus follows Bradbury (1967). Definitions of terms used for the different stages of development follow Bertelsen (1951). Locality data for *Alpha Helix* stations that yielded ceratioid material are listed in Appendix 1. *Alpha Helix* collections were made with a rectangular midwater trawl of 8 m² mouth area (RMT-8) that was equipped with an opening and closing device. This gear is more fully described elsewhere (Clarke 1969; Baker et al. 1973; Hopkins et al. 1973). All *Alpha Helix* material was deposited in the Natural History Museum of Los Angeles County (LACM). Material from other sources is catalogued in the following institutions: Australian Museum, Sydney (AMS), Scripps Institution of Oceanography, La Jolla (SIO), National Museum of Natural History, Washington, D.C. (USNM), and the Zoological Museum, University of Copenhagen (ZMUC). Specimens are females unless otherwise stated.

KEY TO FEMALES OF THE FAMILIES OF SOUTHEAST ASIAN CERATIOIDEI

- 1A. No distal bulb, illicium tipped with filaments; longest rays of dorsal and anal fin >60% of SL Caulophrynidae
- 1B. A bulbous light organ on tip of illicium; longest rays of dorsal and anal fin much <60% SL 2
- 2A. More than 11 dorsal fin rays Melanocetidae
- 2B. Less than 11 dorsal fin rays 3
- 3A. Two or three caruncles on back; cleft of mouth vertical to very oblique . Ceratiidae

¹Contribution No. 540 from the College of Fisheries, University of Washington, Seattle, WA 98195.

²College of Fisheries, University of Washington, Seattle, WA 98195.

³Section of Ichthyology, Natural History Museum of Los Angeles County, Los Angeles, CA 90007.

- 3B. No caruncles on back; cleft of mouth nearly horizontal 4
- 4A. A second cephalic ray present immediately posterior to base of illicium, bearing a distal luminous gland (withdrawn beneath skin in larger specimens, its presence indicated by a small pore) Diceratiidae
- 4B. No second cephalic ray 5
- 5A. Upper jaw extending anteriorly far beyond lower jaw; esca with 1-3 denticles Thaumatoichthyidae
- 5B. Jaws equal anteriorly; esca without denticles 6
- 6A. Illicium emerging on tip of snout; length of head <35% SL; length of caudal peduncle >20% SL; 5 pectoral radials Gigantactinidae
- 6B. Illicium emerging behind tip of snout; length of head >35% SL; length of caudal peduncle <20% SL; 3 or 4 pectoral radials 7
- 7A. Dermal spines or plates present 8
- 7B. Skin naked 10
- 8A. Skin with some large, bony plates, each bearing a median spine Himantolophidae
- 8B. Skin with numerous, close set spines .. 9
- 9A. Teeth present on ceratobranchials 1-4; 4 pectoral radials (but fusing to 3 in specimens greater than about 150 mm SL); larvae and adolescents up to about 50 mm SL with a short, digitiform, hyoid barbel Centrophrynidae
- 9B. Ceratobranchial teeth absent; 3 pectoral radials; no hyoid barbel Oneirodidae (*Spiniphryne*)
- 10A. Six branchiostegal rays; more than 4 dorsal fin rays; anal fin rays 4-7 Oneirodidae
- 10B. Four to five branchiostegal rays; 3 dorsal fin rays, rarely 2 or 4; anal fin rays 2-4 Linophrynidae

CAULOPHRYNIDAE

Key to Females of Genera and Species of Southeast Asian Caulophrynidae

- 1A. Illicium short, less than SL; dorsal fin rays 14-22; anal fin rays 12-19 *Caulophryne pelagica* (Brauer)
- 1B. Illicium long, 268% of SL in a 41 mm SL

specimen; dorsal fin rays 6, anal fin rays 5 *Robia legula* Pietsch (known from only the holotype, 41 mm SL)

Caulophryne Goode and Bean 1896

Caulophryne pelagica (Brauer 1902)

Material.—LACM 36023-1, 13 mm SL, stn 143.

A single individual, representing the sixth known specimen of *C. pelagica*, and the first record of this species from southeast Asian waters, was collected by the *Alpha Helix* in 1975. It was included in a recent revision of the family (Pietsch 1979).

Caulophryne sp. A

Material.—LACM 36025-1, female 98 mm SL with parasitic male 12 mm SL, stn 37.

This female and parasitically attached male, collected from the Banda Sea, cannot be placed within the material of any of the three recognized species of *Caulophryne* (Pietsch 1979). The attached male represents the second example of sexual parasitism in the family Caulophrynidae.

Caulophryne sp. B, Figure 1

Material.—LACM 36112-1, 10 mm SL, stn 183; LACM 36111-1, 10.5 mm SL, stn 184; LACM 36109-2, 11.5 mm SL, stn 193.

These three small females were sorted out of the *Alpha Helix* collections after a recent revision of the family went to press (Pietsch 1979). They differ significantly from the material of the three recognized species of *Caulophryne* in having an elongate, distally branched, lateral appendage on each side of the esca bulb; distal esca filaments, present in all the described species of the genus, are absent. Although these most likely represent a new form, the small size of the specimens and their poor condition do not warrant description at this time.

Robia Pietsch 1979

Robia legula Pietsch 1979

Material.—LACM 36024-1, 41 mm, stn 81 (holotype).

This species is known from a single specimen collected in the Banda Sea (Pietsch 1979).

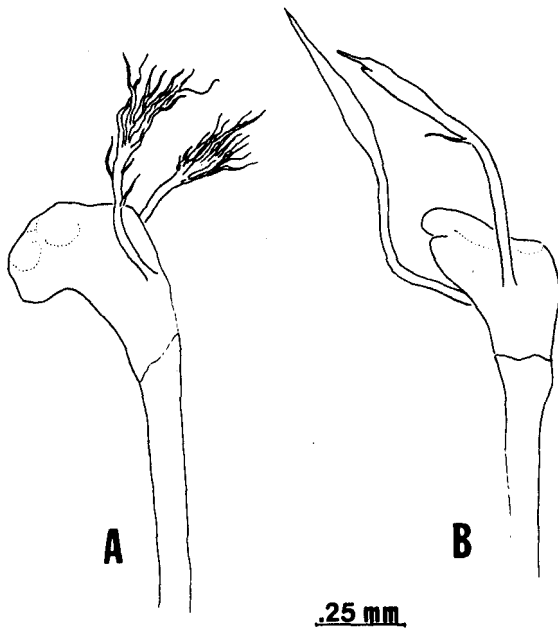


FIGURE 1.—Escae of *Caulophryne* sp. B, left lateral views: A. LACM 36112-1, 10 mm SL; B. LACM 36111-1, 10.5 mm SL.

and Van Duzer 1980). This species has a wide geographic distribution in tropical and subtropical waters of all three major oceans of the world.

Melanocetus murrayi Günther 1887

Material.—LACM 36114-1, 68 mm SL, stn 66; LACM 36113-1, 82 mm SL, stn 71; LACM 36115-1, 84 mm SL, stn 102.

Melanocetus murrayi is represented by three females in the *Alpha Helix* collections (Pietsch and Van Duzer 1980). This species has a wide horizontal distribution in the Atlantic and Pacific Oceans, but is apparently absent from the Indian Ocean.

Melanocetus sp.

Material.—Males: LACM 36067-2, 13.5 mm SL, stn 23; LACM 36116-1, 21.5 mm SL, stn 84; LACM 36032-4, 22.5 mm SL, stn 110.

These male specimens could not be satisfactorily identified to species (Pietsch and Van Duzer 1980).

MELANOCETIDAE

Melanocetus Günther 1864

Key to Females of Species of Southeast Asian *Melanocetus*

- 1A. Anterior margin of vomer nearly straight; width of pectoral fin lobe 10.7-17.8% SL; number of lower jaw teeth 32-78 *M. johnsoni* Günther
- 1B. Anterior margin of vomer deeply concave; width of pectoral fin lobe 6.1-8.9% SL; number of lower jaw teeth 46-142 *M. murrayi* Günther

Melanocetus johnsoni Günther 1864

Material.—LACM 36076-3, 14 mm SL, stn 26; LACM 36059-3, 15 mm SL, stn 103; LACM 36032-3, 15 mm SL, stn 110; LACM 36076-5, 17 mm SL, stn 26; LACM 36074-2, 18 mm SL, stn 120; LACM 36033-2, 36 mm SL, stn 88.

Six specimens of *M. johnsoni* were collected by the *Alpha Helix* in 1975, all of which were included in a recent revision of the Melanocetidae (Pietsch

HIMANTOLOPHIDAE

Himantolophus Reinhardt 1837

Himantolophus sp.

Material.—Female: LACM 36038-3, 2(12.5-14 mm SL), stn 87. Males: LACM 36091-4, 16 mm SL, stn 142; LACM 36057-4, 19 mm SL, stn 93; LACM 36075-4, 4(19.5-21 mm SL), stn 121; LACM 36074-3, 21 mm SL, stn 120; LACM 36040-3, 27.5 mm SL, stn 27; LACM 36046-8, 2(29.5-33 mm SL), stn 97; LACM 36124-1, 31 mm SL, stn 112.

Thirteen specimens of *Himantolophus* were collected by the *Alpha Helix* from the Banda, Ceram, and Halmahera Seas. The genus is cosmopolitan in all three major oceans of the world (Bertelsen 1951), yet no adult females have been collected in the immediate area. These males and larval females could not be identified specifically.

DICERATIIDAE

Key to Genera and Species of Southeast Asian Diceratiidae

- 1A. Illicium <50% SL; distance between insertion of illicium and symphysial car-

- tilage of upper jaw <15% SL
 *Diceratias bispinosus* (Günther)
 1B. Illicium >80% SL; distance between in-
 sertion of illicium and symphyial carti-
 lage of upper jaw >30% SL
 *Phrynichthys thele* Uwate

Diceratias Günther 1887

Diceratias bispinosus (Günther 1887)

Material.—LACM 36075-1, 20 mm SL, stn 121.

A single specimen of *Diceratias bispinosus* was collected by the *Alpha Helix* in the Halmahera Sea. This species is known only from the Indo-West Pacific (Uwate 1979).

Phrynichthys Pietschmann 1926

Phrynichthys thele Uwate 1979

Material.—LACM 36077-1, 32 mm SL, stn 155 (holotype); LACM 36076-1, 22 mm, stn 26 (paratype).

This species is known only from two specimens collected from the Ceram and Halmahera Seas, and described in a recent revision of the Diceratiidae (Uwate 1979).

ONEIRODIDAE

Key to Females of Genera of Southeast Asian Oneirodidae

- 1A. Skin covered with numerous, close set spines *Spiniphryne* Bertelsen
 1B. Skin naked 2
 2A. Sphenotic spines present; opercle deeply notched posteriorly 3
 2B. Sphenotic spines absent; opercle only slightly concave posteriorly
 *Chaenophryne* Regan
 3A. Pectoral fin lobe short and broad, shorter than longest pectoral fin rays 4
 3B. Pectoral fin lobe long and narrow, longer than longest pectoral fin rays
 *Chirophryne* Regan and Trewavas
 4A. Lower jaw with a symphyial spine, ventral margin of dentaries at symphysis convex; caudal fin rays not internally pigmented 5
 4B. Lower jaw without symphyial spine, ventral margin of dentaries at symphy-

- sis concave; caudal fin rays internally pigmented
 *Pentherichthys* Regan and Trewavas
 5A. Illicial apparatus emerging from between frontal bones 6
 5B. Illicial apparatus not emerging from between frontal bones but between sphenotic spines or further posterior ..
 *Lophodolos* Lloyd
 6A. Dorsal margin of frontal bones strongly curved; subopercle short and broad, lower part nearly circular 7
 6B. Dorsal margin of frontal bones nearly straight; subopercle long and narrow, lower part strongly oval
 *Dolopichthys* Garman
 7A. Caudal fin rays covered with black skin for some distance beyond fin base; anal fin rays 5, rarely 4 8
 7B. Caudal fin rays not covered by black skin except at base; anal fin rays 4, rarely 5 *Oneirodes* Lütken
 8A. Cleft of mouth extending past eye; length of escal bulb more than half length of illicial bone; upper part of subopercle broad and rounded
 ... *Microlophichthys* Regan and Trewavas
 8B. Cleft of mouth not extending past eye; escal bulb considerably shorter than half length of illicial bone; upper part of subopercle slender and tapering to a point *Danaphyrne* Bertelsen

Spiniphryne Bertelsen 1951

Spiniphryne gladisfenae (Beebe 1932)

Material.—LACM 36073-2, 18 mm SL, stn 94.

