

SYNODUS CAPRICORNIS, A NEW LIZARDFISH
FROM EASTER AND PITCAIRN ISLANDS

Roger Cressey and John E. Randall

Abstract.—*Synodus capricornis*, new species, is described from Easter and Pitcairn Islands. It is distinguished from all known Indo-West Pacific *Synodus* except *S. ulae* Schultz by its high vertebral count (64-65). The shape of the nasal flap and pigmentation on the snout separates the new species from *S. ulae*. Notes on endemism of fishes of Easter Island and the distribution of fish in Easter, Pitcairn and Rapa Islands are included.

The species described here was collected by Randall, who suggested in a popular article describing fish collecting in Easter Island (Randall, 1970) that it might be a new species. Cressey is doing a systematic revision of the Indo-west Pacific species of *Synodus* in conjunction with a comprehensive study of their copepod parasites.

Most counts and measurements were made according to Hubbs and Lagler (1958). Two characters not previously used in synodontid fishes are the shape of the nasal flap of the anterior nares and the number of peritoneal spots. The size and form of the nasal flap is consistent within species and is thus taxonomically useful. The dark peritoneal spots reported by various authors (i.e. Anderson et al., 1966; Gibbs, 1959; Gopinath, 1946; Norman, 1935) in postlarvae persist in adults. These spots, no longer visible externally in adults, can be easily seen on the peritoneal wall by cutting open the abdomen. They generally occur from the anteriormost portion of the peritoneum to slightly posterior of the origin of the anal fin. The number of spots is useful in separating juveniles of synodontid species, and this is true for adults as well. A more comprehensive discussion of these characters will be included in the forthcoming paper by Cressey.

Vertebral counts include the urostylar vertebra. Length of snout measurements are from tip to anterior margin of fleshy orbit. Diameter of orbit pertains to fleshy orbit (measured anterior-posterior).

The halftone illustration was done by Penelope Kay Hollingsworth.

Synodus capricornis, new species

Figs. 1-3

Synodus sp. Randall, 1970, p. 57 (Easter Island).

Holotype.—BPBM 6560, 131.3 mm SL, Easter Island, off Ahu Akapu, coral and sand bottom, 21 m, rotenone, J. E. Randall and B. A. Baker, 3 February 1969.

