

PHOTONECTES MUNIFICUS, A NEW SPECIES OF
MELANOSTOMIATID FISH FROM THE SOUTH PACIFIC
SUBTROPICAL CONVERGENCE, WITH REMARKS
ON THE CONVERGENCE FAUNA

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ABSTRACT: *Photonectes munificus*, a new species in the stomiatoid family Melanostomiidae, is described from a single specimen from the Subtropical Convergence of the South Pacific. The holotype, 371 mm standard length, is the largest ever recorded for the genus and is distinguished from other species by the highest IV and OV photophore counts (49-50 and 38), the lowest VAL count (2-4), and the greatest number of vertebrae (67). It most closely resembles species in the subgenus *Trachinostomias*, which have the dorsal and anal fins covered with black skin, and especially *P. (T.) margarita*, which, like *P. munificus*, often lacks the pectoral fin. A distinct circumglobal Subtropical Convergence fauna is characterized by nine restricted species of stomiatoids, and *P. munificus* is attributed to it.

A specimen of the genus *Photonectes*, collected in the Subtropical Convergence during cruise 24 of the USNS *Eltanin*, is the largest ever recorded for the genus and represents a previously undescribed species. Although there is confusion regarding the species of *Photonectes*, I have completed enough of a revisionary study to assure the validity of the new species.

Photonectes munificus new species

Fig. 1

Holotype—Los Angeles County Museum of Natural History (LACM) 11282-1; female, 371 mm standard length. USNS ELTANIN, USC Station 1777; 41°50'S, 130°12'W to 41°46'S, 130°16'W; 14 August 1966. Ten-foot (3m) Isaacs-Kidd midwater trawl, surface to maximum depth of ca. 440 m. Local time 2050-2317 hours, two hours at depth.

Diagnosis—Dorsal and anal fins covered with black skin; pectoral fin absent; IV photophores 49-50; OV 38; VAL 2-4; vertebrae 67.

Description (most characters in Diagnosis not repeated)—Dorsal rays 19, the first small, the last split to the base; anal rays 21, the first tiny, the last split to the base (dorsal and anal rays counted from radiograph); pelvic rays 7. Serial photophores: IV 49 (left side), 50 (right side), those on isthmus not forming a separate group, the last three before the pelvics close together; VAV 12, anterior three and posterior four forming close groups; AC 12, the first four close together, next four more widely spaced, last four gradually becoming

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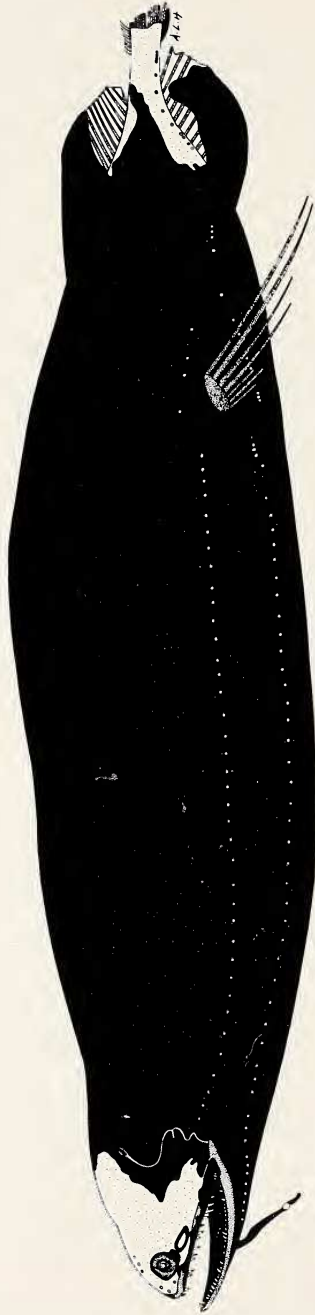


Figure 1. Holotype of *Photonectes munificus*, LACM 11282-1, 371 mm. Pale areas on the head and posterior end are due to removal of skin. Drawn by Ann Hoskins.

smaller and closer together; OV 38; VAL 4 (left side), 2 (right side), widely spaced, the last well anterior to anal-fin origin. Branchiostegal photophores 9. Vomerine teeth, one on each side. Palatine teeth, 3 on each side. Gill teeth 9, single, on lower limb only.

