Zootaxa 4173 (3): 289–295
http://www.mapress.com/j/zt/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

http://doi.org/10.11646/zootaxa.4173.3.7
http://zoobank.org/urn:lsid:zoobank.org:pub:50570752-1563-45F8-B7FB-A395AE34FFC2

Grammatonotus brianne, a new callanthiid fish from Philippine waters, with short accounts of two other *Grammatonotus* from the Coral Triangle

WILLIAM D. ANDERSON, JR.[1], BRIAN D. GREENE[2] & LUIZ A. ROCHA[3]

[1]*Grice Marine Biological Laboratory, College of Charleston, 205 Fort Johnson, Charleston, South Carolina 29412-9110, USA. E-mail: andersonwd@cofc.edu*
[2]*Association for Marine Exploration, 73-4100 Kumuao Place, Kailua-Kona, Hawaii 96740, USA. E-mail: bgreene@hawaii.edu*
[3]*California Academy of Sciences, 55 Music Concourse Drive, Golden Gate Park, San Francisco, California 94118, USA. E-mail: LRocha@calacademy.org*

Abstract

In May 2014, a group of ichthyologists from the California Academy of Sciences and the Bishop Museum collecting fishes off the coast of Batangas, Luzon, Philippine Islands, obtained, in a depth of ca. 150 meters, four specimens of a species of *Grammatonotus* previously unknown to science. This new species, *Grammatonotus brianne,* is distinguishable from its described congeners by the following combination of characters: short anal-fin spines, rhomboid shaped caudal fin, lateral line usually disjunct, and live coloration. Herein we provide characters that distinguish callanthiids from other percoids and that distinguish *Grammatonotus* from *Callanthias*, the other genus in the family Callanthiidae, along with the description of the new species and short accounts of two other *Grammatonotus*, *G. crosnieri* and *G. roseus*, from the Coral Triangle.

Key words: *Grammatonotus brianne*, *Grammatonotus crosnieri*, *Grammatonotus roseus*, Batangas, Luzon, Philippines, Kai Islands, Indonesia

Introduction

There are two genera in the marine perciform family Callanthiidae, *Callanthias* Lowe, 1839 (the Splendid Perches—with seven species, Anderson *et al.,* 2015) and *Grammatonotus* Gilbert, 1905 (the Groppos—with *G. brianne* **n. sp.** becoming the eighth described species). The previously described species of *Grammatonotus* are: *G. ambiortus* Prokofiev, 2006; *Grammatonotus crosnieri (*Fourmanoir, 1981); *Grammatonotus lanceolatus* (Kotthaus, 1976); *Grammatonotus laysanus* Gilbert, 1905; *Grammatonotus macrophthalmus* Katayama, Yamamoto, and Yamakawa, 1982; *Grammatonotus roseus* (Günther, 1880); and *Grammatonotus surugaensis* Katayama, Yamakawa, and Suzuki, 1980. Groppos are brightly colored planktivorous fishes found in moderately deep waters (to depths of a few hundred meters), most commonly in areas with considerable relief. The species of *Grammatonotus* and *Callanthias*, share three characters, a combination that is unusual among percoid fishes: nasal organ with poorly developed lamellae, presence of modified scales with unique ornamentation along body midlaterally, and lateral line running along base of dorsal fin to terminate near base of ultimate dorsal soft ray or continuing posteriorly on dorsolateral surface of caudal peduncle (Anderson and Johnson, 1984; Johnson, 1984; Anderson *et al.*, 2015). In addition, the species of those genera have an unusual arrangement of the supraneural bones, which do not interdigitate with the neural spines; instead they are oriented more or less obliquely, with their proximal ends usually terminating anterior to or dorsal to distal end of anteriormost neural spine (Anderson *et al.*, 2015).

Grammatonotus can be distinguished from *Callanthias* (type species *Callanthias paradisaeus* Lowe, 1839 = *C. ruber*) by the following characters (with those of *Callanthias* in parentheses): one opercular spine (vs. two opercular spines); soft rays in dorsal fin usually 9, rarely 8 or 10 (vs. 10 or 11, very rarely 9 or 12); soft rays in anal fin 9 (vs. 10 or 11, very rarely 9 or 12); branched caudal-fin rays 13 = 7 + 6 (vs. 15 = 8 + 7); first caudal vertebra

Accepted by E. Hilton: 2 Sept. 2016; published: 5 Oct. 2016

without parapophyses (vs. parapophyses present)—see Anderson and Johnson (1984:949) and Anderson *et al.* (2015:5, 6).