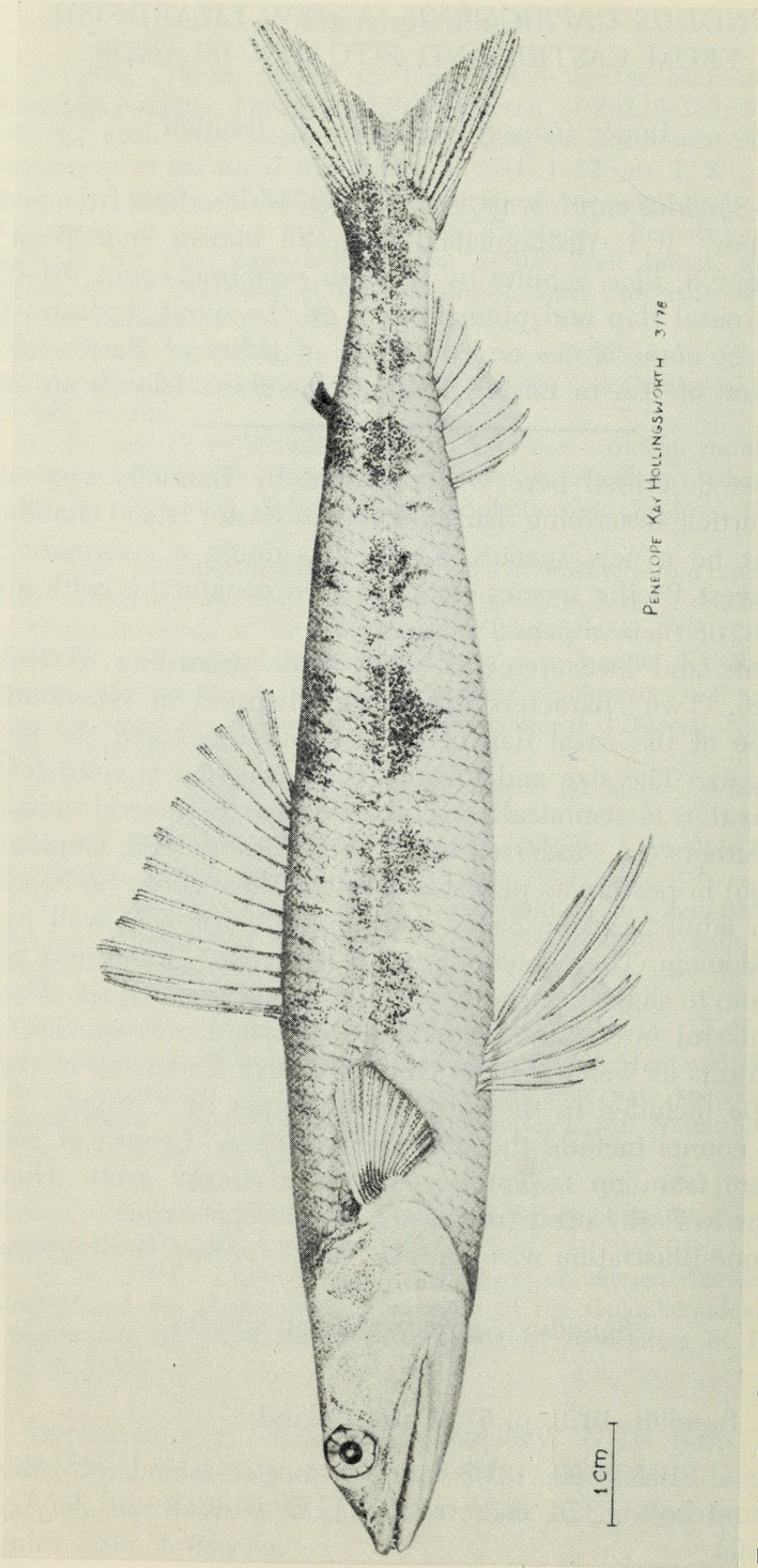


Fig. 1. *Synodus capricornis*, BPBM 6560, holotype, female, 131.3 mm SL, Easter Island (drawn from preserved specimen).

Paratypes.—BPBM 6562, 185.4 mm SL, Easter Island, off Motu Tautara, 38 m, rotenone, J. E. Randall and B. A. Baker, 12 February 1969; USNM 218461 167.8 mm SL, same data as preceding; BPBM 16860, 2; 74.2–92.7 mm SL, Pitcairn Island, off Bounty Bay, reef at edge of sand, 31–40 m, rotenone, J. E. Randall, D. B. Cannoy, and J. D. Bryant, 26 December 1970; USNM 218462, 99.6 mm SL, same data as preceding.

Description.—Holotype counts in parentheses. Small roman numerals refer to unbranched rays; arabic numerals to branched rays. Vertebrae 64–65 (65); dorsal-fin rays ii, 10–ii, 12 (ii,12); anal-fin rays vii, 1–ix,1 (ix,1); pectoral-fin rays ii,12; pelvic-fin rays i,7; branchiostegal rays 13; caudal-fin rays 19; procurent caudal-fin rays 32–33 (32) 16–18 (16) dorsal, 15–16 (16) ventral; peritoneal spots 10–12 (11); lateral-line scales 64–65 (65); scales above lateral line 5.5–6.5 (6.5); scales below lateral line 7.5; predorsal scales 15; cheek with 5 rows of scales, covering anterior $\frac{2}{3}$ of cheek; adipose eyelid narrow; interorbital space concave; eye midway between snout and angle of upper jaw; no keel on peduncle; upper jaw with single row of teeth, 2 v-shaped palatine bands each with 3 rows of teeth, inner row teeth longest; lower jaw with band of teeth of approximately 3 rows, teeth of inner row longest; tip of lower jaw with 2 incisorlike teeth within band of teeth, separated from posterior longest teeth by a gap filled with short teeth; lingual teeth well developed, backwardly directed on free end of tongue; nasal flap produced as a short tube with posterior margin forming a short triangular process; snout with 2 dark spots at tip; a series of 7–8 saddlelike dark bars, first bar anterior to origin of dorsal fin lighter than second bar at origin of dorsal fin, bars alternate lighter-darker caudally; paler below lateral line (dorsal bands may extend below lateral line); peritoneum pale except for dark spots; posterior pelvic process wide.

