

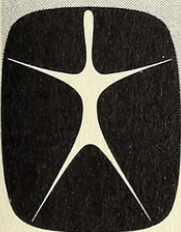
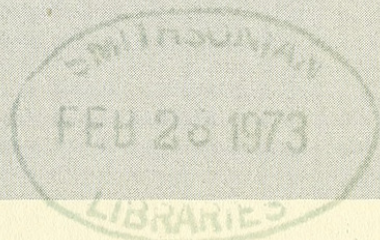
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A NEW BUTTERFLYFISH OF THE GENUS *CHAETODON* AND
A NEW ANGELFISH OF THE GENUS *CENTROPYGE*
FROM EASTER ISLAND

By JOHN E. RANDALL AND DAVID K. CALDWELL

CONTRIBUTIONS IN SCIENCE



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A NEW BUTTERFLYFISH OF THE GENUS *CHAETODON* AND A NEW ANGELFISH OF THE GENUS *CENTROPYGE* FROM EASTER ISLAND¹

By JOHN E. RANDALL² AND DAVID K. CALDWELL³

ABSTRACT: The chaetodontid fish *Chaetodon litus* Randall and Caldwell is described from Easter Island, the only known locality. It is brown with no dark markings; the dorsal and anal fins are narrowly edged with white except the spinous portion of the anal which is almost entirely white; the caudal is pale posteriorly. The pomacanthid *Centropyge hotumatua* Randall and Caldwell is also described from Easter Island. It is brown, with the head, nape, abdomen, and caudal peduncle orange-yellow; a black spot appears posteriorly on the opercle and a blue ring nearly encircles the eye; a blue margin is visible on the soft portion of the anal fin, with blue markings posteriorly in the dorsal and anal fins. This species was collected subsequently in the Pitcairn Group, Rapa, and the Austral Islands.

In his "Los Peces de la Isla de Pascua," de Buen (1963) listed the 40 species of fishes known from Easter Island at that time. Among them was one species of butterflyfish, *Forcipiger longirostris*, now recognized as *F. flavissimus* Jordan and McGregor (Randall and Caldwell, 1970). No angelfishes were listed.

Three large collections of fishes made in recent years at Easter Island have increased the number of species of fishes known from the island to 107. The first was a single large rotenone station made inshore at Anakena Cove by Ramsey Parks and the crew of the yacht "Chiriqui" on October 1, 1958. This collection was held at UCLA in the care of Boyd W. Walker until 1960 and was then transferred to the Natural History Museum of Los Angeles County (LACM). Extensive collections were made during the Canadian Medical Expedition to Easter Island in 1964 and 1965 by Ian E. Efford, Jack A. Mathias and associates. These fishes are deposited mainly at the University of British Columbia (BC). The third collection was made by Randall, Gerald R. Allen, and Bruce A. Baker in January and February, 1969, with support of a grant from the National Geographic Society. Except for certain types, these specimens are at the Bernice P. Bishop Museum (BPBM), Honolulu. Thanks are due Robert J. Lavenberg and Norman J. Wilimovsky for the loan of LACM and BC specimens, respectively, and for field data.

These collections contained additional specimens of *Forcipiger flavissi-*

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mus. They also included specimens of a new chaetodontid fish of the genus *Chaetodon* and a new pomacanthid fish of the genus *Centropyge* which are the subject of the present paper. We are also grateful to Dr. Herbert R. Axelrod of TFH Publications for the color plate of the two new species of fishes.

In addition to the Bishop Museum, Natural History Museum of Los Angeles County, and the University of British Columbia, paratypes have been deposited at the British Museum (Natural History) [BM(NH)], California Academy of Sciences (CAS), Museum National d'Histoire Naturelle (MNHN), and the National Museum of Natural History (USNM).

***Chaetodon litus* Randall and Caldwell, new species**

Figures 1, 2, Table 1

Holotype: BPBM 6659, 96.5 mm standard length (SL), female, Easter Island, Anakena Cove, 6-10 ft., Chemfish, J. E. Randall and G. R. Allen, January 31, 1969.