Spiniphryne gladisfenae was previously known only from the Atlantic Ocean (Bertelsen and Pietsch 1975): three specimens collected from the eastern tropical Atlantic, and the holotype from off Bermuda. A fifth specimen, collected in the Banda Sea by the *Alpha Helix*, is the first record from the Pacific.

Oneirodes Lütken 1871

Key to Females of Species of Southeast Asian *Oneirodes*

Oneirodes melanocauda, known only from five larval specimens is omitted from the following key.

- 1A. Epibranchial of first arch toothed
..... *O. carlsbergi* (Regan and Trewavas)
- 1B. Epibranchial teeth absent 2
- 2A. Anterior escal appendage without internal pigment; usually two pairs of filamentous anterolateral escal appendages (*O. schmidti* group) .. 3
- 2B. Anterior escal appendage internally pigmented; anterolateral escal appendages, if present, one or four filamentous pairs 5
- 3A. Length of all escal appendages less than length of escal bulb
..... *O. micronema* Grobecker
- 3B. Length of some escal appendages much greater than length of escal bulb 4
- 4A. Anterior escal appendage unbranched, anterolateral escal appendages absent ..
..... *O. alius* Seigel and Pietsch
- 4B. Anterior escal appendage highly branched, anterolateral escal appendages present .. *O. schmidti* (Regan and Trewavas)
- 5A. Medial escal appendages present 6
- 5B. Medial escal appendages absent 10
- 6A. Posterior escal appendage cylindrical in cross section 7
- 6B. Posterior escal appendage compressed .. 8
- 7A. Anterior escal appendage cylindrical in cross section; posterior escal appendage as long as or longer than length of escal bulb *O. eschrichtii* Lütken
- 7B. Anterior escal appendage laterally compressed; posterior escal appendage less than half length of escal bulb
..... *O. sabex* n.sp.
- 8A. Medial escal appendages short and closely set in a tight cluster 9
- 8B. Medial escal appendages elongate and widely placed *O. thysanema* n.sp.
- 9A. Anterior escal appendage elongate and cylindrical in cross section, with a few short, distal branches; pectoral fin rays 17 *O. pterurus* n.sp.
- 9B. Anterior escal appendage short and laterally compressed, with a membranous scalloped distal margin; pectoral fin rays 13 or 14
..... *O. cristatus* (Regan and Trewavas)
- 10A. Anterior escal appendage directed dorsally; posterior escal appendage as long as or longer than length of escal bulb ... 11
- 10B. Anterior escal appendage directed anteroventrally; posterior escal appendage

- much shorter than length of escal bulb
..... *O. pligionema* n.sp.
- 11A. Posterior escal appendage unbranched, length two to four times length of escal bulb .. *O. flagellifer* (Regan and Trewavas)
- 11B. Posterior escal appendage branched, approximately as long as length of escal bulb *O. schistonema* n.sp.

Oneirodes carlsbergi (Regan and Trewavas 1932)

Material.—LACM 36068-2, 19 mm, stn 25.

Oneirodes carlsbergi is known from the western tropical Atlantic and Pacific Oceans, and from a single record in the Indo-West Pacific region at about lat. 17° N, long. 120° E (Pietsch 1974a, fig. 107). An additional specimen, collected by the *Alpha Helix* from the Banda Sea, is the second known record from this part of the world.

Oneirodes cristatus (Regan and Trewavas 1932), Figure 2

Oneirodes cristatus is known only from the type material (3 females, 20-165 mm SL) collected by the *Dana* in the Banda and Celebes Seas (Pietsch 1974a).

Oneirodes eschrichtii Lütken 1871, Figure 3

Material.—LACM 36049-1, 10.5 mm SL, stn 194; LACM 36122-2, 12 mm SL, stn 179; LACM 36121-2, 21 mm SL, stn 178.

Oneirodes eschrichtii has a nearly cosmopolitan

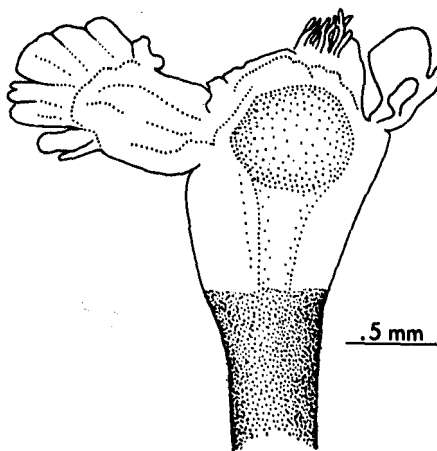


FIGURE 2.—Esca of *Oneirodes cristatus*, lectotype, ZMUC P9286, 165 mm SL, left lateral view.

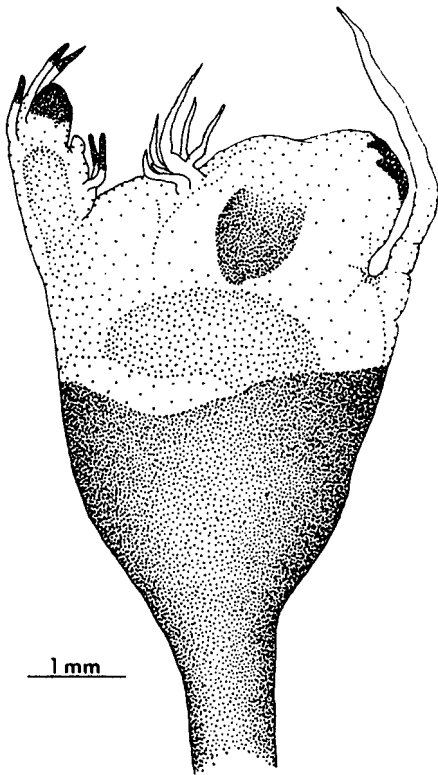


FIGURE 3.—Esca of *Oneirodes eschrichtii*, holotype, ZMUC P64, 153 mm SL, left lateral view.

distribution (Pietsch 1974a, fig. 109). Three specimens of this species were collected by the *Alpha Helix* in southeast Asian waters.

Oneirodes flagellifer (Regan and Trewavas 1932), Figure 4, Table 1

Material.—LACM 36118-1, 2(10.5-13.5 mm SL), stn 180; LACM 36117-1, 11.5 mm SL, stn 173;

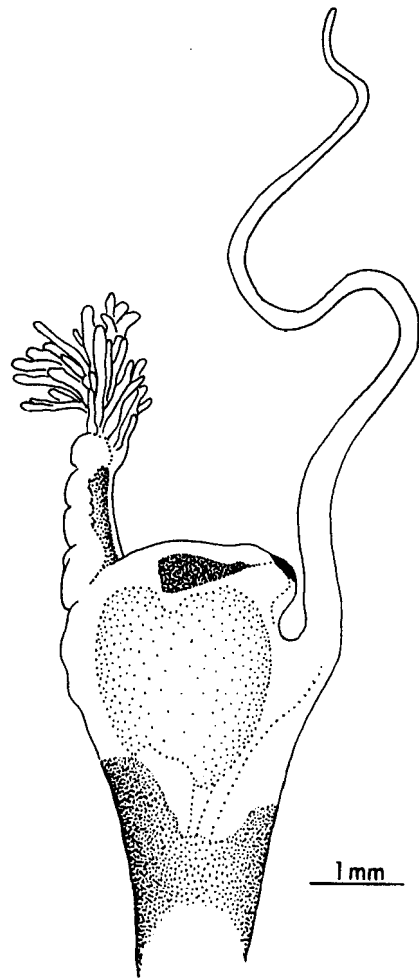


FIGURE 4.—Esca of *Oneirodes flagellifer*, holotype, ZMUC P9280, 22 mm SL, left lateral view.

LACM 36100-2, 12 mm SL, stn 166; LACM 36112-2, 14 mm SL, stn 183; LACM 36109-3, 15.5 mm SL, stn 193.

TABLE 1.—Measurements and counts of specimens of *Oneirodes flagellifer*. Measurements expressed as percentage of standard length.

Item	LACM 36118-1	LACM 36117-1	LACM 36100-2	LACM 36118-1	LACM 36112-2	LACM 36109-3
Standard length (mm)	10.5	11.5	12	13.5	14	15.5
Length:						
Head	—	43.5	41.7	46.1	46.4	45.2
Lower jaw	—	47.8	45.8	46.1	50.0	48.4
Premaxilla	—	34.8	33.3	37.0	35.7	32.3
Illicium	23.8	21.7	—	22.2	25.0	19.3
Head depth	—	43.5	41.7	37.0	46.4	45.2
Teeth:						
Vomer	4	6	6	6	6	7
Upper jaw	16	19	17	28	42	42
Lower jaw	22	30	28	36	45	48
Dorsal fin rays	—	6	5	5	5	5
Anal fin rays	4	4	4	—	4	4
Pectoral fin rays	—	—	15	15	15	14

Oneirodes flagellifer was previously known from only three specimens, all collected from the Indo-West Pacific region: the holotypes of *O. flagellifer* and *O. thysanophorus* (= *O. flagellifer*) collected by the *Dana* in 1929, and an additional specimen collected by the *Galathea* in 1951 (Pietsch 1974a, fig. 110). The *Alpha Helix* has added six additional females from the Sulu Sea that compare very well with the previously recorded material (Table 1).

Oneirodes melanocauda Bertelsen 1951

Oneirodes melanocauda is known from five larval specimens (easily separated from other *Oneirodes* larvae by the presence of pigment on the tips of the caudal fin rays, Pietsch 1974a) three of which were collected by the *Dana* in southeast Asian waters. No additional material was provided by the Southeast Asian Bioluminescence Expedition.

Oneirodes plagionema n.sp., Figures 5, 6; Table 2

Material.—A single female, the holotype, LACM 36114-2, 25 mm SL, stn 66.

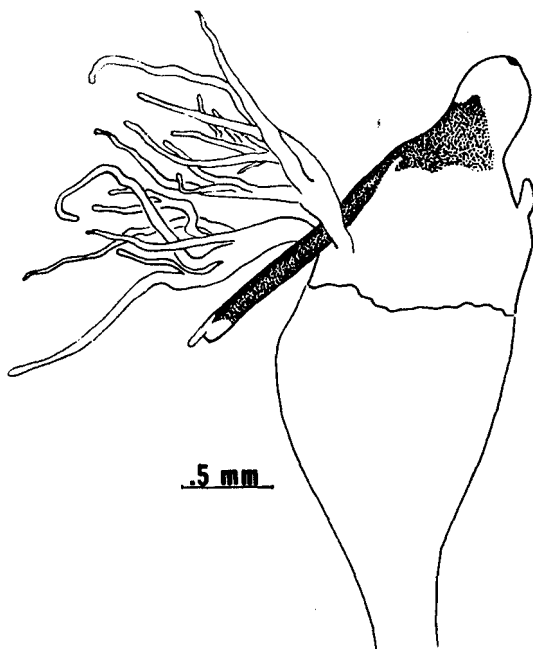


FIGURE 5.—Esca of *Oneirodes plagionema* n.sp., holotype, LACM 36114-2, 25 mm SL, left lateral view.