Measurements (in mm; percent of standard length in parentheses)—standard length 371; snout to dorsal origin 300.1 (80.7); snout to anal origin 313.1 (84.2); snout to pelvic insertion 258.3 (69.5); head length 49.1 (13.2); snout to anterior bony margin of orbit 8.9 (2.4); fleshy orbit length 7.0 (1.9); postocular organ, pale part only 4.0 (1.1), entire black surrounding area 6.9 (1.9); upper jaw length 43.3 (11.6); body depth behind head 48.8 (13.1); greatest body depth 77.4 (20.8); least caudal peduncle depth 8.2 (2.2); pelvic fin length 91.4 (24.6); length of dorsal fin base 51.4 (13.8); length of anal base 51.5 (13.9).

Barbel with a small bulb, but broken distally; length to end of bulb 19.0 (5.1), length to broken end 22.3 (6.0).

No luminous tissue in mouth, on jaws, or on body.

Orangish eggs present, about 0.35 mm in diameter.

Relationships—The new species, *P. munificus*, is obviously closely related only to those species included in the subgenus *Trachinostomias* Parr by Morrow (in Morrow and Gibbs, 1964), who revised the subgeneric classification of Regan and Trewavas (1930). These species—*P. biflififer* Beebe, *P. fimbria* Regan and Trewavas, *P. parvimana* Regan and Trewavas, and *P. margarita* (Goode and Bean)—are characterized by dorsal and anal fins that are more or less completely covered with thick black skin, by the highest IV and OV photophore counts within the genus (total range 41-48 and 30-36 respectively), and by the highest vertebral number (the highest so far counted, either in the literature or on my numerous radiographs, is 64). The previous maximum photophore and vertebral counts in the genus *Photonectes* are, thus, exceeded by several in *P. munificus*, while the VAL count of 2-4 is much lower than the previously recorded minimum of 10 for the genus. Because pectoral fins are absent in *P. munificus*, a relationship with species of the subgenera *Photonectes* Günther and *Dolichostomias* Parr, which also lack pectorals, might be considered. Pectoral fin development in the genus *Photonectes*, however, is weak in all species, and *P. margarita* (subgenus *Trachinostomias*) may have one ray, ranging from long to very short, or may lack the ray on one or both sides. The sole known representative of the subgenus *Dolichostomias*, *P. gracilis*, is well-differentiated. It is generally more slender than other *Photonectes*, has the pelvic fins inserted before the mid-length, and has long dorsal and anal fin bases. I believe that *P. munificus* is closest to *P. margarita*.

Distribution—The capture of *P. munificus* at a depth of 0-440 m in the Subtropical Convergence suggests that this new species is a member of the fauna of the Convergence, a fauna that I believe constitutes a distinct zoogeographic region encircling the Southern Ocean. The same trawl collected *Bathophilus ater* (Brauer), another stomiatoid species of similar zoogeographic pro-

pensities. Brauer (1902) described *B. ater* from 26°49'S, 5°54'E, and M.A. Barnett and I have examined other specimens from between 27°10'S and 32°29'S, all in the southeastern Atlantic. Specimens of *B. ater* from cruises of the Eltanin show this species to occur all across the south Pacific from New Zealand to Chile at latitudes between 33° and 45° S.