Methods and abbreviations

Methods used were those of Anderson *et al.*, 2015, except gillrakers and pseudobranchial filaments were counted on the left side in the new species. Institutional abbreviations are: BMNH (Natural History Museum, London), CAS (California Academy of Sciences, San Francisco), MNHN (Muséum national d'Histoire naturelle, Paris), MUSORSTOM (collaborative program between MNHN and l'Institut Français de Recherche Scientifique pour le Développement Coopération, ORSTOM), PNM (National Museum of the Philippines, Manila), and USNM (National Museum of Natural History, Smithsonian Institution, Washington, DC). SL denotes standard length.

Grammatonotus brianne, new species

Batangas Groppo
(Figure 1; Tables 1, 2)

Diagnosis. A species of *Grammatonotus* distinguishable from the other described species of the genus by the following combination of characters: caudal fin rhomboid shaped with mid-caudal rays produced, lateral-line usually disjunct (7 of 8 lateral lines disjunct, counts made on both sides of each specimen), anal-fin spines short (see Tables 1 & 2), and live coloration distinctive (see Fig. 1 and description of coloration below).

FIGURE 1. *Grammatonotus brianne* **n. sp.** Batangas, southern Luzon, Philippine Islands; holotype, PNM 15196 (formerly CAS 237785), 84.4 mm SL. Photograph by Luiz A. Rocha.

Description. Dorsal fin not incised at junction of spinous and soft portions. Dorsal-fin rays XI, 9. Anal-fin rays III, 9. Pectoral-fin rays 18 or 19. Pelvic-fin rays I, 5. Caudal fin rhomboid shaped with median rays produced. Principal caudal-fin rays 15 (8 + 7); branched caudal-fin rays 13 (7 + 6); procurrent caudal-fin rays 6 dorsally, 6 or 7 ventrally. Branchiostegal rays 6. Pseudobranch with ca. 10 to ca. 14 filaments. Gillrakers long and slender, 7 or 8 + 19 or 20, total number on first gill arch 26 to 28. Lateral line ascending abruptly from its origin near opercle to run just below dorsal-fin base; tubed lateral-line scales 15 to 17 (lateral line usually disjunct, with 2 scales near opercle separated from main part of lateral line); other tubed scales present in various places that are not in main part of lateral line. Midbody lateral scales 24 or 25. Rows of cheek scales 4 or 5. Scales between dorsal-fin origin and lateral line 1 or 2. Scales between anal-fin origin and lateral line (counted along a posterodorsal series) 8 or 9. Circum-caudal-peduncular scales 15 to 17. Morphometric data are presented in Tables 1& 2.

Vertebrae 24 (10 precaudal + 14 caudal). Parapophyses absent from first caudal vertebra. No spur on posteriormost ventral procurrent caudal-fin ray; penultimate ventral procurrent caudal-fin ray not shortened basally

(see Johnson, 1975). Parhypural autogenous, with well-developed hypurapophysis; hypural 1 + hypural 2 present as a single unit, no evidence of ontogenetic fusion; hypural 3 + hypural 4 present as a single unit, no evidence of ontogenetic fusion; hypural 5 autogenous; epurals 3. Epineurals associated with first 11 to 13 vertebrae. One trisegmental pterygiophore associated with dorsal fin, and one with anal fin. Configuration of supraneural bones, anterior neural spines, and anterior dorsal pterygiophores difficult to depict in the conventional symbolization of Ahlstrom *et al.* (1976) because supraneural bones do not actually interdigitate with neural spines; the two supraneural bones oriented more or less obliquely with their proximal ends usually terminating anterior to or dorsal to distal end of anteriormost neural spine.

Body compressed, moderately deep. Mouth terminal and oblique; jaws almost equal. Maxilla reaching posteriorly to near middle of eye. Premaxilla protrusile. No supramaxilla. Interorbital convex. One opercular spine; distal margins of interopercle and subopercle smooth; margin of preopercle smooth to somewhat roughened.

Premaxilla with outer series of conical teeth and usually one to a few small canines or canine-like teeth at anterior end of jaw; inner band of villiform to small conical teeth, band expanded near symphysis; no teeth at symphysis. Dentary with series of conical teeth (a few well back on jaw enlarged into caninform teeth); patch of villiform to conical teeth next to symphysis; usually one to a few exserted canines at anterior end of jaw; no teeth at symphysis. Vomer with small conical teeth, arranged in a chevron-shaped patch, patch without posterior prolongation. Palatine with row or band of villiform to small conical teeth. No teeth on tongue or pterygoids.