Diagnosis.—A species of *Oneirodes* differing from all previously described species in esca morphology: anterior appendage narrow, elongate, and directed anteroventrally; medial appendages absent; posterior appendage minute; a pair of filamentous, branched, anterolateral appendages.

Description.—Esca appendage pattern B (Pietsch 1974a, fig. 60B); esca with anterior appendage narrow and elongate, with a single, short, distal filament, directed anteroventrally; medial appendages absent; terminal papilla unusually large, rounded, with a distal pigment spot; posterior appendage minute; a filamentous, branched, anterolateral appendage on each side (Figure 5).

Suboperculum short, upper end rounded without indentation on posterior margin (Figure 6); length of lower fork of operculum 24.0% of SL; ratio of lengths of upper and lower forks of operculum 0.53.

Epibranchial teeth absent; teeth present on pharyngobranchial II.

Counts and measurements in Table 2.

Etymology.—The name *plagionema* is derived from the Greek *plagios*, meaning oblique, and *nema*, thread, alluding to the oblique, anteroventrally directed anterior esca appendage.

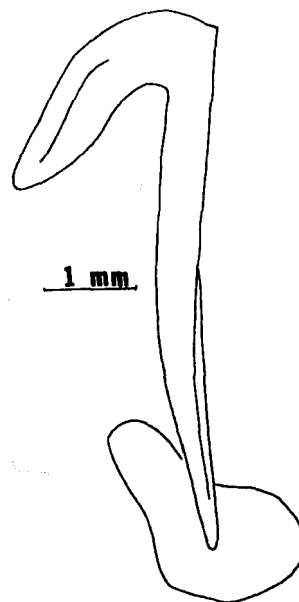


FIGURE 6.—Opercular bones of *Oneirodes plagionema* n.sp., holotype, LACM 36114-2, 25 mm SL, right lateral view.

TABLE 2.—Measurements and counts of four new species of *Oneirodes*. Measurements expressed as percentage of standard length.

Item	<i>O. plagionema</i>	<i>O. pterurus</i>	<i>O. schistonema</i>	<i>O. thysanema</i>	<i>O. thysanema</i>
	Holotype LACM 36114-2	Holotype LACM 36075-3	Holotype LACM 36036-3	Paratype LACM 36073-4	Holotype USNM 207931
Standard length (mm)	24	30	74	13	26.5
Length:					
Head	45.8	46.7	37.2	38.5	45.3
Lower jaw	45.8	50.0	41.2	42.3	47.2
Premaxilla	31.2	35.0	26.3	26.9	30.2
Illicium	25.0	26.7	28.4	15.4	26.4
Head depth	37.5	46.7	28.4	34.6	43.4
Teeth:					
Vomer	5	6	6	4	6
Upper jaw	24	30	42	8	32
Lower jaw	35	39	40	10	30
Dorsal fin rays	5	6	6	5	6
Anal fin rays	4	4	4	4	4
Pectoral fin rays	15	17	14	17	17

Oneirodes pterurus n.sp., Figures 7, 8; Table 2

Material.—A single female, the holotype, LACM 36075-3, 30 mm SL, stn 121.

Diagnosis.—A species of *Oneirodes* differing from all previously described species in esca morphology: anterior appendage with a few distal branches; medial appendage represented by a tuft

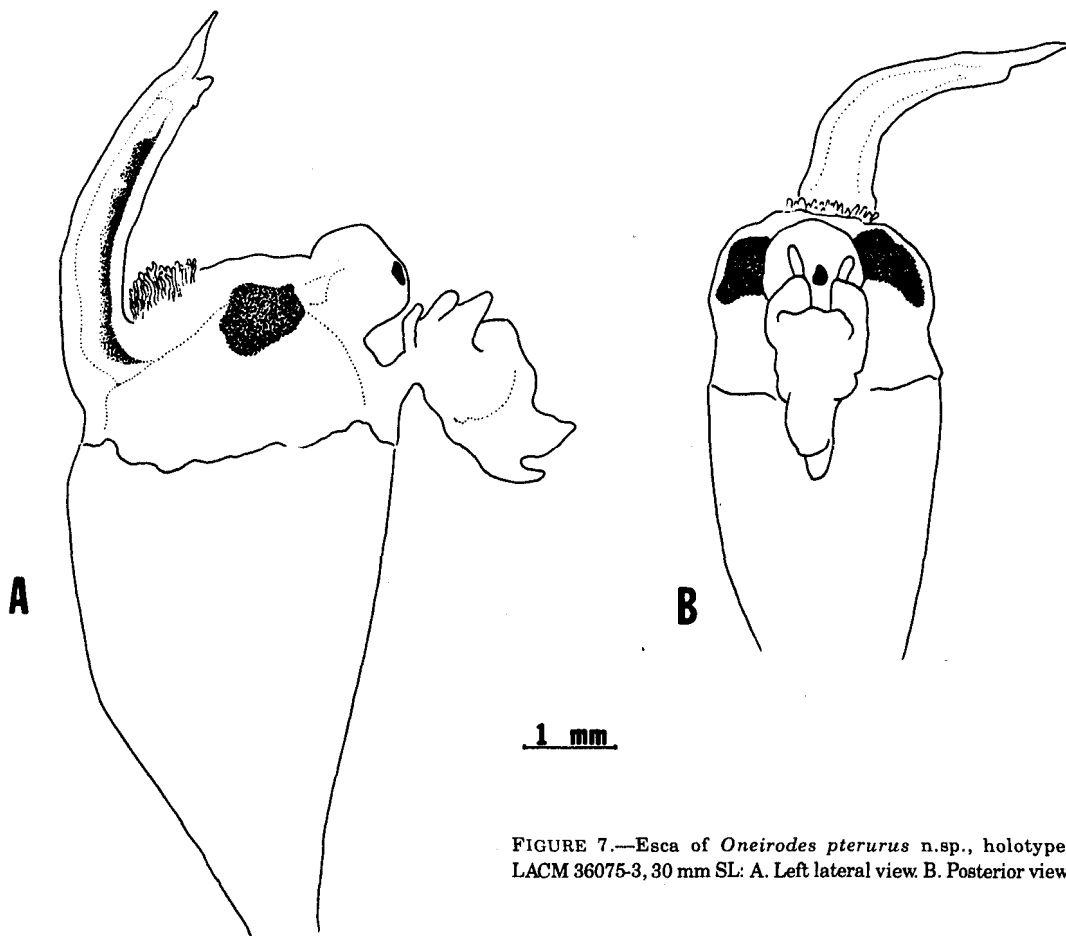


FIGURE 7.—Esca of *Oneirodes pterurus* n.sp., holotype, LACM 36075-3, 30 mm SL: A. Left lateral view. B. Posterior view.

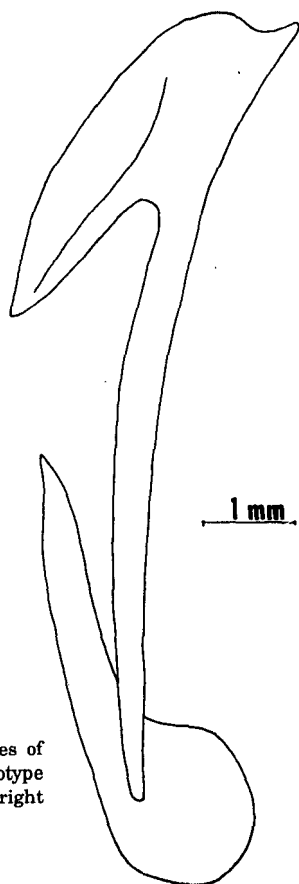


FIGURE 8.—Opercular bones of *Oneirodes pterurus* n.sp., holotype LACM 36075-3, 30 mm SL, right lateral view.

of short filaments; posterior appendage non-filamentous.

Description.—Escal appendage pattern B (Pietsch 1974a, fig. 60B); esca with anterior appendage approximately as long as escal bulb, bearing three, short branches at distal tip; distal end of internal, pigmented tube of anterior appendage with a circular, translucent “eye-spot”; medial appendage represented by a tuft of extremely short filaments; terminal papilla bulbous, with a distal pigment spot; posterior appendage nonfilamentous, consisting of a large, compressed wedge of tissue on a short, narrow base, bearing two or three, short filaments on each side of anterior surface, and two winglike projections, one above the other, on posterior margin; anterolateral appendages absent (Figure 7).

Suboperculum unusually long and narrow, upper end tapering to a point without indentation on posterior margin (Figure 8); length of lower

fork of operculum 27.3% of SL; ratio of lengths of upper and lower forks of operculum 0.56.

Epibranchial teeth absent; teeth present on pharyngobranchial II.

Counts and measurements in Table 2.

Etymology.—The name *pterurus* is derived from the Greek *pteron*, meaning wing, and *ura*, tail, alluding to the winglike posterior escal appendage of this species.

Oneirodes sabex n.sp., Figures 9, 10; Table 3

Oneirodes eschrichtii Pietsch 1974a:100, 103, fig. 116B (misidentification).

Material.—Fourteen metamorphosed females, 12–121 mm. Holotype: LACM 36116-3, 46 mm SL, stn 84. Paratypes: LACM 36087-4, 3 (12–26.5 mm SL), stn 135; LACM 36068-3, 12 mm SL, stn 25; LACM 36028-5, 13 mm SL, stn 141; LACM 36023-3, 13 mm SL, stn 143; LACM 36089-4, 2 (15–17 mm SL), stn 137; LACM 36051-3, 15 mm SL, stn 38; LACM 36088-4, 15.5 mm SL, stn 136; AMS I.20315-010, 32.5 mm SL, *Kapala*, lat. 33°53' S, long. 152°02' E, Engel Midwater Trawl, 0–900 m, bottom depth 1,800 m, 1330–1990 h, 14 December 1977; AMS I.20314-016, 39 mm SL, *Kapala*, lat. 33°28' S, long. 152°33' E, Engel Midwater Trawl, 0–900 m, bottom depth 4,200 m, 0530–1045 h, 14 December 1977; SIO 70-339, 121 mm SL, lat. 19°35' N, long. 122°57' E, 3 m IKMT (Isaacs-Kidd Midwater Trawl), 0–1,450 m, 1845–0225 h, 15–16 September 1970.

Diagnosis.—A species of *Oneirodes* differing from all previously described species in escal morphology: anterior appendage noncylindrical, compressed, without pigmented, internal tube; medial appendage present; posterior appendage cylindrical, unbranched.

Description.—Escal appendage pattern B (Pietsch 1974a, fig. 60B); esca with anterior appendage noncylindrical, strongly compressed and rounded, darkly pigmented along distal margin in some specimens; a pair of filamentous medial appendages; terminal papilla usually with two distal pigment spots situated on midline, one just behind the other; posterior appendage short, stout, and cylindrical; anterolateral appendages absent (Figure 9; Pietsch 1974a, fig. 116B).