Paratypes: LACM 6560-1, 19(85-118.5 mm SL), Easter Island, Anakena Cove, east side, 100 yd. NE of sand beach, boulder bottom with brown algae (75%) and *Lithothamnium* (15%) cover, 0-15 ft., water temperature 69° F, rotenone, R. Parks and crew of the ketch "Chiriqui," January 1, 1958; BC 65-403, 1(107.5 mm SL), Easter Island, Hanga Roa, rocky pool, 3-5 m, rotenone and spear, I. E. Efford and J. A. Mathias, December 23, 1964; BC 65-407, 1(112 mm SL), Easter Island, 200 m N of Hanga Roa, I. E. Efford and J. A. Mathias, December 23-24, 1964; BC 65-429, 2(107-108 mm SL), Easter Island, Rano Raraku on south coast, rotenone, I. E. Efford and J. A. Mathias, January 8, 1965; BC 65-430, 2(100.5-107 mm SL), Easter Island, Rano Raraku area, 3-8 m, rotenone and spear, I. E. Efford and J. A. Mathias, January 8, 1965; BC 65-434, 1(93 mm SL), Easter Island, 200 m N of Hanga Roa, I. E. Efford and J. A. Mathias, January 13, 1965; BC 65-440, 2(44.5-96 mm SL), Anakena Cove, tide pools, 0.5-8 m, rotenone, I. E. Efford and J. A. Mathias, January 15, 1965; BC 65-446, 2(110-122.5 mm SL), Anakena Cove, 7-8 m, rotenone, I. E. Efford and J. A. Mathias, January 16, 1965; BC 65-451, 1(93.5 mm SL), Easter Island, off Hanga Roa, 1-5 m, rotenone, I. E. Efford and J. A. Mathias, February 2, 1965; BC 65-455, 2(39.5-40 mm SL), Easter Island, Hanga Roa, subtidal, rotenone, I. E. Efford and J. A. Mathias, February 5, 1965; BC 65-457, 1(110.5 mm SL), Easter Island, Hanga Roa, subtidal, rotenone, I. E. Efford and J. A. Mathias, February 5 or 6, 1965; BC 65-458, 2(42-111 mm SL), Easter Island, Hanga Roa, rotenone, I. E. Efford and J. A. Mathias, February 6, 1965; BPBM 6655, 2(99-107 mm SL), Easter Island, Hanga Piko boat channel, 6 ft., spear, G. R. Allen, January 18, 1969; BPBM 6660, 1(107 mm SL), Easter Island, Hanga Piko boat channel, 10 ft., spear, J. E. Randall, January 20, 1969; BPBM 6662, 4(36-40 mm SL), Easter Island, tide pools between Hanga Roa and Hanga Piko, 1-3 ft., J. E. Randall and G. R. Allen, January 25, 1969; BPBM 10438, 1(87 mm SL), same data as holotype; USNM 208218, 1(100.5 mm SL), same data as holotype; BPBM 6661, 2(40-115 mm SL), Easter Island, wreck between Hanga Roa and Hanga Piko, 15 ft., spear and Chemfish, J. E. Randall and B. A. Baker, January 27, 1969; BPBM 6658, 1(107 mm SL), Easter Island, Mataverí O Tai, 25 ft., Chemfish and spear, J. E. Randall and G. R. Allen, February 2, 1969; BPBM 6663, 1(39.8 mm SL), Easter Island, off Ahu Akapu on west coast, 70 ft., Chemfish, J. E. Randall and B. A. Baker, February 3, 1969; BM (NH) 1972.10.5.2, 1(41.7 mm SL), same data as preceding; BPBM 6657, 1(113 mm SL), Easter Island, off Ahu Akapu, 80 ft., Chemfish, J. E. Randall and

G. R. Allen, February 5, 1969; BPBM 6664, 1(39 mm SL), Easter Island, tide pools between Hanga Roa and Hanga Piko, 1-3 ft., Chemfish, J. E. Randall and G. R. Allen, February 6, 1969; BPBM 6656, 1(97.2 mm SL), Easter Island, off Motu Tautara, 60 ft., Chemfish, J. E. Randall and G. R. Allen, February 7, 1969.

Diagnosis: A *Chaetodon*, as defined by Ahl (1923), with dorsal rays XIII (rarely XIV), 22 to 25; anal rays III, 18 to 21; pectoral rays 15 or 16; lateral-line scales 37 to 43; snout slightly produced, its length 2.6 to 2.8 in head; body depth 1.6 to 1.8 in SL; brown, the centers of the scales paler than edges, with no black markings on head or body; margins of dorsal and anal fins white, the spinous portion of the anal almost completely white; a crescentic hyaline zone posteriorly in caudal fin.

Description (counts in parentheses apply to 39 paratypes unless otherwise specified): Dorsal rays XIII, 25 (22 to 25, except two XIV, 23, modally 23 or 24); anal rays III, 20 (18 to 21, modally 19, one with 18 and one with 21);

TABLE 1
Proportional Measurements of Type Specimens of
Chaetodon litus expressed as Thousandths of SL.