Color of holotype when fresh from an Ektachrome transparency (reproduced herein in black and white as Fig. 2): upper half of body greenish gray dorsally shading to orange-yellow on side, with a series of hourglass-shaped dark brown bars containing central areas of ground color; a row of dark brown blotches, one per pale interspace, just above lateral line and a second row of less distinct dark blotches above this; lower half of body whitish shading ventrally to pale salmon, with 15 narrow light orange-yellow bars, the upper part of each with some dark brown pigment; head mottled dark brown, greenish gray and orange-yellow dorsally, whitish with faint orange-yellow streaks ventrally; dorsal fin with pale membranes, the rays brown basally, light orangish distally, with two narrow whitish zones on lower half except rays 2–5 which have three and the last two rays which have one; caudal fin brown basally, the rest of the fin with pale membranes and orangish rays except some dark brown pigment on lobes and two converging whitish blotches in basal central part of fin; anal fin pale, the first few rays faintly orange-yellow; pectoral fins pale with a brown

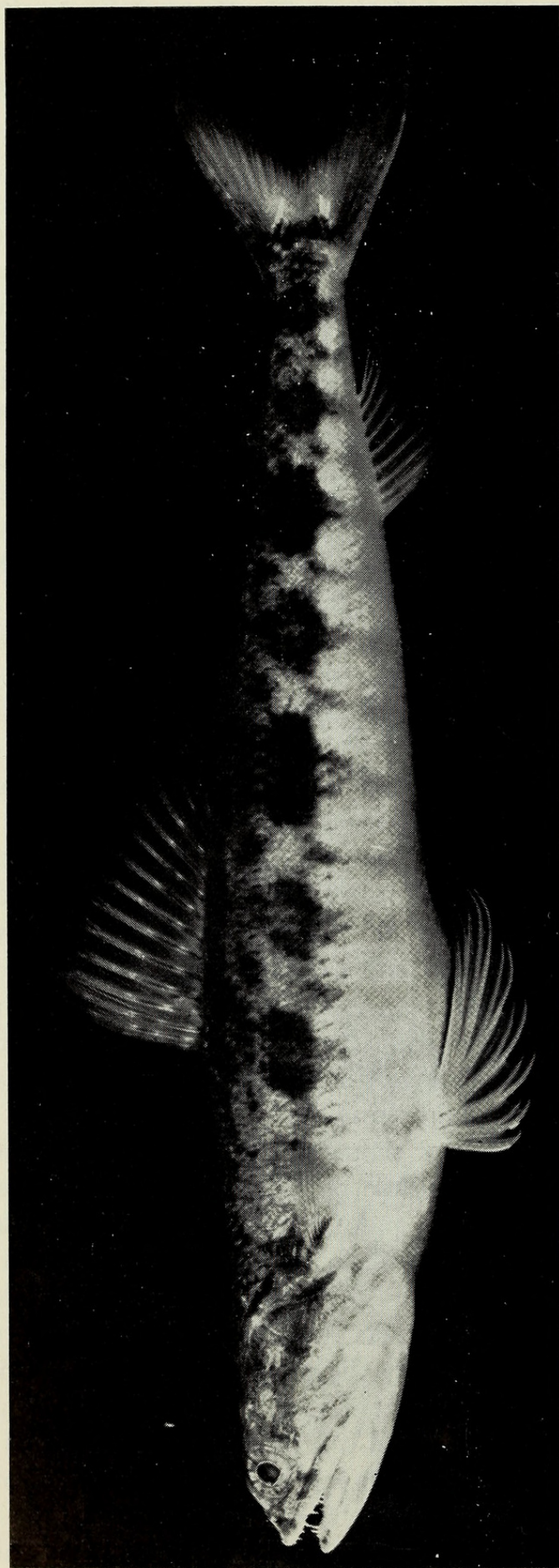


Fig. 2. *Synodus capricornis*, BPBM 6560, holotype, female, 131.3 mm SL, Easter Island (fresh specimen, photo by J. E. Randall).