Suboperculum short, upper end tapering to a

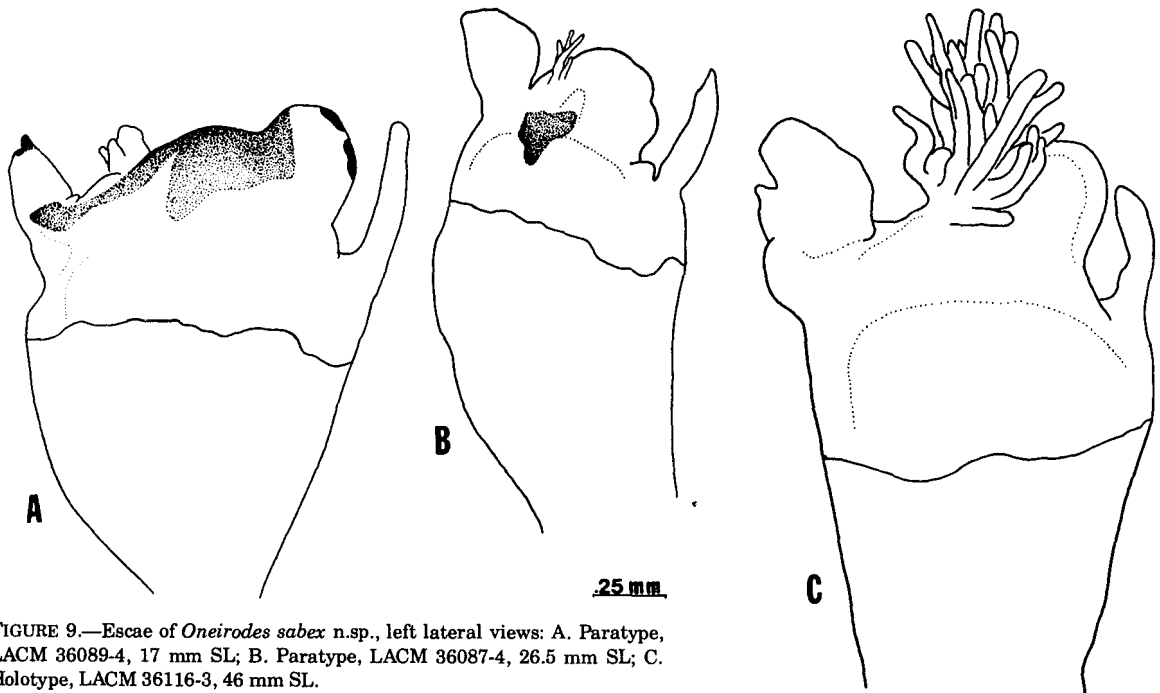
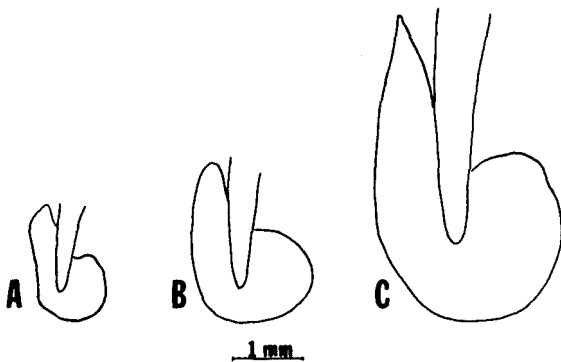


FIGURE 9.—Escae of *Oneirodes sabex* n.sp., left lateral views: A. Paratype, LACM 36089-4, 17 mm SL; B. Paratype, LACM 36087-4, 26.5 mm SL; C. Holotype, LACM 36116-3, 46 mm SL.



point without indentation on posterior margin (Figure 10); length of lower fork of operculum 27.1% of SL; ratio of lengths of upper and lower forks of operculum 0.48.

Epibranchial teeth absent; teeth present on pharyngobranchial II.

Counts and measurements in Table 3.

FIGURE 10.—Subopercula of *Oneirodes sabex* n.sp., right lateral views: A. Paratype, LACM 36089-4, 17 mm SL; B. Paratype, AMS I.20315-010, 32 mm SL; C. Holotype, LACM 36116-3, 46 mm SL.

TABLE 3.—Measurements and counts of specimens of *Oneirodes sabex* n.sp. Measurements expressed as percentage of standard length.

Item	LACM 36088-3	LACM 36028-5	LACM 36087-4	LACM 36089-4	LACM 36051-3	LACM 36088-4	LACM 36089-4	Paratype LACM 36087-4	Holotype LACM 36116-3	Paratype SiO 70-339
Standard length (mm)	12	13	13	15	15	15.5	17	26.5	45.5	121
Length:										
Head	41.7	46.1	38.5	43.3	40.0	41.9	35.3	39.5	37.4	35.1
Lower jaw	45.8	42.3	42.3	46.7	43.3	48.4	35.3	45.3	41.8	36.7
Premaxilla	29.2	30.8	30.8	33.3	30.0	32.3	23.5	32.1	27.5	26.0
Illicium	20.8	19.2	19.2	26.7	23.3	29.0	17.6	26.5	18.7	14.4
Head Depth	41.7	38.5	38.5	43.3	40.0	45.2	35.3	41.5	38.5	34.2
Teeth:										
Vomer	4	4	4	8	4	6	4	6	6	6
Upper jaw	5	15	—	22	23	34	25	30	26	42
Lower jaw	5	26	21	30	30	34	25	37	41	50
Dorsal fin rays	6	5	6	6	6	6	6	5	6	6
Anal fin rays	4	4	4	4	4	4	4	4	4	4
Pectoral fin rays	—	16	16	15	15	16	17	15	14	16

Distribution.—*Oneirodes sabex* is known only from southeast Asian and eastern Australian waters: the *Alpha Helix* material, including the holotype and 10 paratypes, was collected in the Banda Sea; the 121 mm SL paratype (SIO 70-339) is from off Luzon, Philippines; the 32.5 and 39 mm SL paratypes (AMS I. 20315-010, AMS I.20314-016) were collected off Sydney, Australia.

Etymology.—The name *sabex* is an acronym formed from the initial letters of the name "South-east Asian Bioluminescence Expedition" in recognition of the important ichthyological contribution made by those involved.

Oneirodes schistonema n.sp., Figures 11, 12; Table 2

Material.—A single female, the holotype, LACM 36036-3, 74 mm, stn 24.

Diagnosis.—A species of *Oneirodes* differing from all previously described species in escal morphol-

ogy: anterior appendage branched, unpigmented internally; medial and anterolateral appendages absent; posterior appendage branched.

Description.—Escal appendage pattern B (Pietsch 1974a, fig. 60B); esca with a stout, unpigmented, anterior appendage, less than length of escal bulb, bearing four, short, distal branches; pigmented internal tube of anterior appendage absent; medial and anterolateral appendages absent; terminal papilla without distal pigment spot; posterior appendage as large as anterior appendage, bearing four short branches near distal end (Figure 11).

Upper end of suboperculum long, narrow, and tapering, left suboperculum deeply indented (Figure 12); length of lower fork of operculum 25.3% of SL; ratio of lengths of upper and lower forks of operculum 0.48.

Epibranchial teeth absent; teeth present on pharyngobranchial II.

Counts and measurements in Table 2.

Etymology.—The name *schistonema* is derived from the Greek *schistos*, meaning divided, and *nema*, thread, alluding to the divided anterior and posterior escal appendages of this species.

Oneirodes thysanema n.sp., Figures 13, 14; Table 2

Material.—Two females, 13 and 26.5 mm SL. Holotype: USNM 207931, 26.5 mm SL; Ocean Acre cruise 7, stn 13N, Bermuda, lat. 32°18' N, long. 63°30' W, 3 m IKMT, 0-1,500 m, 1430-1730 h, 8

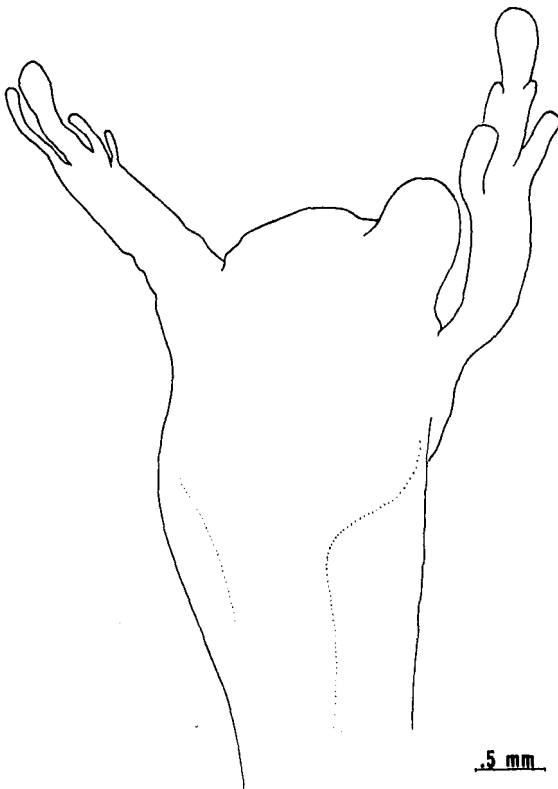


FIGURE 11.—Esca of *Oneirodes schistonema* n.sp., holotype, LACM 36036-3, 74 mm SL, left lateral view.

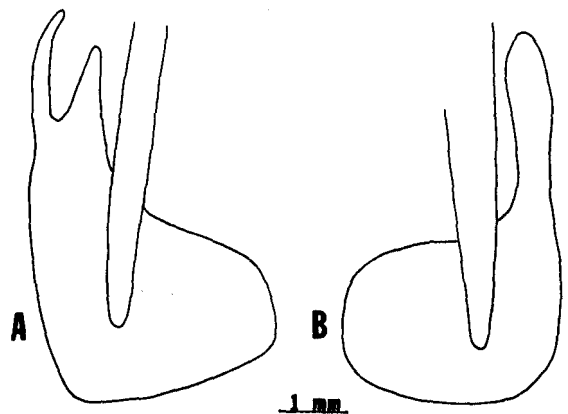


FIGURE 12.—Subopercle of *Oneirodes schistonema* n.sp., holotype, LACM 36036-3, 74 mm SL: A. Right lateral view; B. Left lateral view.



FIGURE 13.—Esca of *Oneirodes thysanema* n.sp., USNM 207931, holotype, 26.5 mm SL, left lateral view.

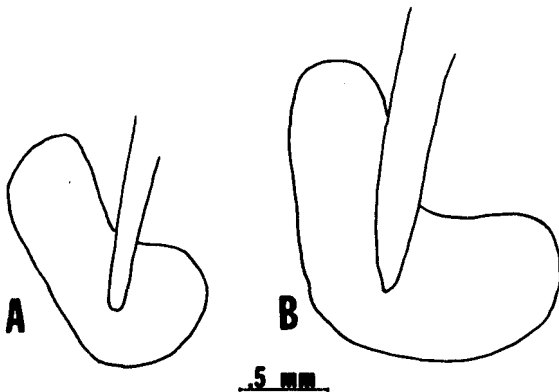


FIGURE 14.—Subopercula of *Oneirodes thysanema* n.sp., right lateral views: A. Paratype, LACM 36093-4, 13 mm SL; B. Holotype, USNM 207931, 26.5 mm SL.

September 1969. Paratype: LACM 36073-4, 13 mm SL, stn 94.

Diagnosis.—A species of *Oneirodes* differing from all previously described species in escal morphology: anterior appendage with a series of filaments along posterior margin; medial appendages in three groups; terminal papilla elongate; posterior appendage compressed and branched.