	HOLOTYPE		PARATYPES		
	BPBM 6659	USNM 208218	BPBM 6656	BPBM 10438	BPBM 6663
Standard length (mm)	96.5	100.5	97.2	87.0	39.8
Greatest depth of body	593	616	592	610	553
Width of body at gill opening	145	151	139	147	153
Head length	297	290	305	301	354
Snout length	110	110	117	109	125
Diameter of eye	85	88	89	95	119
Postorbital length of head	132	123	130	126	134
Bony interorbital width	90	90	92	95	113
Length of upper jaw	75	75	74	71	93
Least depth of caudal peduncle	102	96	100	103	113
Length of caudal peduncle	50	50	56	45	42
Snout to original of dorsal fin	383	375	380	379	410
Snout to origin of pelvic fins	409	403	423	407	459
Length of caudal fin	197	204	203	230	248
Length of pectoral fins	255	274	267	276	280
Length of pelvic fins	279	280	276	284	352
Length of pelvic spine	197	224	211	225	276
Length of dorsal fin base	806	807	772	815	691
Length of first dorsal spine	69	89	80	85	131
Length of second dorsal spine	135	139	164	172	280
Length of third dorsal spine	180	177	200	203	321
Length of last dorsal spine	181	174	189	202	228
Length of longest dorsal soft ray	196	209	207	237	227
Length of anal fin base	383	384	364	402	370
Length of first anal spine	109	101	121	124	155
Length of 2nd anal spine	238	246	220	230	250
Length of third anal spine	228	263	231	233	253
Length of longest anal soft ray	209	204	210	230	248

pectoral rays 16 (15 or 16, modally 15, except one abnormal specimen with 12 and another with 13 rays on one side; normally upper two and lower-most unbranched); pelvic rays 1,5; principal caudal rays 17 (15 branched); pored lateral-line scales 37 to 43 (modally 39 and 40); vertical scale rows from upper end of gill opening to caudal base about 50; scales above lateral line to origin of dorsal fin 13; scales below lateral line to origin of anal fin 26; circum-peduncular scales 27; gill rakers 18 (4 specimens) branchiostegal rays 6; vertebrae 24 (34 specimens).

Body deep, the maximum depth 1.6 to 1.8 in SL, and compressed, the width behind gill opening 3.6 to 4.3 in depth; head (measured from front of upper lip to end of opercular membrane) 2.8 to 3.5 in SL (head relatively long in juveniles); snout slightly produced, its length to front of upper lip 2.6 to 2.8 in head; interorbital space convex, the bony width 3.1 to 3.3 in head; caudal peduncle deeper than long, the least depth 2.9 to 3.15 in head, the length (measured horizontally from rear base of anal fin to caudal base) 2.3 to 2.55 in least depth.

Mouth small, oblique, the lower jaw projecting; maxillary reaching a vertical below nostrils.

Teeth very close-set, slender, and elongate (the length about one-fifth eye diameter in adults), in six rows at front of upper jaw and nine at front of lower.

A small bony prominence at front of snout aligned with anterior and posterior nostrils, distance separating these knobs contained about four times in eye diameter of adults. A slight, fleshy prominence at corner of mouth below posterior end of maxillary.

Anterior and posterior nostrils separated by a distance about equal to opening of anterior nostril; a well-developed fleshy rim on anterior nostril, broadening to a slight flap dorsoposteriorly; posterior nostril slightly elongate horizontally, with a low fleshy rim anteriorly.

Margins of opercular bones smooth except for a few small serrae or crenulations on the broadly rounded angle of the preopercle.

Scales finely ctenoid. Head completely scaled except for a narrow region at front of snout including the pair of bony prominences mentioned above; scales on head and thorax notably smaller than on body, those on opercle in about 8 or 9 irregular near-vertical rows (as counted near ventral edge). Small scales reaching nearly to margins of dorsal and anal fins except anterior spinous portions; scales on caudal fin extending about two-thirds to three-fourths the distance to posterior margin; paired fins scaled only basally.

Lateral line following curved contour of back, ending beneath base of about third-from-last dorsal ray.

Origin of dorsal fin above upper edge of preopercular margin; first dorsal spine about half length of second, the second spine about 1.2 to 1.3 in third (of adults); fifth and sixth dorsal spines the longest, about 1.4 in head; last dorsal spine very slightly shorter than third. Longest dorsal soft ray (about the tenth) approximately equal to longest dorsal spine. Interspinous membranes of anterior portion of dorsal fin deeply incised.