Scales peripheral ctenoid (Roberts, 1993:92); posterior field of a scale with primary and secondary cteni (i.e., no ctenial bases present in posterior field). Body with midlateral series of modified scales (see Anderson *et al.*, 2015:74, fig. 2). Secondary squamation absent on scales. Most of head, including maxilla, dentary, dorsum of snout, and interorbital region with scales. Dorsal, anal, pectoral, and pelvic fins without (or nearly without) scales; pelvic axillary scales present; modified scales (interpelvic process) overlapping pelvic-fin bases along midventral line; scales extending well out onto caudal fin.

TABLE 1. Morphometric data for *Grammatonotus brianne.* Standard length in mm; other measurements in percentage of standard length.

	n	Range		n	Range
Standard length	4	72.9–84.4	Depth of caudal peduncle	4	14.4–16.2
Depth at dorsal-fin origin	4	33.0–35.4	Mid-caudal fin rays	4	58.6–82.2
Predorsal length	4	30.6–33.5	Depressed anal-fin length	4	~39.2–42.2
Head length	4	29.5–32.1	First anal-spine length	4	2.8–3.4
Snout length	4	4.4–5.3	Second anal-spine length	4	5.3–7.3
Bony orbit diameter	4	9.7–11.1	Third anal-spine length	4	7.5–9.2
Interorbital width	4	7.0–7.7	Anal fin, base length	4	18.0–20.3
Postorbital length of head	4	12.4–14.2	Penult. dorsal-fin ray length	4	19.8–22.7
Upper jaw length	4	12.6–14.2	Last dorsal-fin ray length	4	~16.0–19.0
Pectoral-fin length	4	22.7–25.6	Penult. anal-fin ray length	4	18.2–21.5
Pelvic-fin length	3	26.7–28.6	Last anal-fin ray length	4	~13.7–18.0
Length of caudal peduncle	4	23.8–24.6			

Coloration. Coloration based on digital photographs of two specimens (PNM 15196, formerly CAS 237785, 84.4 mm SL, the holotype [Fig. 1], and CAS 237786, 77.7 mm SL, a paratype): Dorsally head and body rosy to red; ventrally head and area below base of pectoral fin pale yellow to silvery; mid-body pink to pale rose above dull yellow; ventrally body pale yellow to faint purplish. Iris of eye yellow centrally with dark red to rose peripherally (widest ventrally); short band of blue at dorsalmost part of iris. Dorsal fin yellow to yellow orange proximally, light to dark purple distally (distal ends of dorsal spines yellow); anal fin light purple; pectoral fin pale yellow; pelvic fin light purple. Caudal fin pale to bright yellow proximally, pale yellow distally. Numerous bright yellow spots superimposed on ground coloration of proximal part of dorsal fin and all or most of caudal fin.

Comparisons. *Grammatonotus brianne* **n. sp.** and *G. crosnieri* (Fourmaoir, 1981) have been collected off Batangas Province, Luzon, in the Coral Triangle. Another *Grammatonotus*, *G. roseus* (Günther, 1880), is also

known from the Coral Triangle; the types and only known specimens of that species are from the Banda Sea off the Kai Islands, Indonesia. *Grammatonotus brianne* **n. sp.** is most easily distinguished from those two species by the shape of the caudal fin—*G. brianne* **n. sp.** with a rhomboid shaped fin with mid-caudal rays produced, *G. crosnieri* with upper and lower lobes of caudal fin produced (examined specimens less than 70 mm SL with damaged caudal fins), and *G. roseus* with a subtruncated fin (Günther, 1880:45, plate XX, fig. D). In Table 2, we present comparisons of selected measurements for the three species of *Grammatonotus* known from the Coral Triangle.

Distribution. This species is only known from specimens collected off Batangas Province, Luzon Island, Philippines.

Material examined. Four specimens (72.9–84.4 mm SL) caught off Batangas Province, Luzon Island, Philippines; Mabini Dive & Trek; 13°48.035' N, 120°54.635' E.; depth of ca. 150 meters; collected by Brian Greene, 21/22 May 2014.

Holotype. PNM 15196 (formerly CAS 237785), 84.4 mm SL.

Paratypes. CAS 237786, 77.7 mm SL; CAS 237787, 72.9 mm SL; USNM 432499 (formerly CAS 237788), 82.4 mm SL.