Description.—Escal appendage pattern B (Pietsch 1974a, fig. 60B); esca with a stout, internally pigmented, anterior appendage, greater than length of esca bulb, bearing along posterior margin a single branched filament proximally, and a series of unbranched filaments distally; medial appendages in three groups, a highly filamentous pair lying between a similar, but unpaired appendage, and a series of three, stout papillae situated at the base of the terminal papilla; terminal papilla unusually long, directed posterodorsally; posterior appendage as long as anterior appendage, highly compressed, bearing one or two, short, lateral filaments, and a considerably longer, branched, filamentous, anterolateral appendage on each side; distal tip of internal tube of anterior appendage, and dorsal pigment patch of esca bulb with a paired circular, translucent “eye spot” (Figure 13).

Suboperculum short and broad, upper end rounded without indentation on posterior margin (Figure 14); length of lower fork of operculum 27.7-30.2% of SL; ratio of lengths of upper and lower forks of operculum 0.48-0.50.

Epibranchial teeth absent; teeth present on pharyngobranchial II.

Counts and measurements in Table 2.

Etymology.—The name *thysanema* is derived from the Greek *thysanos*, meaning a fringe, and *nema*, thread, alluding to the numerous filaments fringing the anterior esca appendage of this species.

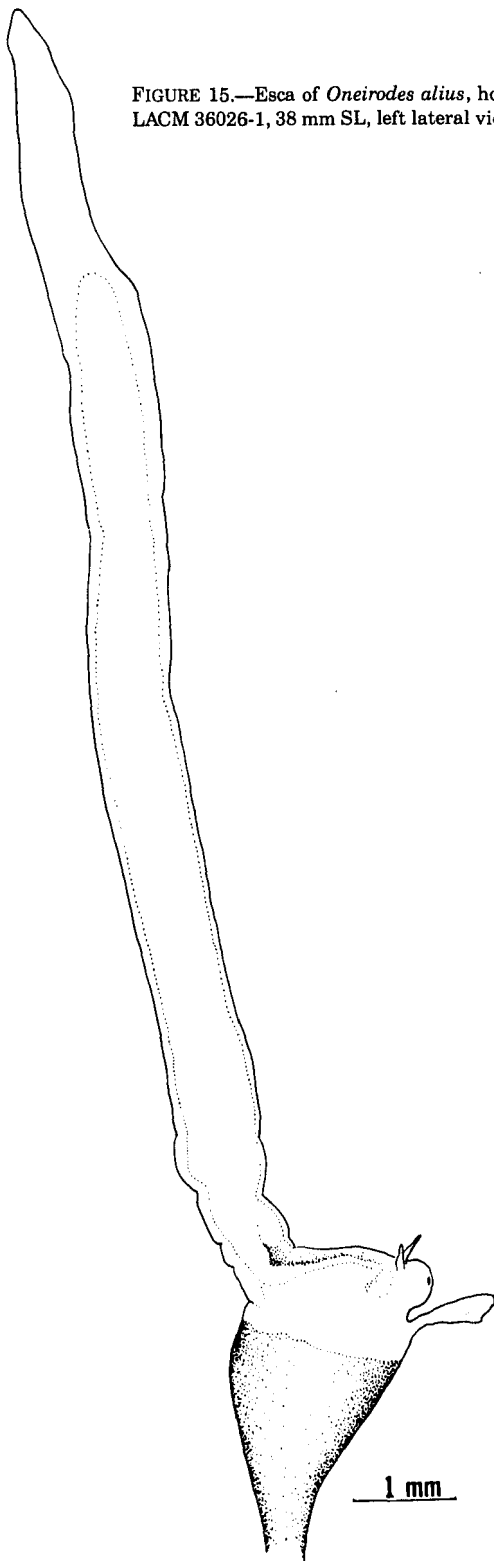
Oneirodes alius Seigel and Pietsch 1978, Figure 15, Table 4

Material.—LACM 36026-1, 38 mm SL, stn 122 (holotype); LACM 36027-1, 18 mm SL, stn 147 (paratype); LACM 36028-1, 21 mm SL, stn 141

TABLE 4.—Measurements and counts of specimens of *Oneirodes alius*. Measurements expressed as percentage of standard length.

Item	LACM 36089-2	LACM 36091-2	LACM 36091-2	LACM 36096-2
Standard length (mm)	10	11.5	11.5	12
Length:				
Head	45.0	39.1	39.1	37.5
Lower jaw	40.0	43.5	43.5	45.8
Premaxilla	20.0	21.7	26.1	25.0
Illicium	20.0	17.4	17.4	16.7
Head depth	40.0	34.8	34.8	33.3
Teeth:				
Vomer	4	4	4	4
Upper jaw	—	—	—	14
Lower jaw	—	—	18	16
Dorsal fin rays	5	5	7	6
Anal fin rays	4	4	4	4
Pectoral fin rays	15	—	15	16

FIGURE 15.—Esca of *Oneirodes alius*, holotype, LACM 36026-1, 38 mm SL, left lateral view.



(paratype); LACM 36089-2, 10 mm SL, stn 137; LACM 36091-2, 2(11.5 mm SL), stn 142; LACM 36096-2, 12 mm SL, stn 150.

Oneirodes alius, a member of the *O. schmidti* group (Pietsch 1974a), was originally described from three specimens collected by the *Alpha Helix* in the Halmahera Sea (Seigel and Pietsch 1978). After the description went to press, four additional specimens were sorted out from *Alpha Helix* stations made in approximately the same localities as the type-material. In all respects, these specimens compare well with the original description.

Oneirodes schmidti (Regan and Trewavas 1932),
Figures 16, 17; Table 5

Material.—LACM 36031-3, 15.5 mm SL, stn 58; LACM 36057-3 2(65-92 mm SL), stn 93; LACM 36067-3, 78 mm SL, stn 23.

The 1975 Southeast Asian Bioluminescence Expedition of the *Alpha Helix* provided the first representatives of *O. schmidti* since the capture of the holotype by the *Dana* in 1929. The new material compares well with the type-specimen in all characters, except for some minor differences in esca morphology. The species is redescribed below based on the new *Alpha Helix* material.

Description.—Escal appendage pattern C (Pietsch 1974a, fig. 60C); esca with a large, complex anterior appendage consisting of a wide, compressed base bearing a relatively short, unpaired and branched filament on posterior margin, two extremely long, distal filaments (about 16.3 to 17.3% of SL) that bifurcate as many as five times, and a stout, bifurcated, medial filament each branch of which becomes highly branched distally; a pair of filamentous, highly branched, medial appendages less than length of esca bulb; terminal papilla

TABLE 5.—Measurements and counts of *Oneirodes schmidti*. Measurements expressed as percentage of standard length.

Item	LACM 36031-3	LACM 36067-3	LACM 36057-3	LACM 36057-3
Standard length (mm)	15.5	78	92	65
Length:				
Head	45.2	44.9	46.2	47.7
Lower jaw	51.7	51.3	52.7	52.3
Premaxilla	38.7	35.9	36.4	40.0
Iliacium	35.5	107.7	91.3	87.7
Head depth	38.7	46.1	42.4	46.1
Teeth:				
Vomer	4	6	5	5
Upper jaw	29	66	67	62
Lower jaw	36	57	56	65
Dorsal fin rays	6	6	5	6
Anal fin rays	4	4	4	4
Pectoral fin rays	16	16	17	16

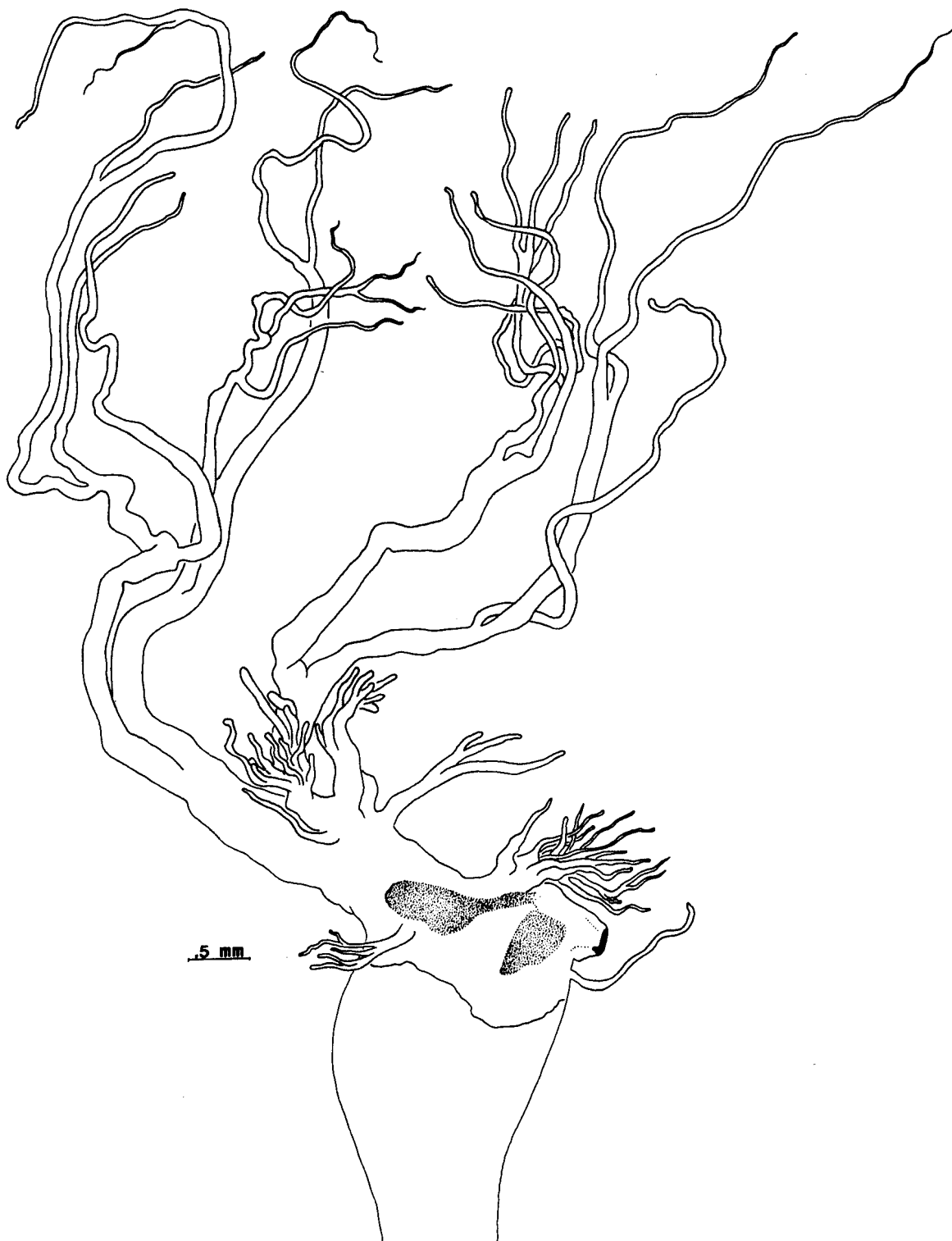


FIGURE 16.—Esca of *Oneirodes schmidti*, LACM 36057-3, 65 mm SL, left lateral view.