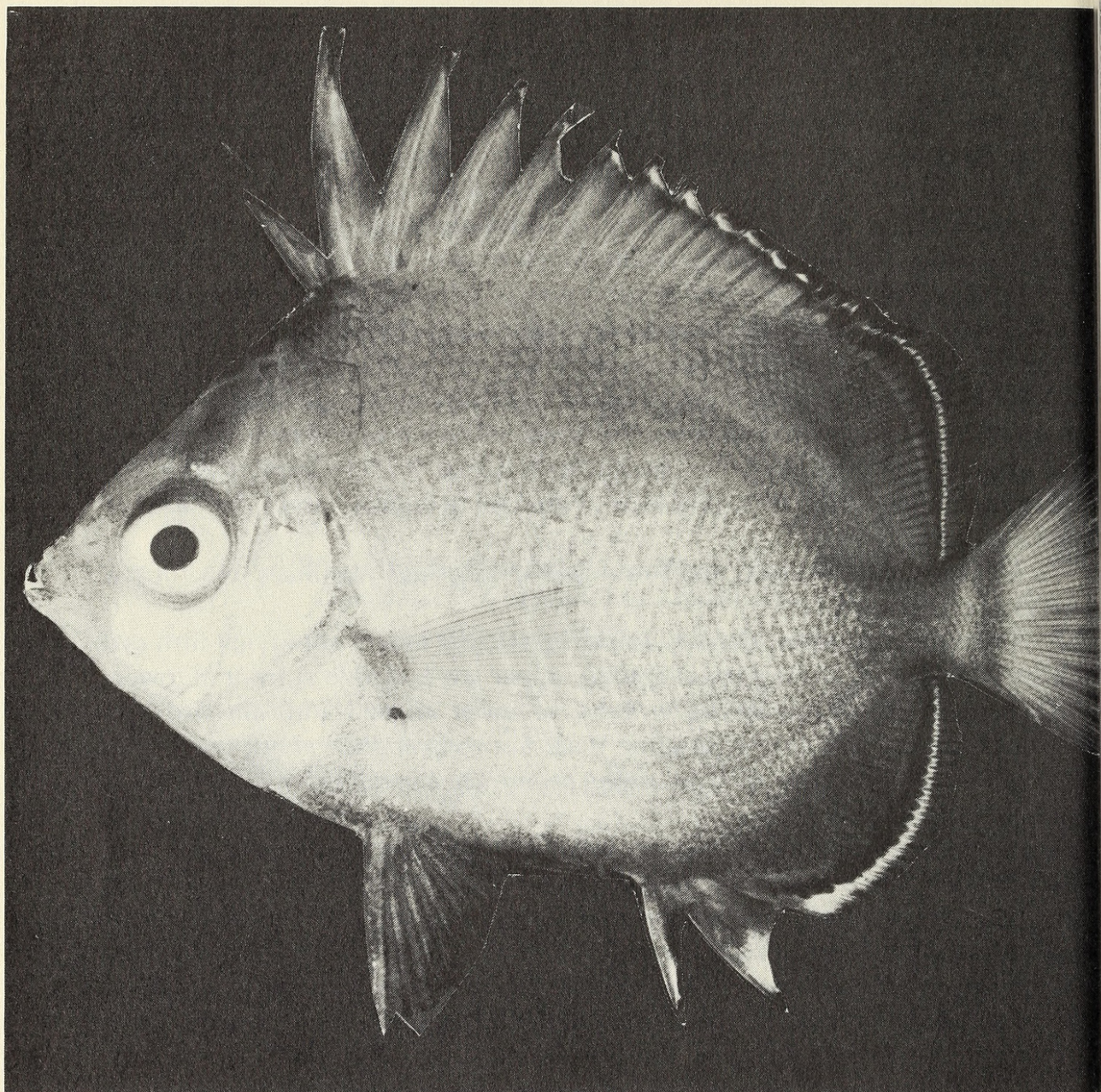


FIGURE 1. Juvenile of *Chaetodon litus* Randall and Caldwell, paratype, BPBM 6662, 36 mm SL, Easter Island.

Anal spines notably longer and stouter than first three dorsal spines, first about equal to snout length, second about twice as long as first, and third subequal to second. Longest anal soft ray (about the sixth) slightly shorter than second and third anal spines.

Caudal fin varying from slightly rounded to slightly emarginate, its length 1.3 to 1.5 in head.

Pectoral fins somewhat pointed, slightly shorter than head (1.05 to 1.25 in head length), not reaching as far posteriorly as pelvic fins. Origin of pelvic fins posterior to base of pectorals; filamentous tip of first pelvic ray reaching to or beyond anus; pelvic spine 1.2 to 1.5 in head.