Etymology. The name *brianne* is for the second author's wife (Brianne M. Atwood) and is a noun in apposition to the generic name *Grammatonotus*.

TABLE 2. Comparisons of morphometric data in three species of *Grammatonotus.* Standard length in mm; other measurements in percentage of standard length. NM = not measured. NP = not produced.

	G. brianne		*G. crosnieri*		*G. roseus*	
	n	Range	n	Range	n	Range
Standard length	4	72.9–84.4	9	41.9–118	5	49.2–64.6
Depth at dorsal-fin origin	4	33.0–35.4	9	30.5–39.2	5	35.4–37.2
Head length	4	29.5–32.1	9	28.5–33.9	5	33.0–35.6
Snout length	4	4.4–5.3	9	4.3–5.4	5	5.1–6.5
Bony-orbit diameter	4	9.7–11.1	9	11.0–14.9	5	13.2–14.6
Pectoral-fin length	4	22.7–25.6	9	22.0–28.9	5	25.0–26.1
Pelvic-fin length	3	26.7–28.6	8	27.2–41.1+	2	24.8+–25.3
Upper caudal-fin lobe	NP	-	7	38.2+–116.6+	NM	-
Lower caudal-fin lobe	NP	-	7	31.5–107.7+	NM	-
Mid-caudal-fin rays	4	58.6–82.2	NM	-	NM	-
Depressed anal-fin length	4	~39.2–42.2	8	33.4–70.1	-	-
First anal-spine length	4	2.8–3.4	9	6.2–10.3	3	4.5–6.5
Second anal-spine length	4	5.3–7.3	7	9.4–14.3	5	7.9–9.3
Third anal-spine length	4	7.5–9.2	9	11.1–15.3	4	9.6–11.4
Penultimate dorsal-fin ray length	4	19.8–22.7	7	16.7–19.6	-	-
Ultimate dorsal-fin ray length	4	~16.0–19.0	7	12.8–16.8	1	14.2

***Grammatonotus crosnieri* (Fourmanoir, 1981)**

Crosnier's Groppo, Uncle Phoo's Groppo

(Figure 2; Table 2)

Callanthias crosnieri Fourmanoir, 1981:91, fig. 15 (original description; illustration; holotype MNHN 1978–79, 116 mm SL; type locality Philippines, off Batangas Province, southern Luzon Island, MUSORSTOM cruise Station 6, 14°01.2′ N, 120°20.0' E, 200 meters).

Grammatonotus crosnieri (Fourmanoir, 1981): Anderson, 2000: 2556 (species account, illustration).

Description. Dorsal-fin rays XI, 9. Anal-fin rays III, 9. Pectoral-fin rays 18 to 20 (usually 19). Pseudobranch with 11 to 17 filaments. Gillrakers 8 or 9 + 18 to 20, total 26 to 29. Tubed lateral-line scales 14 to 17. Midbody lateral

scales 23 to 25. Circum-caudal peduncular scales 16. Scales between anal-fin origin and lateral line 8 or 9. Anal spines long (see Table 2). Caudal fin damaged in smaller specimens (< 70 mm SL); in larger specimens, caudal fin with upper and lower lobes well produced. Selected morphometric data are presented in Table 2.

FIGURE 2. *Grammatonotus crosnieri*. Philippine Islands, 71 mm SL. Photograph by Pierre Fourmanoir.

Coloration. The following description is based on a color transparency provided by Pierre Fourmanoir of a 71–mm SL specimen of *Grammatonotus crosnieri* collected in the Philippines (see Fig. 2). Dorsum of head rosy, side of head ventral to orbit silvery, ventral midline of head rosy. Iris of eye mostly pallid with broad blue blotch above narrow rosy stripe at dorsal border, narrow rosy arch at ventral and posterorventral borders, and some yellow posteriorly. Bright rosy stripe (one or two scales high) ventral to dorsal fin and continuing on dorsal surface of caudal peduncle. Rest of body mostly pale yellow to rose with brownish rivulations, except for silvery area anterior and ventral to base of pectoral fin. Ventral half of spinous dorsal fin mostly yellow green with distal portions of dorsal spines and most of soft dorsal fin rosy. Pectoral fin mostly dull orange; pelvic and anal fins mostly rose. Middle of caudal fin mostly yellow; several of dorsalmost and ventralmost caudal fin rays rosy.

Distribution. Known from the Philippines (off Batangas Province, southern Luzon Island) in depths of 150 to 210 meters and reported from the west coast of the Malay Peninsula in 200 to 400 meters (Fourmanoir, 1981:92).