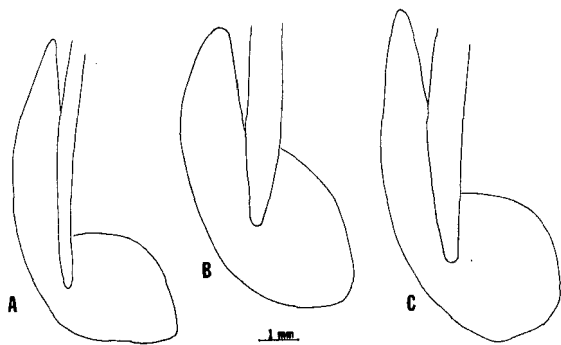


FIGURE 17.—Subopercula of *Oneirodes schmidti*, right lateral views: A. LACM 36057-3, 65 mm SL; B. LACM 36067-3, 78 mm SL; C. LACM 36057-3, 92 mm SL.

with a single, distal streak of pigment; a slender, unbranched posterior appendage less than length of esca bulb; a relatively short, filamentous, branched, anterolateral appendage on each side (the inner pair of stout, anterolateral appendages described for the holotype of *O. schmidti* by Pietsch 1974a: 78, fig. 99, correspond to the elongate, bifurcated filaments that are associated with

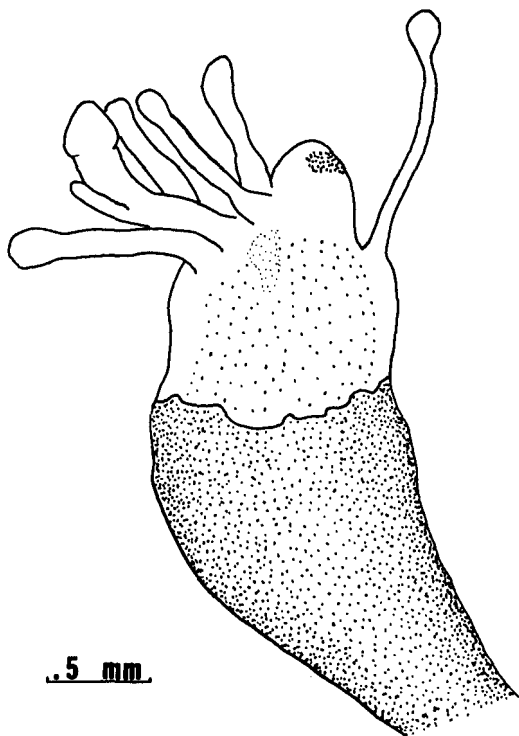


FIGURE 18.—Esca of *Oneirodes micronema*, holotype, LACM 36039-3, 89 mm SL, left lateral view.

the anterior appendage of the new material; Figure 16).

Suboperculum long and narrow, upper part tapering without indentation on posterior margin (Figure 17; Pietsch 1974a:78, fig. 98); length of lower fork of operculum 26.6-27.7% of SL; ratio of lengths of upper and lower forks of operculum 0.47-0.51.

Epibranchial teeth absent; teeth present on pharyngobranchial II.

Counts and measurements in Table 5.

Distribution.—All five known specimens of *O. schmidti*, including the holotype, were collected in the Banda Sea.

Oneirodes micronema Grobecker 1978, Figure 18.

Material.—LACM 36039-3, 89 mm SL, stn 113 (holotype); LACM 36043-3, 17 mm SL, stn 157 (paratype).

This species, a member of the *O. schmidti* group (Pietsch 1974a), was recently described by Grobecker (1978) based on two females collected in the Banda Sea.

Oneirodes sp. of *Oneirodes schmidti* Group,
Bertelsen 1951

Material.—LACM 36046-6, metamorphosed female, 13 mm SK, stn 97 (illicium length 36.9% of SL).

Oneirodes sp.

Material.—Adolescent and adult males and females, and metamorphosing stages not identifiable to species or species group. Metamorphosed females representing possible new species: LACM 36087-5, 13 mm SL, stn 135 (illicium 15.4% of SL, upper jaw teeth 14, lower jaw teeth 21, pectoral fin rays 15); LACM 36089-5, 14 mm SL, stn 137 (illicium 14.3% of SL, upper jaw teeth 15, lower jaw teeth 20, pectoral fin rays 15; esca like that of LACM 36087-5); LACM 36115-2, 21 mm SL, stn 102 (illicium 23.8% of SL, upper jaw teeth 27, lower jaw teeth 38, pectoral fin rays 16). Metamorphosing females: LACM 36121-1, 2(7.5-9 mm SL), stn 178; LACM 36106-2, 8.5 mm SL, stn 187; LACM 36088-3, 9.5 mm SL, stn 136; LACM 36049-3, 9.5 mm SL, stn 194; LACM 36073-3, 10 mm SL, stn 94; LACM 36087-3, 10 mm SL, stn 135; LACM 36028-4, 10 mm SL, stn 141; LACM

36046-5, 11 mm SL, stn 97; LACM 36027-3, 11 mm SL, stn 147; LACM 36076-4, 11.5 mm SL, stn 26. Metamorphosed males: LACM 36108-2, 8.5 mm SL, stn 192; LACM 36087-2, 4(9-10 mm SL), stn 135; LACM 36081-2, 3(9.5 mm SL), stn 127a; LACM 36104-2, 2(9.5-11.5 mm SL), stn 175; LACM 36039-5, 2(10-11 mm SL), stn 113; LACM 36024-4, 3(10-12 mm SL), stn 81; LACM 36057-5, 2(10-12 mm SL), stn 93; LACM 36023-4, 4(10-12 mm SL), stn 143; LACM 36028-3, 3(10-13.5 mm SL), stn 141; LACM 36048-4, 10.5 mm SL, stn 36; LACM 36073-5, 2(10-5 mm SL), stn 94; LACM 36117-2, 10.5 mm SL, stn 173; LACM 36109-4, 10.5 mm SL, stn 193; LACM 36119-1, 2(10.5-13.5 mm SL), stn 96; LACM 36026-2, 11 mm SL, stn 122; LACM 36090-2, 3(11-12 mm SL), stn 138; LACM 36027-3, 11 mm SL, stn 147; LACM 36118-2, 11 mm SL, stn 180; LACM 36076-6, 12 mm SL, stn 26; LACM 36095-2, 12 mm SL, stn 149; LACM 36077-4, 12 mm SL, stn 155; LACM 36122-1, 12 mm SL, stn 179; LACM 36084-2, 2(12-12.5 mm SL), stn 130; LACM 36091-3, 2(12-12.5 mm SL), stn 142; LACM 36089-3, 6(12-13 mm SL), stn 137; LACM 36085-2, 3(12-14 mm SL), stn 133; LACM 36120-1, 12.5 mm SL, stn 123; LACM 36041-4, 4(12.5-13 mm SL), stn 39; LACM 36088-2, 13 mm SL, stn 136; LACM 36024-3, 13 mm SL, stn 81.

Danaphryne Bertelsen 1951

Danaphryne nigrifilis (Regan and Trewavas 1932)

Danaphryne nigrifilis is known from eight specimens, one of which (the holotype, 24 mm SL, ZMUC P92102) was collected by the *Dana* in the South China Sea (Bertelsen and Pietsch 1977). No additional material was provided by the *Alpha Helix*.

Microlophichthys Regan and Trewavas 1932

Microlophichthys microlophus (Regan 1925)

Material.—LACM 36024-7, male, 17 mm SL, stn 81; LACM 36048-3, female, 22 mm SL, stn 36; LACM 36047-3, female 29 mm SL, stn 89.

Twenty-three metamorphosed females of this species (12-99 mm SL) have been previously reported from localities in the Atlantic, Indian, and Pacific Oceans (Bertelsen and Pietsch 1977). Two additional females and a male were collected by the *Alpha Helix* in the Banda and Ceram Seas. In

all respects, these specimens fall within the observed variation of *M. microlophus*.

Chiophryne Regan and Trewavas

Chiophryne xenolophus Regan and Trewavas 1932

Chiophryne xenolophus is known from only two specimens, the holotype (11 mm SL, ZMUC P9296) collected by the *Dana* in the South China Sea, and a second specimen (22 mm SL, SIO 70-306) from off Japan at about lat. 32°10' N, long. 136°05' E (Pietsch 1978).

Dolopichthys Garman 1899

Dolopichthys pullatus Regan and Trewavas 1932

Material.—LACM 36116-2, 113 mm SL, stn 84.

Thirty-three metamorphosed females of *D. pullatus* (10-115 mm) have been previously reported from localities in the Atlantic, the Gulf of Mexico, and the eastern Pacific and Indian Oceans (Pietsch 1972). The holotype of *D. pullatus* is the only previous record from the western Pacific. One additional specimen collected by the *Alpha Helix* from the Banda Sea constitutes the second record from the Indo-West Pacific Ocean.

Dolopichthys longicornis Parr 1927

Material.—LACM 36046-3, 8.5 mm, stn 97.

Dolopichthys longicornis was previously known from 18 metamorphosed females (14-159 mm) collected from the Atlantic, Indian, and eastern Pacific Oceans (Pietsch 1972). The holotype of *D. mucronatus* (= *D. longicornis*), collected in the South China Sea, is the only previous western Pacific record. An additional specimen was collected by the *Alpha Helix* in the Banda Sea.

Dolopichthys sp.

Material.—LACM 36071-2, metamorphosed male, 12 mm, stn 59.

Chaenophryne Regan 1925

Chaenophryne longiceps Regan 1925

Material.—LACM 36039-4, metamorphosed male, 10.5 mm, stn 113.

This species has a cosmopolitan distribution in all three major oceans of the world (Pietsch 1975).

A single male taken by the *Alpha Helix* in the Banda Sea constitutes the second record for this species in southeast Asian waters.

Chaenophryne draco Beebe 1932

Material.—LACM 36073-6, 17 mm, stn 94; LACM 36123-1, 21.5 mm, stn 80.

Chaenophryne draco has a wide distribution occurring in all three major oceans of the world (Pietsch 1975). Two metamorphosed females collected by the *Alpha Helix* in the Banda Sea constitute the first records of this species in southeast Asian waters.

Chaenophryne sp. of *Chaenophryne draco* Group

Material.—LACM 36046-7, metamorphosed male, 10 mm, stn 97.

Pentherichthys Regan and Trewavas

Pentherichthys sp.

The genus *Pentherichthys* is represented in southeast Asian waters by only two larval specimens (Bertelsen 1951). No additional material was provided by the *Alpha Helix*.

Lophodolos Lloyd 1909

Lophodolos indicus Lloyd 1909

Material.—LACM 36116-4, 69 mm, stn 84.

Twenty-two female specimens of this species were previously recorded from localities in the eastern Atlantic, and the Indian and Pacific Oceans between about lat. 4° S and 30° N (Pietsch 1974b). One additional specimen was collected by the *Alpha Helix* in the Banda Sea.

Oneirodidae gen. et sp.?

Material.—Two metamorphosing males: LACM 36069-3, 11 mm, stn 28; LACM 36039-3, 11.5 mm, stn 113.

These two metamorphosing males cannot be reasonably placed within any known oneirodid genus. Both are very similar in having the following characteristics:

Description.—Nostrils opening forward; skin between anterior nostrils lightly pigmented; pos-

terior nostril well separated from eye; operculum deeply notched posteriorly; suboperculum short and broad, upper end rounded; inner side of suboperculum darkly pigmented; subdermal pigment continuous over body to posterior margin of caudal peduncle; pectoral rays on end of a relatively short, broad lobe; dorsal fin rays 6, anal fin rays 4, pectoral fin rays 15.

Comments.—These males are similar to *Oneirodes* and *Microlophichthys* in having a short, rounded suboperculum. They differ from *Oneirodes*, however, in having the skin between the anterior nostrils lightly pigmented, the inner surface of the suboperculum darkly pigmented, and the body covered with subdermal pigment to the base of the caudal fin. On the other hand, they differ from *Microlophichthys* in the absence of a distinct, separate patch of pigment on the caudal peduncle, and in having four, instead of five anal fin rays.

THAUMATICHTHYIDAE

Thaumatichthys Smith and Radcliffe 1912

Thaumatichthys pagidostomus
Smith and Radcliffe 1912

Thaumatichthys pagidostomus is known from only the holotype (60 mm SL, USNM 72952) collected by the *Albatross* off Sulawesi (Bertelsen and Struhsaker 1977).