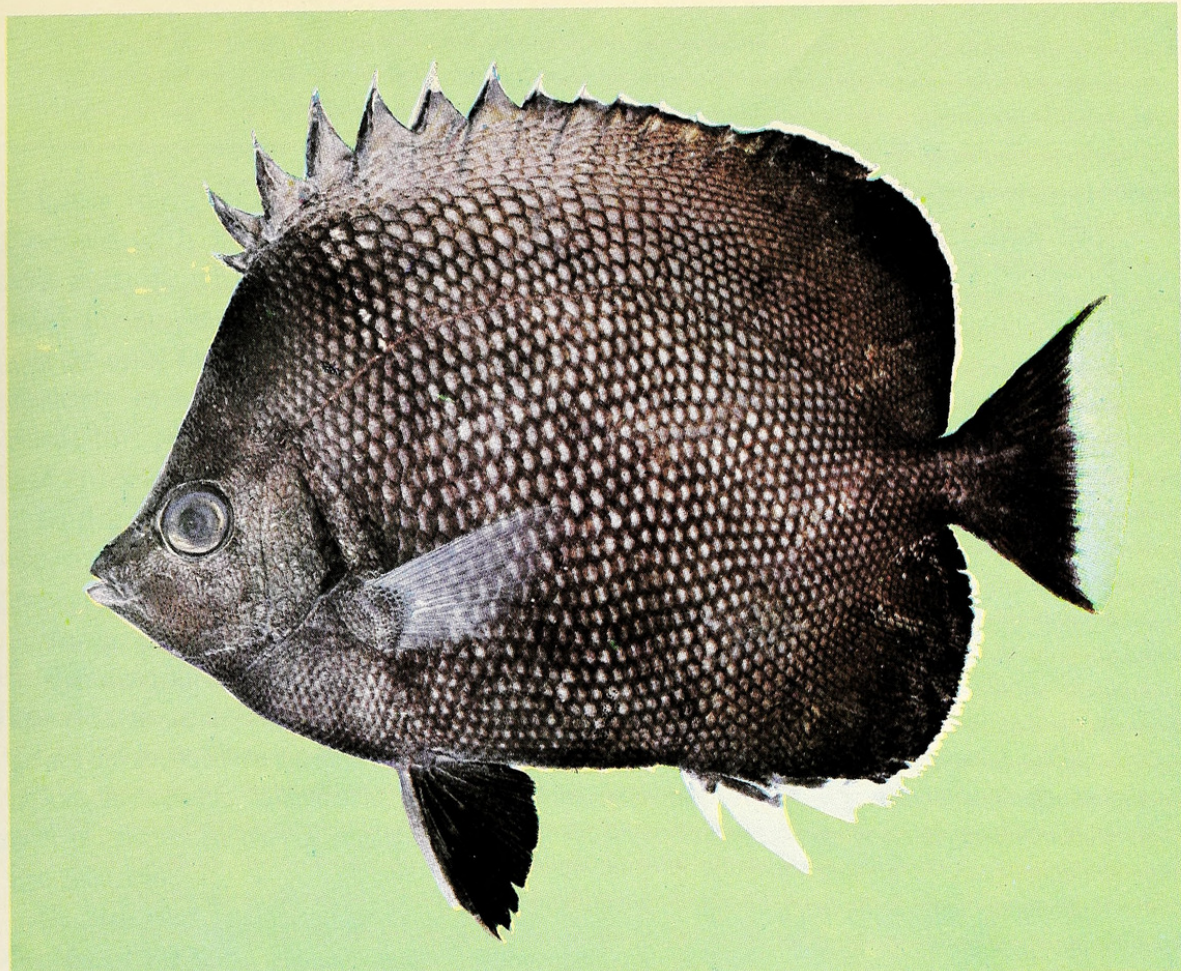


Fig. 2. *Chaetodon litus* Randall and Caldwell, holotype, BPBM 6659, 96.5 mm standard length, Easter Island.



Fig. 3. *Centropyge hotumatua* Randall and Caldwell, holotype, BPBM 6665, 67.6 mm standard length, Easter Island.

Color in alcohol brown, centers of scales paler than edges; dorsal and anal fins brown with a narrow whitish margin except spinous portion of anal fin almost entirely whitish; dorsal fin with a dark brown submarginal line (brown of anal fin slightly darker than dorsal fin and submarginal dark brown not visible or only faintly discernible); caudal fin brown with a pale crescentic area posteriorly in fin (nearly one-third length of fin in broadest central portion); pectoral fins pale, except scaled basal portion brown; pelvic fins dark brown, except spine pale.

In life this fish is colored almost the same as in preservative; the contrast between the darker brown edges of the scales of the body and the paler centers is greater, and the white edges of the dorsal and anal fins are more vivid in life.

Remarks: The closest relative of *Chaetodon litus* is an undescribed species from Pitcairn and Rapa which is black on its anterior half and abruptly bright yellow on the posterior half (Burgess and Randall, MS). Of the described species in *Chaetodon*, *C. litus* most resembles *C. daedalma* Jordan and Fowler (1902) in color; however, *daedalma* is clearly distinct in having 16 anal rays, short posterior spines in the dorsal fin, a more rounded caudal fin, and larger scales on the opercle.

C. litus was collected only at Easter Island; it was taken from the shallows to depths of 80 feet. The young were found in tidepools. Randall (1970) wrote that G. R. Allen once observed it picking at the bodies of other fishes, hence it appears to be a part-time cleaner, as reported for a few other species of *Chaetodon*.

Named *litus*, a greek adjective, meaning plain or simple, in reference to its plain color — very much in contrast to the striking color patterns of most butterflyfishes.

***Centropyge hotumatua* Randall and Caldwell, new species**

Figures 3, 4, Table 2

Holotype: BPBM 6665, 67.6 mm SL, male, Easter Island, offshore from Ahu Akapu on the western side, 70 ft., bottom mainly coral and coral rock with brown algae, Chemfish, J. E. Randall and B. A. Baker; February 3, 1969.