Material examined. Nine specimens, 41.9 to 118 mm SL. **PHILIPPINES**, off Luzon Island (Batangas Province): MNHN 1978–79 (holotype: 116 mm SL), MNHN 1978–80 (2 paratypes: 110–118), MUSORSTOM 2–Station 12 (4: 41.9–116), MUSORSTOM 2–Station 51 (2: 57.8–97.5).

***Grammatonotus roseus* (Günther, 1880)**

Rosy Groppo

(Figure 3, Table 2)

Heliastes roseus Günther, 1880:45, plate XX, fig. D (original description, illustration; lectotype, herein designated, BMNH 1879.5.14.10, 64.6 mm SL; type locality off the Kai Islands, Indonesia, *Challenger* station 192).

Zabulon roseus: Whitley, 1928:297 (new combination).

Description. Dorsal-fin rays XI, 9. Anal-fin rays III, 9. Pectoral-fin rays 19. Pseudobranch with 11 or 12 filaments. Gillrakers 7 to 9 + 17 to 19, total 24 to 28. Tubed lateral-line scales 14 to 17. Midbody lateral scales 24 to 27. Circum caudal-peduncular scales 15 or 16. Scales between anal-fin origin and lateral line 8 or 9. Caudal fin subtruncated (Günther, 1880:45, plate XX, fig D). Selected morphometric data are presented in Table 2.

Coloration. "Uniform rose coloured" **(**Günther, 1880:45).

FIGURE 3. *Grammatonotus roseus.* Kai Islands, Indonesia; lectotype of *Heliastes roseus* (= *Grammatonotus roseus*); BMNH 1879.5.14.10, 64.6 mm SL. Photograph by James Maclaine.

Designation of lectotype. When Günther (1880:45) described *Heliastes roseus* he did not designate a holotype. There are five syntypes of this species in the Natural History Museum, London: BMNH 1879.5.14:10–11 (two specimens, 53.0 & 64.6 mm SL) and BMNH 1890.2.26:141–3 (three specimens, 49.2–58.9 mm SL). To unequivocally fix the name of this species to a zoological entity, we hereby designate as the lectotype of *Heliastes roseus* the syntype of 64.6 mm SL (BMNH 1879.5.14.10). By that action the other syntypes—BMNH 1879.5.14.11 (53.0 mm SL) and BMNH 1890.2.26.141–3 (3: 49.2–58. 9 mm SL) become paralectotypes.

Distribution. Known only from the type specimens collected off the Kai Islands, Indonesia, at *Challenger* station 192 (5°49'15" S, 132°14'15" E, in 129 fathoms –236 meters).

Comment. Along with the type specimens of *Grammatonotus roseus,* the lectotype and paralectotype of *Propoma roseum* (= *Symphysanodon* typus, family Symphysanodontidae) were also collected at *Challenger* station 192 (Anderson, 1970:333).

Material examined. Five specimens, 49.2 to 64.6 mm SL. **INDONESIA,** off the Kai Islands: BMNH 1879.5.14.10 (lectotype: 64.6 mm SL), BMNH 1879.5.14.11 (paralectotype: 53.0 mm SL), BMNH 1890.2.26.141–3 (3 paralectotypes: 49.2–58.9 mm SL).

Acknowledgments

This research was supported by National Science Foundation grant DEB 12576304 to Terrence Gosliner, Richard Mooi, Luiz Rocha and Gary Williams to inventory the biodiversity of the Verde Island Passage, and by the California Academy of Sciences. All specimens were collected under Gratuitous Permits (GP-0077-14, GP-0085-15) in accordance with the terms and conditions of the permits and under the supervision of our Philippines partners. The following assisted in several ways, including sending specimens on loan, furnishing information, providing photographs and radiographs, and scanning photographic transparencies: Marie-Louise Bauchot, Dave Catania, Robin Curry, Don Dumale, the late Pierre Fourmanoir, James Maclaine, the late James F. McKinney, Sandra Raredon, Greg Townsley, and the late Alwyne Wheeler. G. David Johnson took some of the data on specimens of Grammatonotus crosnieri and G. roseus, and, using Photoshop, improved the image for Figure 2. William F. Smith-Vaniz and G. David Johnson made valuable comments on presubmission drafts of the manuscript.

This is contribution number 478 of the Grice Marine Biological Laboratory, College of Charleston.