CENTROPHRYNIDAE

Centrophryne Regan and Trewavas 1932

Centrophryne spinulosa Regan and Trewavas 1932

Centrophryne spinulosa is known from 15 metamorphosed females and 2 metamorphosing males. The lectotype (39 mm SL female, ZMUC P92122), collected by the *Dana* off the northern coast of New Guinea, is the only record from the western Pacific (Pietsch 1972).

CERATIIDAE

Key to Females of Genera and Species of Ceratiidae

1A. Illicium long, much longer than bulb

of esca; 2 caruncles on back; subopercle without spine on anterior margin

- *Ceratias* sp.
 1B. Illicium short, nearly completely enveloped by bulb of esca; 3 caruncles on back; subopercle with spine on anterior margin *Cryptopsaras couesi* Gill

Ceratias Kröyer 1845

Ceratias sp.

Material.—LACM 36046-9, 9 mm, stn 97; LACM 36034-3, 2(10-18 mm), stn 85; LACM 36047-4, 10.5 mm, stn 89; LACM 36073-7, 11 mm, stn 94; LACM 36125-1, 12 mm, stn 72; LACM 36032-5, 13 mm, stn 110; LACM 36074-4 13.5 mm, stn 120; LACM 36076-7, 13.5 mm, stn 26; LACM 36027-4, 15 mm, stn 147; LACM 36064-2, 16.5 mm, stn 152; LACM 36058-2, 18 mm, stn 99; LACM 36029-2, 23 mm, stn 162; LACM 36093-2, 25 mm, stn 146.

Fourteen female specimens of the genus *Ceratias* were collected by the *Alpha Helix* from the Banda, Celebes, Ceram, and Halmahera Seas. All of these are adolescent females in which the diagnostic characters of the esca have not as yet developed. Since there are two, perhaps three species of *Ceratias* (Bertelsen 1951), specific identification is impossible at this time.

Cryptopsaras Gill 1883

Cryptopsaras couesi Gill 1883

Material.—LACM 36031-4, 8 mm, stn 58; LACM 36090-3, 3(8.5-12.5 mm), stn 138; LACM 36029-3, 2(9.5-10 mm), stn 162; LACM 36042-2, 10 mm, stn 74; LACM 36074-5, 10 mm, stn 120; LACM 36034-4, 10 mm, stn 85; LACM 36100-3, 10 mm, stn 166; LACM 36109-5, 10 mm, stn 193; LACM 36087-8, 2(10-10.5 mm), stn 135; LACM 36040-4, 3(10-10.2 mm), stn 27; LACM 36051-4, 11 mm, stn 38; LACM 36028-6, 11 mm, stn 141; LACM 36129-1, 11 mm, stn 181; LACM 36130-1, 11 mm, stn 186; LACM 36085-4, 2(11-13 mm), stn 133; LACM 36089-6, 11.5 mm, stn 137; LACM 36063-3, 11.5 mm, stn 140; LACM 36077-5, 2(11.5-12.5 mm), stn 155; LACM 36127-1, 12 mm, stn 167; LACM 36122-3, 12 mm, stn 179; LACM 36126-1, 12.5 mm, stn 18; LACM 36037-2, 12.5 mm, stn 82; LACM 36117-3, 12.5 mm, stn 173; LACM 36084-3, 6(12.5-85 mm), stn 130; LACM 36055-2, 13 mm, stn 79; LACM 36091-5, 13 mm, stn 142; LACM

36108-3, 13 mm, stn 192; LACM 36067-4, 14 mm, stn 23; LACM 36075-5, 14 mm, stn 121; LACM 36064-3, 4(14-19.5 mm), stn 152; LACM 36080-2, 16 mm, stn 126; LACM 36128-1, 19.5 mm, stn 91; LACM 36073-8, 59 mm, stn 94; LACM 36124-2, 94 mm, stn 112.

Cryptopsaras couesi has a cosmopolitan distribution in all three major oceans of the world (Bertelsen 1951). Fifty specimens were collected by the *Alpha Helix* from the Banda, Celebes, Halmahera, Sulu, and Timor Seas.

GIGANTACTINIDAE

Gigantactis Brauer 1902

Gigantactis vanhoeffeni Brauer 1902

Material.—LACM 36031-1, 17 mm, stn 58; LACM 36039-6, 2(24-31 mm), stn 113; LACM 36032-1, 25 mm, stn 110; LACM 36046-10, 26 mm, stn 97; LACM 36131-1, 32 mm, stn 51; LACM 36034-5, 34 mm, stn 85.

The *Alpha Helix* collected seven females (six metamorphosed and one in metamorphosis) of *G. vanhoeffeni*, all from the Banda Sea. These have been incorporated in a forthcoming revision of the Gigantactinidae (Bertelsen et al. in press).

Gigantactis sp. Male Group II, Bertelsen et al. in press

Material.—LACM 36034-1, 2(12-12.5 mm), stn 85; LACM 36033-1, 2(13-14 mm), stn 88; LACM 36032-1, 13.5 mm, stn 110.

Gigantactis sp. Male Group IV, Bertelsen et al. in press

Material.—LACM 36030-1, 16.5 mm, stn 109.

Gigantactinidae gen. et sp.?

Material.—LACM 36024-6, male, 11.5 mm, stn 81.

This male cannot reasonably be placed within either of the two known gigantactinid genera (Bertelsen et al. in press).

LINOPHRYNIDAE

Key to Females of Genera and Species of Southeast Asian Linophrynididae

- 1A. Skin transparent; hyoid barbel absent;

- jaw teeth small and numerous
 *Edriolychnus schmidti* Regan
 1B. Skin darkly pigmented; hyoid barbel present; teeth large and few
 *Linophryne* Collett. . 2
 2A. Distal esca appendages present; barbel distally divided into about 6 branches
 *Linophryne corymbifera*
 Regan and Trewavas
 2B. Distal esca appendages absent; barbel unbranched
 *Linophryne trewavasae* Bertelsen

Edriolychnus Regan 1925

Edriolychnus schmidti Regan 1925

Edriolychnus schmidti is a relatively common ceratioid occurring in all three major oceans of the world (Bertelsen 1951). No additional material, however, was provided by the *Alpha Helix* in 1975.

Linophryne Collett 1886

Linophryne corymbifera Regan and Trewavas 1932

Material.—LACM 36046-11, female, 42 mm SL with parasitic male, 9.5 mm SL, stn 97.

A single female with parasitic male, representing the first known incidence of sexual parasitism in this species, was collected by the *Alpha Helix* in the Banda Sea. The specimen was referred to as *Linophryne* sp. A by Hansen and Herring (1977), and recently described and figured by Bertelsen (1978).

Linophryne trewavasae Bertelsen 1978

Material.—LACM 36116-5, female, 73.5 mm SL with parasitic male, 10.7 mm SL, stn 84 (holotype).

Linophryne trewavasae was recently described by Bertelsen (1978) from a single female with an attached male collected by the *Alpha Helix* in the Banda Sea. The specimen was referred to as *Linophryne* sp. B by Hansen and Herring (1977).

Linophryne sp. male

Material.—LACM 36088-5, a male, 15 mm SL, stn 136.

This single male specimen could not be identified to species.

ACKNOWLEDGMENTS

We thank E. Bertelsen for critically reading the manuscript and offering valuable suggestions. The following people and institutions provided material: Bruce H. Robison, Marine Science Institute, University of California Santa Barbara; Robert J. Lavenberg and Jerry W. Neumann, LACM; John R. Paxton, AMS; Robert H. Gibbs and Susan Karnella, USNM; and Richard H. Rosenblatt and Jan Pulsifer, SIO. The work was supported by National Science Foundation Grants GB-40700, DEB 76-82279 and DEB 7826540, the National Geographic Society, and PHS Biomedical Research Support Grant No. RR-07096 administered through the Graduate School Research Fund of the University of Washington.

LITERATURE CITED

BAKER, A. DE C., M. R. CLARKE, AND M. J. HARRIS.
 1973. The N.I.O. combination net (RMT 1+8) and further developments of rectangular midwater trawls. *J. Mar. Biol. Assoc. U.K.* 53:167-184.
 BEEBE, W.
 1932. Nineteen new species and four post-larval deepsea fish. *Zoologica (N.Y.)* 13:47-107.
 BERTELSEN, E.
 1951. The ceratioid fishes. *Ontogeny, taxonomy, distribution and biology.* Dana Rep., Carlberg Found. 39, 276 p.
 1978. Notes on *linophrynids* IV. A new species of deep-sea anglerfish of the genus *Linophryne* and the first record of a parasitic male in *Linophryne corymbifera* (Pisces, Ceratioidei). *Steenstrupia* 5(3):25-32.
 BERTELSEN, E., AND T. W. PIETSCH.
 1975. Results of the research cruises of FRV "Walther Herwig" to South America. XXXVIII. Osteology and relationships of the ceratioid anglerfish genus *Spiniphryne* (family Oneirodidae). *Arch. Fischereiwiss.* 26(1):1-11.
 1977. Results of the research cruises of FRV "Walther Herwig" to South America. XLVII. Ceratioid anglerfishes of the family Oneirodidae collected by the FRV "Walther Herwig". *Arch. Fischereiwiss.* 27(3):171-189.
 BERTELSEN, E., T. W. PIETSCH, AND R. J. LAVENBERG.
 In press. Morphology, systematics and distribution of ceratioid anglerfishes of the family Gigantactinidae. *Nat. Hist. Mus. Los Ang. Cty. Contrib. Sci.*
 BERTELSEN, E., AND P. J. STRUHSÄKER.
 1977. The ceratioid fishes of the genus *Thaumatichthys*. Osteology, relationships, distribution and biology. *Galathea Rep.* 14:7-40.
 BRADBURY, M. G.
 1967. The genera of batfishes (family Ogocephalidae). *Copeia* 1967:399-422.
 BRAUER, A.
 1902. Diagnosen von neuen Tiefseefischen, welche von der Valdivia-Expedition gesammelt sind. *Zool. Anz.* 25:277-298.