Paratypes: BPBM 10439, 1(64.0 mm SL), same data as holotype; MNHN 1970-116, 1(53.5 mm SL), off Ahu Akapu, 80 ft., Chemfish, J. E. Randall and G. R. Allen, February 5, 1969; USNM 205521, 1(64.8 mm SL), same data as preceding; CAS 13390, 1(45.2 mm SL), off Motu Tautara on west side of island, 125 ft., sand and rock bottom with ledges, Chemfish, J. E. Randall and B. A. Baker, February 12, 1969; BPBM 13314, 2(27.8–36.8 mm SL), Oeno, Pitcairn Group, north side of atoll, reef in 40-60 ft., rotenone, J. E. Randall and crew of the schooner "Westward," December 18, 1970; BPBM 13326, 2(22.6–27.5 mm SL), Pitcairn, off Down Rope on southeast side of island, reef in 90 to 100 ft., rotenone, J. E. Randall, D. B. Cannoy, and S. R. Christian, December 23, 1970; LACM 32817-1, 2(23.8–57.5 mm SL), Pitcairn, off Christian's Point, 40-60 ft., rotenone, J. E. Randall, D. B. Cannoy, and S. R. Christian, December 28, 1970; BM(NH) 1972.10.5.1, 2(23.0–51.0 mm SL),

same data as preceding; BPBM 13312, 5(24.9-61.8 mm SL), Pitcairn, off McCoy on south side of island, reef in 75-85 ft., rotenone, J. E. Randall, D. B. Cannoy, J. R. Haywood, J. D. Bryant, and S. R. Christian, January 4, 1971; BPBM 13315, 3(24.5-46.2 mm SL), Pitcairn, patch reef off Gannet Ridge on north side of island, 130-145 ft., rotenone, J. E. Randall, D. B. Cannoy, J. R. Haywood, R. R. Costello, J. D. Bryant, and C. R. Christian, January 6, 1971; BPBM 12275, 3(32.0-48.0 mm SL), Ducie, Pitcairn Group, off southwest side of atoll; reef in 100 ft., rotenone, J. E. Randall, D. B. Cannoy, R. R. Costello, S. R. Christian and R. N. McNair, January 15, 1971; BPBM 13012, 1(60.6 mm SL), Rapa, reef at entrance to Haurei Bay, 50 ft., spear, J. E. Randall, February 15, 1971; BPBM 12793, 1(33.0 mm SL), Raivavae, Austral Islands, outside barrier reef, south of Motu Haa, 120 ft., spear, D. B. Cannoy, February 25, 1971.

Diagnosis: A *Centropyge*, as defined by Fraser-Brunner (1933), with the head, thorax, abdomen, and caudal peduncle pale (yellow-orange in life) in contrast to the dark brown median portion of body, a black spot posteriorly on opercle associated with small blue markings, and a blue ring around all but anterior edge of eye.

Description (counts in parentheses apply to Easter Island paratypes): Dorsal rays XIV, 17 (one with 18) (last ray branched to base); anal rays III, 18 (last 2 rays close at base); pectoral rays 17 (one with 16) (upper 2 and lowermost unbranched); pelvic rays I, 5; branched caudal rays 15 (upper and lowermost unbranched rays of fin not reaching posterior margin); pored scales of lateral line 36 (34 to 37); vertical scale rows from upper end of gill opening to caudal base 45 (43 to 46); scales above lateral line to origin of dorsal fin 7 (one with 6); scales below lateral line to origin of anal fin 19 (18 to 20); circumpeduncular scales 20 (20 to 22); gill rakers 6 + 17 (one with 6 + 16) (raker at angle included in lower-limb count); branchiostegal rays 6; upper teeth 70 (62 to 68); lower teeth 68 (53 to 60).

Body deep, the maximum depth 1.8 to 1.9 in SL, and compressed, the width behind gill opening 2.6 to 3 in depth; head (measured from front of upper lip to end of opercular membrane) 3 to 3.35 in SL; snout 2.65 to 2.95 in head; eye 2.55 to 3.1 in head; interorbital space slightly convex, the bony width 3.2 to 3.65 in head; caudal peduncle deeper than long, the least depth 2.2 to 2.5 in head, the length (measured horizontally from rear base of anal fin to caudal base) 1.5 to 1.6 in least depth.

Mouth small, terminal, the gape horizontal; maxillary reaching slightly posterior to a vertical at anterior nostril; upper lip nearly as broad (vertically at front) as lower, the upper lip height almost half eye diameter.

Teeth slender and elongate, close-set, flexible, tricuspid (the central cusp notably longer and broader than the lateral ones), in about three well-spaced rows in jaws, the teeth of the outer row the largest; no teeth on roof of mouth; tongue short and broadly rounded.

Gill membranes narrowly attached to isthmus; 5 (1 to 3) fleshy papillae in mid-ventral line between chin and isthmus; anterior and posterior nostrils separated by a space about half diameter of posterior nostril; posterior nostril slightly larger than anterior, separated from eye by a space about equal to its

TABLE 2
Proportional Measurements of Type Specimens of
Centropyge hotumatua expressed as Thousandths of SL.