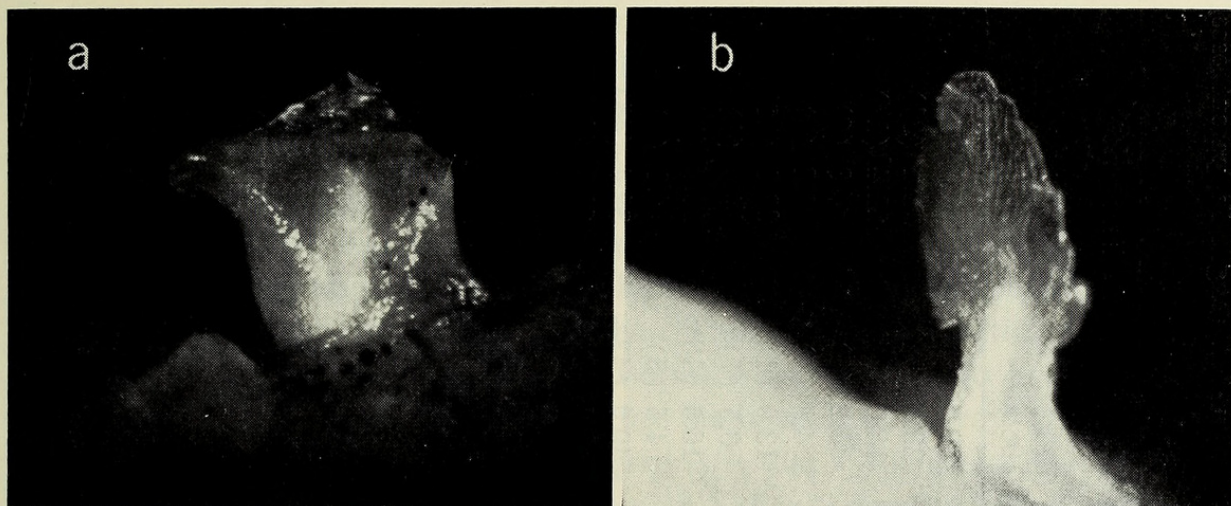


Fig. 3. Nasal flaps of *Synodus capricornis* and *S. ulae*. a. *S. capricornis*, USNM 218462, paratype, male, 99.6 mm SL, Pitcairn Island. b. *S. ulae*, ANSP 97832, male, 156 mm SL, Honolulu, Hawaii (photos by R. F. Cressey).

streak at base; pelvic fins with pale membranes, the rays white mixed with orange-yellow.

Morphometric data are presented in Table 1.

Etymology.—The name *capricornis* refers to the locality of the type material near the Tropic of Capricorn.

Remarks.—The high vertebral count distinguishes this species from all other known Indo-West Pacific *Synodus* except *S. ulae* Schultz from which it can be easily separated by the nasal flap. The nasal flap of *S. ulae* is produced as a large spatulate process (Fig. 3b), whereas in *S. capricornis* the flap is reduced to a short tube with the posterior margin produced as a short triangular process (Fig. 3a). It can be further separated from *S. ulae* as the new species typically has 2 dark spots at the tip of the snout (*S. ulae* often with some dark pigment on the snout but not in the form of discrete spots). The new species is similar to *S. ulae* in other meristic characters as well (dorsal and anal-fin ray and peritoneal spot counts). *Synodus ulae* is so far known only from Japan and Hawaii in the northern hemisphere, with the new species perhaps its counterpart in the southern hemisphere. Both species are on the periphery of Indo-West Pacific *Synodus* distribution.

The depth of capture data indicate that this species prefers depths of 70–130 ft.