- CLARKE, M. R.
1969. A new midwater trawl for sampling discrete depth horizons. *J. Mar. Biol. Assoc. U.K.* 49:945-960.
- COLLETT, R.
1886. On a new pediculate fish from the sea off Madeira. *Proc. Zool. Soc. Lond.* 1886:138-143.
- GARMAN, S.
1899. Reports on an exploration off the west coasts of Mexico, Central and South America, and off the Galapagos Islands, in charge of Alexander Agassiz, by the U.S. Fish Commission Steamer "Albatross" during 1891, Lieut.-Commander Z. L. Tanner, U.S.N., commanding. XXVI. The fishes. *Mem. Mus. Comp. Zool. Harv. Coll.* 24, 431 p.
- GILL, T. N.
1883. *Cryptosaras couesi*. *Forest and Stream*. Nov. 8, 1883, p. 284.
- GOODE, G. B., AND T. H. BEAN.
1896. Oceanic ichthyology, a treatise on the deep-sea and pelagic fishes of the world, based chiefly upon the collections made by the steamers *Blake*, *Albatross*, and *Fish Hawk* in the northwestern Atlantic. U.S. Natl. Mus. Spec. Bull. 2, 553 p.
- GROBECKER, D. B.
1978. A new species of anglerfish, Genus *Oneiroides* (Oneirodidae), from the Banda Sea. *Copeia* 1978:567-568.
- GÜNTHER, A.
1864. On a new genus of pediculate fish from the sea of Madeira. *Proc. Zool. Soc. Lond.* 1864:301-303.
1887. Report on the deep-sea fishes collected by H.M.S. *Challenger* during the years 1873-1876. *Rep. Sci. Res. Voy. H.M.S. Challenger*, Zool. 22:1-335.
- HANSEN, K., AND P. J. HERRING.
1977. Dual bioluminescent systems in the anglerfish genus *Linophryne* (Pisces: Ceratioidea). *J. Zool. (Lond.)* 182:103-124.
- HOPKINS, T. L., R. C. BAIRD, AND D. M. MILLIKEN.
1973. A messenger-operated closing trawl. *Limnol. Oceanogr.* 18:488-490.
- KRÖYER, H.
1845. Ichthyologiske bidrag 10. *Cerantias holboelli*. *Naturhist. Tidsskr.* 1(2):639-649.
- LLOYD, R. E.
1909. A description of the deep-sea fish caught by the R. I. M. S. Ship "Investigator" since the year 1900, with supposed evidence of mutation in *Malthopsis*. *Mem. Indian Mus. (Calcutta)* 2(3):139-180.
- LÜTKEN, C. F.
1871. *Oneiroides eschrichtii* Ltk. en ny grønlandsk Tudefisk. *Overs. K. Dan. Vidensk. Selsk. Forh.* 1871:56-74.
- PARR, A. E.
1927. Scientific results of the third Oceanographic Expedition of the "Pawnee" 1927. *Bull. Bingham. Oceanogr. Collect., Yale Univ.* 3(1), 34 p.
- PIETSCH, T. W.
1972. A review of the monotypic deep-sea anglerfish Family Centrophrynidae: taxonomy, distribution and osteology. *Copeia* 1972:17-47.
1974a. Osteology and relationships of ceratioid anglerfishes of the family Oneirodidae, with a review of the genus *Oneiroides* Lütken. *Nat. Hist. Mus. Los Ang. Cty., Sci. Bull.* 18, 113 p.
1974b. Systematics and distribution of ceratioid anglerfishes of the genus *Lophodolos* (family Oneirodidae). *Breviora* 425:1-19.
1975. Systematics and distribution of ceratioid anglerfishes of the genus *Chaenophryne* (family Oneirodidae). *Bull. Mus. Comp. Zool.* 147:75-99.
1978. A new genus and species of ceratioid anglerfish from the North Pacific Ocean with a review of the allied genera *Ctenochirichthys*, *Chirophryne* and *Leptacanthichthys*. *Nat. Hist. Mus. Los Ang. Cty., Contrib. Sci.* 297, 25 p.
1979. Systematics and distribution of ceratioid anglerfishes of the family Caulophrynidae with the description of a new genus and species from the Banda Sea. *Nat. Hist. Mus. Los Ang. Cty., Contrib. Sci.* 310:1-25.
- 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. *Fish. Bull., U.S.* 78:59-87.
- PIETSCHMANN, V.
1926. Ein neuer Tiefseefisch aus der Ordnung der Pediculati. *Anz. Akad. Wiss. Wien* 63:88-89.
- REGAN, C. T.
1925. New ceratioid fishes from the N. Atlantic, the Caribbean Sea, and the gulf of Panama, collected by the "Dana." *Ann. Mag. Nat. Hist., Ser. 8*, 8:561-567.
- REGAN, C. T., AND E. TREWAVAS.
1932. Deep-sea angler-fish (Ceratioidea). *Dana Rep., Carlsberg Found.* 2, 113 p.
- REINHARDT, J.
1837. Ichthyologiske bidrag til den grønlandske fauna. *Dan. Vidensk. Selsk. Afh.* 4(7):83-196.
- SEIGEL, J. A., AND T. W. PIETSCH.
1978. A new species of the ceratioid anglerfish genus *Oneiroides* (Pisces: Lophiiformes) from the Indo-West Pacific. *Copeia* 1978:11-13.
- SMITH, H. M., AND L. RADCLIFFE.
1912. Description of a new family of pediculate fishes from Celebes. *Proc. U.S. Natl. Mus.* 42:579-581.
- UWATE, K. R.
1979. Revision of the anglerfish Diceratiidae with descriptions of two new species. *Copeia* 1979:129-144.

APPENDIX TABLE 1.—*Alpha Helix* stations that yielded Ceratioidei during the Southeast Asian Bioluminescence Expedition of 1975. Coordinates are for starting position only.

Station	Sea	Latitude	Longitude	Gear depth(m)	Time (h)	Date
18	Timor	8°49.8' S	129°43.0' E	0-550	0900-1400	20 March
23	Banda	4°39.2' S	129°54.1' E	0-2,000	2225-0530	26 March
24	Banda	4°39.1' S	129°53.7' E	0-2,000	0115-0745	28 March
25	Banda	4°16.8' S	129°34.4' E	0-1,800	2010-0340	28 March
26	Ceram	2°46.0' S	127°53.7' E	0-1,500	0150-0800	31 March
27	Ceram	2°45.3' S	127°55.1' E	0-2,000	0150-0800	1 April
28	Ceram	3°14.8' S	127°38.0' E	0-100	2035-2205	1 April
36	Banda	4°54.0' S	129°30.5' E	830-1,050	1440-1620	11 April
37	Banda	4°56.3' S	129°25.5' E	0-2,000	1900-0155	11 April
38	Banda	4°40.4' S	129°39.0' E	0-780	0320-0530	12 April
39	Banda	4°45.6' S	129°51.2' E	0-1,000	0950-1435	13 April
51	Banda	4°56.2' S	129°50.0' E	550-815	1545-1655	14 April
58	Banda	4°54.5' S	129°48.4' E	650-810	1200-1400	16 April
59	Banda	4°57.3' S	129°44.0' E	1,100-1,300	1555-1755	16 April
66	Banda	4°54.0' S	129°47.5' E	1,500-2,000	1515-1815	17 April
71	Banda	4°55.5' S	129°39.0' E	1,500-2,000	1048-1523	19 April
72	Banda	4°48.5' S	129°58.0' E	0-600	1645-1905	19 April
74	Banda	5°04.0' S	129°54.5' E	720-990	0041-0241	19 April
79	Banda	4°57.5' S	129°51.0' E	0-710	1845-2200	27 April
80	Banda	4°48.7' S	129°47.2' E	0-710	2314-0220	28 April
81	Banda	4°56.5' S	129°59.5' E	1,000-1,500	0416-0616	28 April
82	Banda	5°02.8' S	130°07.0' E	0-690	0745-1050	28 April
84	Banda	5°04.5' S	130°12.0' E	0-1,500	1400-2100	28 April
85	Banda	4°57.5' S	130°11.7' E	0-750	2115-0025	28 April
87	Banda	4°52.0' S	129°50.0' E	0-870	0915-1215	1 May
88	Banda	4°58.0' S	129°43.0' E	1,000-1,500	1450-1650	1 May
89	Banda	5°03.5' S	129°41.0' E	0-960	1820-2112	1 May
91	Banda	4°55.0' S	130°00.0' E	0-600	1030-1250	5 May
93	Banda	5°02.3' S	130°19.5' E	0-760	1650-2013	5 May
94	Banda	5°01.5' S	130°04.6' E	650-1,000	2245-0045	5 May
96	Banda	5°00.0' S	129°54.0' E	0-300	0520-0615	6 May
97	Banda	4°54.0' S	129°42.7' E	0-850	0700-1025	6 May
99	Banda	5°03.0' S	129°52.0' E	0-460	2020-2242	6 May
102	Banda	4°45.0' S	129°19.7' E	0-2,000	0540-1045	7 May
103	Banda	4°49.0' S	129°31.0' E	550-940	1415-1630	7 May
109	Banda	4°33.0' S	129°17.0' E	0-1,100	0030-0445	12 May
110	Banda	4°47.4' S	129°51.8' E	0-1,500	0945-1235	13 May
112	Banda	4°58.0' S	129°59.5' E	650-850	1745-1855	13 May
113	Banda	5°07.5' S	130°08.4' E	650-1,000	2120-2255	13 May
120	Halmahera	0°32.0' S	129°08.3' E	450-1,100	1125-1325	16 May
121	Halmahera	0°41.7' S	128°55.7' E	1,000-1,400	1730-1930	16 May
122	Halmahera	0°36.3' S	129°03.2' E	575-600	2240-2340	16 May
123	Halmahera	0°29.7' S	129°02.7' E	1,000-1,050	0205-0410	17 May
126	Halmahera	0°22.1' S	129°01.3' E	450-600	1042-1142	17 May
127a	Halmahera	0°04.5' S	128°26.5' E	0-750	1820-2155	17 May
130	Halmahera	0°06.0' S	128°28.7' E	600-790	0724-0933	18 May
133	Halmahera	0°05.7' N	128°24.8' E	0-680	1520-1833	18 May
135	Halmahera	0°06.2' S	128°38.3' E	820-1,000	2306-0106	18 May
136	Halmahera	0°17.4' S	128°47.5' E	1,000-1,250	0446-0646	19 May
137	Halmahera	0°08.9' S	128°40.0' E	0-960	0955-1300	19 May
138	Halmahera	0°05.1' N	128°29.0' E	750-900	2150-2250	19 May
140	Halmahera	0°00.6' S	128°46.3' E	250-320	0202-0310	20 May
141	Halmahera	0°05.0' S	128°52.7' E	1,000-1,100	0625-0855	20 May
142	Halmahera	0°10.5' S	128°33.3' E	750-1,000	1200-1400	20 May
143	Halmahera	0°14.5' S	128°46.7' E	1,250-1,500	1715-1930	20 May
146	Halmahera	0°36.2' S	129°12.0' E	420-600	0437-0537	21 May
147	Halmahera	0°40.0' S	128°58.5' E	0-1,200	0635-0935	21 May
149	Halmahera	0°22.5' S	128°57.8' E	420-600	1640-1740	21 May
150	Halmahera	0°18.5' S	129°00.8' E	700-1,000	2003-2203	21 May
152	Halmahera	0°13.0' S	129°06.5' E	180-300	0145-0345	22 May
155	Halmahera	0°38.6' S	129°05.6' E	680-850	1210-1400	22 May
157	Banda	4°09.6' S	130°50.0' E	0-840	0215-0615	24 May
162	Celebes	2°37.6' N	124°46.5' E	550-800	0917-1117	1 June
166	Sulu	7°10.7' N	121°25.6' E	660-800	0712-0900	3 June
167	Sulu	7°19.2' N	121°20.1' E	950-1,100	1210-1410	3 June
173	Sulu	8°06.3' N	121°13.2' E	730-810	0645-0845	4 June
175	Sulu	8°28.3' N	121°15.0' E	920-1,100	1422-1622	4 June
178	Sulu	8°47.0' N	121°26.0' E	790-910	0200-0330	5 June
179	Sulu	8°58.5' N	121°42.2' E	1,500-2,000	0605-1005	5 June
180	Sulu	9°06.0' N	121°51.0' E	710-790	1340-1550	5 June
181	Sulu	9°16.8' N	122°02.2' E	820-950	1905-2105	5 June
183	Sulu	9°24.5' N	122°12.3' E	690-890	0115-0215	6 June
184	Sulu	9°18.0' N	122°10.0' E	480-550	0355-0455	6 June
186	Sulu	9°03.7' N	122°03.6' E	360-640	0936-1036	6 June
187	Sulu	8°53.0' N	122°01.5' E	830-900	1255-1455	6 June
192	Sulu	9°08.0' N	122°02.5' E	800-900	0500-0700	7 June
193	Sulu	9°21.5' N	122°14.7' E	800-1,100	1020-1240	7 June
194	Sulu	9°28.3' N	122°06.8' E	0-1,500	1350-1740	7 June