	HOLOTYPE		PARATYPES		
	BPBM 6665	BPBM 10439	USNM 205521	CAS 13390	MNHN 1970-116
Standard length (mm)	67.3	64.0	64.8	45.2	53.5
Greatest depth of body	557	532	542	538	555
Width of body behind gill opening	195	202	186	192	187
Head length	327	325	298	304	328
Snout length	118	122	111	109	111
Diameter of eye	106	108	102	118	117
Postorbital length of head	106	105	102	106	110
Bony interorbital width	91	89	93	94	90
Least depth of caudal peduncle	132	129	133	133	136
Length of caudal peduncle	82	86	85	88	—
Snout to origin of dorsal fin	405	405	381	388	384
Snout to origin of pelvic fins	375	378	367	380	360
Length of caudal fin	297	300	278	293	295
Length of pectoral fin	302	313	303	308	328
Length of pelvic fin	363	314	360	377	341
Length of pelvic spine	182	181	191	185	—
Length of dorsal fin base	712	680	701	700	—
Length of first dorsal spine	62.5	70	69	67	72
Length of second dorsal spine	89	109	107	112	116
Length of third dorsal spine	145	141	139	148	146
Length of last dorsal spine	201	200	201	208	188
Length of longest dorsal soft ray	221	219	218	204	216
Length of anal fin base	408	400	415	410	—
Length of first anal spine	113	125	136	111	114
Length of second anal spine	190	172	200	175	175
Length of third anal spine	231	228	234	225	215
Length of longest anal soft ray	263	259	255	265	247

diameter; anterior nostril with a membranous edge and an elevated posterior flap.

A stout spine at corner of preopercle, its length varying from about three-fourths eye diameter to full eye diameter; 12 (10 to 13) small spines along upper margin of preopercle and one nearly half as long as spine at angle on lower edge of preopercle, usually contiguous to spine at angle; 2 or 3 moderate spines on interopercle; a few small spines on subopercle; opercle with 2 broad flat spines, one near upper end of gill opening and the other at about the level of lower edge of eye; preorbital with 4 to 7 spines along ventral edge.

Scales coarsely ctenoid (up to 32 ctenii on margins), the exposed portion ridged; scales extending more than halfway to margin of dorsal and anal fins (nearly to margin in middle of fins); scales on basal third of caudal fin, with small scales extending out on rays for another third of length of fin; paired fins scaled only basally. Head almost completely scaled.

Lateral line steeply arched, ending at about base of fourth-from-last dorsal ray.

Origin of dorsal fin above upper end of gill opening; first dorsal spine about two-thirds length of second dorsal spine; second spine about three-fourths length of third spine; last four spines subequal, the last contained 1.45 to 1.7 times in head length; longest dorsal soft ray (about the eighth) 1.35 to 1.5 in head length; membranes of anterior portion of dorsal fin deeply incised, while those between posterior spines only slightly indented; a small cirrus projecting from membrane just posterior to tips of dorsal spines.

The three anal spines slightly longer than their dorsal counterparts, the third spine 1.25 to 1.5 in head length; longest anal soft ray (about the eighth) 1.15 to 1.3 in head length.

Caudal fin nearly as long as head, its posterior border varying from near-truncate with the lobes slightly produced, particularly the upper (holotype), to slightly rounded.

Pectoral fins slightly pointed, about equal to head length, reaching to level of origin of anal fin or slightly beyond. Origin of pelvic fins slightly posterior to base of pectorals; first soft ray of pelvic fins prolonged, reaching well beyond origin of anal fin (varying from base of second anal spine to base of second anal soft ray); pelvic spine about half length of pelvic fin.

Color in alcohol: body dark brown posterior to a line passing from origin of dorsal fin slightly posterior to pectoral base and thence to origin of anal fin; body anterior to this line, and head, pale; caudal peduncle pale (in the smallest paratype the dark brown zone is narrower, beginning at an approximate line from base of fifth dorsal spine to base of third anal spine and ending posterior to a line from base of ninth dorsal soft ray to base of twelfth anal soft ray); upper posterior portion of opercle and opercular membrane above lower opercular spine dark brown; some dark pigment on shoulder region at upper end of gill opening, largely covered by opercle; posterior two-thirds of eye with an irregular dark brown edge which is broadest posteriorly (about one-fifth eye diameter at its widest point), some pigment extending downward onto upper posterior part of eye; a small bilobed brown spot on preopercular margin on left side (more pigment on three of the paratypes at this location, particularly the smallest); centro-basal region of dorsal and anal fins, where covered with ciliated scales like the body, dark brown; rest of these fins brown, paler distally, with a trace of irregular horizontal banding distally, posterior to eleventh dorsal spine, and a large dark brown (almost black) spot on outer part area between 7th to 13th dorsal soft rays (within this large spot there are elongate blotches of denser pigmentation); some dark pigment on outer part of 14th and 15th soft dorsal rays; cirri at tips of dorsal spines and some of adjacent membranes blackish; caudal fin dusky, most of pigment on rays; paired fins pale; membraneous flap lying beneath and slightly above spine at corner of preopercle brownish.