The second author, Gerald R. Allen, and Bruce A. Baker collected fishes in Easter Island for a month in early 1969, resulting in the first specimens of *Synodus capricornis*. They brought the total number of species known from the island to 109 (Randall, 1970). A preliminary estimate of the level of endemism for fishes was given as 40%. It was predicted, however, that collections at the islands of the Pitcairn Group and Rapa to the

Table 1. Morphometric data for type specimens of *Synodus capricornis* new species (percent standard length in parentheses, measurements in mm).

Character	Paratype ♀ BPBM 6562	Paratype ♀ USNM 218461	Holotype ♀ BPBM 6560	Paratype ♂ USNM 218462	Paratype ♂ BPBM 16860	Paratype ♀ BPBM 16860
Standard length	185.4	167.8	131.3	99.6	92.7	74.2
Head length	51.5 (28)	47.4 (28)	36.9 (28)	31.8 (32)	28.0 (30)	23.1 (31)
Greatest depth	27.2 (15)	27.4 (16)	21.8 (16)	13.3 (13)	13.2 (14)	11.4 (15)
Least depth-caudal peduncle	11.2 (6)	10.7 (6)	7.6 (6)	5.8 (6)	5.2 (6)	4.3 (6)
Fleshy interorbital space	11.2 (6)	10.2 (6)	7.5 (6)	5.3 (5)	4.8 (5)	3.8 (5)
Body width	28.6 (15)	26.1 (16)	19.3 (15)	14.0 (14)	13.0 (14)	9.6 (13)
Length of snout	12.7 (7)	10.9 (6)	7.7 (6)	6.6 (7)	6.5 (7)	4.3 (6)
Length of upper jaw	32.3 (17)	28.2 (17)	21.8 (17)	18.7 (19)	16.5 (18)	13.4 (18)
Diameter of orbit	7.1 (4)	6.9 (4)	6.0 (4)	5.5 (5)	4.5 (5)	4.0 (5)
Snout to dorsal origin	77.4 (42)	68.7 (41)	53.9 (41)	43.0 (43)	40.0 (43)	32.4 (44)
Snout to adipose origin	160.7 (87)	144.2 (86)	114.8 (87)	86.4 (87)	79.6 (86)	63.0 (85)
Snout to anal origin	153.0 (83)	138.2 (82)	109.3 (83)	81.1 (81)	77.1 (83)	60.6 (82)
Snout to pectoral insertion	50.3 (27)	44.0 (26)	33.6 (26)	29.7 (30)	28.2 (30)	22.6 (30)
Snout to pelvic insertion	64.5 (35)	58.0 (35)	44.7 (34)	36.7 (37)	34.5 (37)	27.2 (37)
Snout to anus	148.1 (80)	135.7 (81)	105.3 (80)	80.3 (81)	74.0 (80)	57.6 (78)
Pelvic origin to anus	87.2 (47)	79.3 (47)	58.7 (45)	43.5 (44)	41.5 (45)	31.9 (43)
Length of pectoral fin	18.0 (10)	15.9 (10)	10.8 (8)	8.9 (9)	9.2 (10)	7.5 (10)
Length of pelvic fin	37.4 (20)	35.6 (21)	27.1 (21)	23.6 (24)	20.7 (22)	16.6 (22)
Length of caudal fin	31.6 (17)	25.8 (15)	20.3 (16)	15.3 (15)	13.9 (15)	11.1 (15)
Height of adipose fin	4.9 (3)	4.6 (3)	3.9 (3)	3.0 (3)	2.4 (3)	2.3 (3)
Dorsal-fin base	29.1 (16)	27.9 (17)	21.9 (17)	16.4 (17)	15.6 (17)	11.1 (15)
Anal-fin base	15.8 (9)	13.7 (8)	12.5 (10)	8.7 (9)	6.5 (7)	6.0 (8)
Length of 1st dorsal ray	16.7 (9)	14.6 (9)	11.5 (9)	8.5 (9)	8.3 (9)	7.4 (9)
Length of longest dorsal ray	24.0 (13)	21.1 (13)	17.5 (13)	12.5 (13)	13.0 (14)	10.8 (15)
Length of longest anal ray	15.0 (8)	14.5 (9)	9.0 (7)	damaged	7.0 (8)	5.0 (7)