Very few species of stomiatoid fishes occur south of the limits of the great central water masses or the waters underlying these water masses and fewer still are restricted to the far southern waters. I am aware of 17 species that have the Subtropical Convergence as the southern boundary of a widespread distribution (Table 1). *Stomias gracilis* is the only stomiatoid that, to my knowledge, is found only in subantarctic and antarctic waters; it is replaced by *S. boa* in the Subtropical Convergence. *Borostomias antarcticus*, an antitropical species, and *Idiacanthus atlanticus* occur in the Convergence and in more southern waters as well. Nine species of stomiatoids appear restricted to the Subtropical Convergence (Table 1), ten if *Photonectes munificus* is included. But for a recent capture in the central Atlantic, *Trigonolampa miriceps* might also be considered an antitropical member of the Convergence fauna.

Further collecting and study will doubtless confirm the reality of a Subtropical Convergence fauna. With regard to *Photonectes munificus*, I predict that future collecting will show this species to occur around the world in the Convergence and northward into the southern reaches of the Benguela and Humboldt currents.

Etymology—The specific name *munificus*, is a Latin adjective meaning bountiful, used in reference to the high meristic counts of the species and the large body size of the holotype.

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TABLE 1

Stomioid genera and species represented in the Subtropical Convergence and/or in subantarctic waters. Approximate total number of species in each genus in parentheses. SA—species occurring in subantarctic waters, CONVERGENCE—species occurring only in the Convergence (x) or also in subantarctic waters (o). S. LIMIT—species known from central waters that occur in the Convergence area. SOURCES—1. R. H. Gibbs *et al.*, unpublished; 2. W. H. Krueger, unpublished; 3. this paper; 4. Barnard, 1948; 5. Brauer, 1906; 6. Bussing, 1965; 7. Ege, 1934; 8. Ege, 1948; 9. Gibbs and Hurwitz, 1967; 10. Günther, 1887; 11. Morrow, 1964; 12. Norman, 1930. A—Atlantic Ocean. I—Indian Ocean. P—Pacific Ocean.

Genus and Species	SA	Convergence			S. Limit			Source
		A	I	P	A	I	P	
<i>Chauliodus</i> (6)								
<i>sloani</i>					x			9
<i>danae</i>					x	x		6,8
<i>Stomias</i> (9)								
* <i>boa</i> <i>boa</i>			x	x	x			1,7
<i>gracilis</i>	x							1,7
<i>Macrostomias</i> (1)								
<i>longibarba</i>					x	x		1,11
<i>Astronesthes</i> (23)								
<i>boulengeri</i>			x	x	x			1
sp. nov.			x	x				1
<i>indicus</i>						x		1
<i>Borostomias</i> (5)								
<i>antarcticus</i>	x		o	o	o			1
<i>Neonesthes</i> (2)								
<i>capensis</i>					x	x	x	1
<i>microcephalus</i>						x	x	1
<i>Eustomias</i> (35)								
<i>trewavasae</i>			x	x	x			1
<i>enbarbatus</i>						x		1
<i>Flagellostomias</i> (1)								
<i>boureei</i>						x		12

**S. boa* *boa* also has a disjunct population in the Mediterranean Sea and the adjacent eastern Atlantic.

TABLE 1 (continued)

<i>Leptostomias</i> (11)				
<i>macropogon</i>			x	12
<i>gladiator</i>				x
<i>Bathophilus</i> (18)				
<i>ater</i>	x	x		1,5
<i>irregularis</i>			x x	1,12
<i>pawneeii</i>			x	1,12
<i>nigerrimus</i>			x	1
<i>Echiostoma</i> (1)				
<i>barbatum</i>			x	1
<i>Melanostomias</i> (7)				
<i>tentaculatus</i>			x	1,12
<i>Thysanactis</i> (1)				
<i>dentex</i>			x	1
<i>Opostomias</i> (2)				
<i>micripnus</i>	x	x x		1,4,10
<i>Photonectes</i> (15)				
<i>munificus</i>				x
<i>Trigonolampa</i> (1)				
<i>miriceps</i>				x x
<i>Idiacanthus</i> (3)				
<i>atlanticus</i>	x			o o o
<i>Malacosteus</i> (1)				
<i>niger</i>				x x
Total Species 142	3	9	17	