In life the pale areas are bright orange-yellow, this color extending along

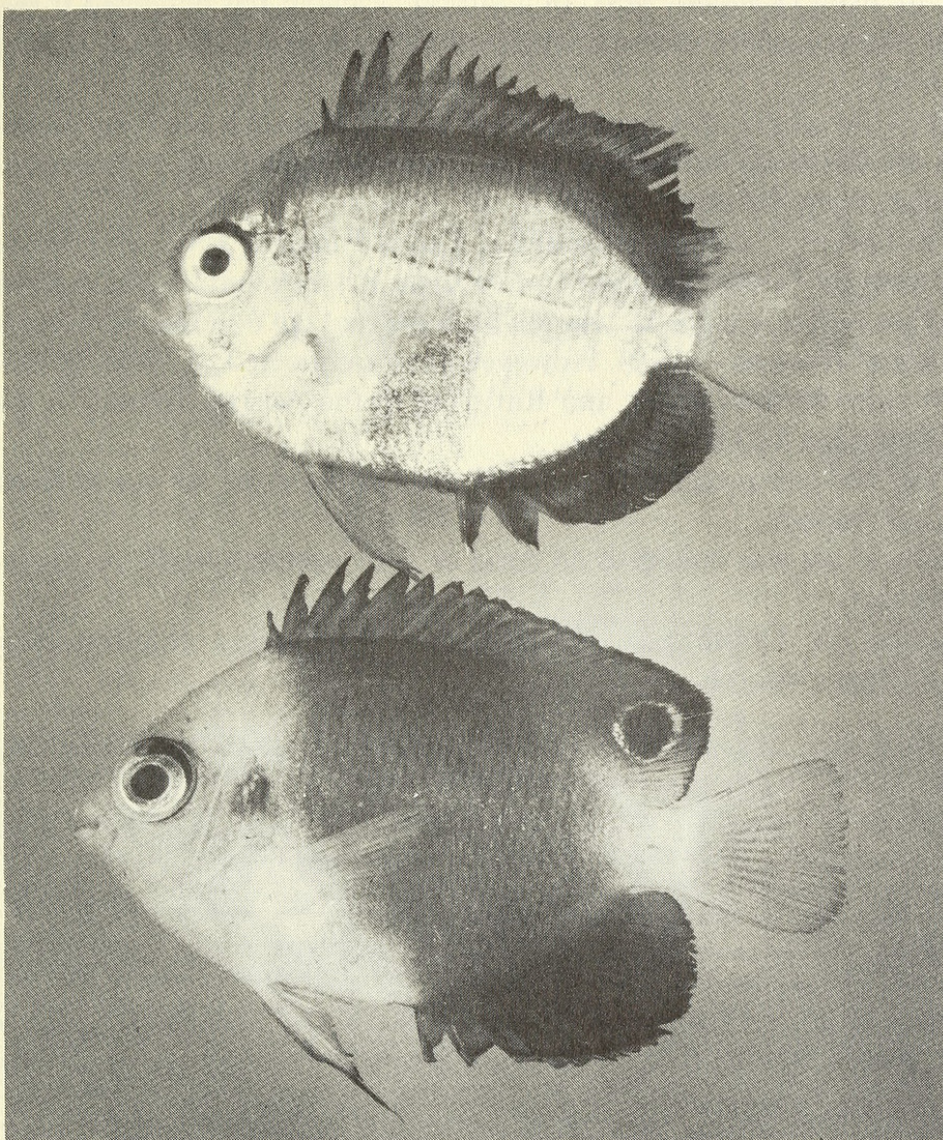


FIGURE 4. Transforming prejuvenile and juvenile of *Centropyge hotumatua* Randall and Caldwell, paratypes, BPBM 13326, 22.6 and 27.5 mm SL, Pitcairn.

anterior and outer part of dorsal and anal fins, where largely masked by brown, and onto upper and lower edges of caudal fin; rim of posterior two-thirds of orbit bright blue (a zone of black on upper part of eye below the blue edge); some blue markings around black spot at upper posterior portion of opercle; short blue lines in large dark spot posteriorly in dorsal fin, mostly parallel to rays, those in outer part of spot longer; a blue line on outer part of 14th and 15th rays; first half of soft portion of anal fin with a bright blue margin, followed by a series of bright blue lines, each along outer part of next six rays; last four rays of fin without blue markings.

Remarks: Eighteen valid species of *Centropyge* are presently known, including *hotumatua* but not *Holacanthus multifasciatus* Smith and Radcliffe which Fraser-Brunner (1933) placed in *Centropyge*. The latter species warrants



Randall, John E. and Caldwell, David
K.

↑

. 1973. "A new butterflyfish of the genus *Chaetodon* and a new angelfish of the genus *Centropyge* from Easter Island." *Contributions in science* 237, 1–11.
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