west (at approximately the same latitude) would reveal the presence of some of the Easter Island "endemics." This proved to be true (Randall, 1973, 1974), and *S. capricornis* was among those species whose distribution was extended. Still other Easter fishes range even farther to the west in the southern subtropical zone. A recalculation of the level of endemism of fishes at Easter Island, as a result of extralimital collections and analyses, has produced the figure of 27.3% (Randall, 1976). This, however, is still tentative pending the further study. Thus the distribution pattern of Easter Island-Pitcairn (or Easter to Rapa) is not unique to *Synodus capricornis*. It is shared by other species such as the moray *Gymnothorax nasuta* De Buen, the soldierfish *Myripristis tiki* Greenfield, the hawkfish *Amblycirrhitis wilhelmi* (Lavenberg and Yañez) (generic classification uncertain), an undescribed morwong (*Goniistius*), the wrasse *Pseudolabrus fuentesi* (Regan), and the angelfish *Centropyge hotumatua* Randall and Caldwell.

One interesting observation was made by Randall (1970:57) on the predatory behavior of *Synodus capricornis* at Easter Island. After commenting that lizardfishes, in general, are voracious predators which usually dart upward from a resting position on the bottom to seize small fishes he wrote, "I was surprised, therefore, to see one of the Easter Island lizardfish slowly swim upward from the bottom at a depth of forty feet nearly halfway to the surface. But I noted that he was rising to the level of a small dense school of juvenile mackerel scads (*Decapterus*). He then rushed into the school, and as he emerged, I could see that he held one still struggling scad sideways in his jaws. It seemed nearly as large as the lizardfish, and I have since wondered if he ever managed to swallow it."

Acknowledgments

We thank Dr. Robert Gibbs for critically reviewing the manuscript and making a number of helpful suggestions. The halftone illustration was done by Penelope Kay Hollingsworth.

Literature Cited

- Anderson, W. W., J. W. Gehringer, and F. W. Berry. 1966. Family Synodontidae. Fishes of the Western North Atlantic. Sears Found. Mar. Res. Mem. 1(5):30-102.
- Hubbs, C. L., and K. F. Lagler. 1958. Fishes of the Great Lakes Region, rev. ed. Cranbrook Inst. Sci. Bull. 26:1-213.
- Gibbs, R. H., Jr. 1959. A synopsis of the postlarvae of Western Atlantic Lizardfishes (Synodontidae). Copeia 3:232-236.
- Gopinath, K. 1946. Notes on the larval and post-larval stages of fishes found along the Trivandrum coast. Proc. Nat. Inst. Sci. India 12(1):7-21.
- Norman, J. R. 1935. A revision of the Lizard-fishes of the Genera *Synodus*, *Trachinocephalus*, and *Saurida*. Proc. Zool. Soc. London (1):99-135.
- Randall, J. E. 1970. Easter Island. Oceans 3(3):48-59.

- . 1973. Expedition to Pitcairn. *Oceans* 6(2):12-21.
- . 1974. Rapa and beyond. *Oceans* 7(6):24-31.
- . 1976. The endemic shore fishes of the Hawaiian Islands, Lord Howe Island and Easter Island. *Colloq. Commerson 1973, O.R.S.T.O.M. Trav. Doc.* 47: 49-73.

(RC) Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560; and (JER) Bernice P. Bishop Museum, Honolulu, Hawaii 96818.



Cressey, Roger F. and Randall, John E. 1978. "Synodus capricornis, a new lizardfish from Easter and Pitcairn Islands." *Proceedings of the Biological Society of Washington* 91, 767–774.

View This Item Online: <https://www.biodiversitylibrary.org/item/107593>

Permalink: <https://www.biodiversitylibrary.org/partpdf/45701>

Holding Institution

Smithsonian Libraries and Archives

Sponsored by

Biodiversity Heritage Library

Copyright & Reuse

Copyright Status: In copyright. Digitized with the permission of the rights holder.

Rights Holder: Biological Society of Washington

License: <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Rights: <https://biodiversitylibrary.org/permissions>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.