References

Ahlstrom, E.H., Butler, J.L. & Sumida, B.Y. (1976) Pelagic stromateoid fishes (Pisces, Perciformes) of the eastern Pacific: Kinds, distributions, and early life histories and observations on five of these from the northwest Atlantic. *Bulletin of Marine Science*, 26 (3), 285–402.

Anderson, W.D. Jr. (1970) Revision of the genus *Symphysanodon* (Pisces: Lutjanidae) with descriptions of four new species. *Fishery Bulletin*, 68 (2), 325–346.

Anderson, W.D. Jr. (2000)Callanthiidae. *In*: Carpenter, K.E. & Niem, V.H. (Eds.), *FAO Species Identification Guide for Fishery Purposes. The Living Marine Resources of the Western Central Pacific.* Vol. 4. *Bony Fishes Part 2* (*Mugilidae to Carangidae)*. Food and Agriculture Organization of the United Nations, Rome, 2553–2556. [Dated 1999, but published in 2000]

Anderson, W.D. Jr. & Johnson, G.D. (1984) A new species of *Callanthias* (Pisces: Perciformes: Percoidei: Callanthiidae). *Proceedings of the Biological Society of Washington,* 97 (4), 942–950.

Anderson, W.D. Jr., Johnson, G.D. & Baldwin, C.C. (2015) Review of the splendid perches, *Callanthias* (Percoidei: Callanthiidae). *Transactions of the American Philosophical Society* 105 (Part 3). Philadelphia, i–xxii + 1–126, plates 1–8, figures 1–23, tables 1–20, maps 1–5.

Fourmanoir, P. **(**1981) Poissons (première liste). *In*: *Résultats des Campagnes Musorstom. I. Philippines (18–28 mars 1976). Mémoires de l'ORSTOM (Office de la Recherche Scientifique et Technique Outre-Mer)*, No. 91 (Art. 3), 85–102.

Gilbert, C.H. (1905) The deep-sea fishes of the Hawaiian Islands. *In*: Jordan, D.S. & Evermann, B.W. (Eds.), *The aquatic resources of the Hawaiian Islands*. *Bulletin of the United States Fish Commission,* 23 (for 1903), Part II, Section II, 575–713, plates 66–101.

Günther, A. **(**1880) Report on the shore fishes procured during the voyage of H.M.S. Challenger in the years 1873–1876. *In: Report on the scientific results of the voyage of H.M.S. Challenger during the years 1873–76. Zoology* 1 (Part 6), 1–82, plates 1–32. [Reprinted in 1963 by J. Cramer, Weinheim.]

Johnson, G.D. (1975) The procurrent spur: An undescribed perciform caudal character and its phylogenetic implications. *Occasional Papers of the California Academy of Sciences,* 121, 1–23.

Johnson, G.D. (1984) Percoidei: Development and relationships. *In*: Moser, H.G., Richards, W.J., Cohen, D.M., Fahay, M.P., Kendall, A.W., Jr. & Richardson, S.L. (Eds.), *Ontogeny and Systematics of Fishes*. American Society of Ichthyologists and Herpetologists, Special Publication No. 1, Allen Press, Lawrence, Kansas, 464–498.

Katayama, M., Yamakawa, T. & Suzuki, K. (1980) *Grammatonotus surugaensis*, a new serranid fish from Suruga Bay and the Straits of Ōsumi, Japan. *Bulletin of the Biogeographical Society of Japan,* 35 (4), 45–48.

Katayama, M., Yamamoto, E. & Yamakawa, T. (1982) A review of the serranid fish genus *Grammatonotus*, with description of a new species. *Japanese Journal of Ichthyology,* 28 (4), 368–374, figs. 1–4.

Kotthaus, A. **(**1976) Fische des Indischen Ozeans. Ergebnisse der ichthyologischen Untersuchungen während der Expedition des Forschungsschiffes "Meteor" in den Indischen Ozean, Oktober 1964 bis Mai 1965. A. Systematischer Teil, XVII. Percomorphi (7). *"Meteor Forschungsergebnisse*, Reihe D, No. 23, 45–61.

Lowe, R.T. (1839) A supplement to a synopsis of the fishes of Madeira. *Proceedings of the Zoological Society of London,* Part 7, 76–92.

Prokofiev, A.M. (2006) *Grammatonotus ambiortus* sp. nova: A new species of callanthiids (Perciformes) from the western tropical Pacific. *Journal of Ichthyology*, 46 (1), 13–17. [Originally published in Russian in *Voprosy Ikhtiologii*, 2006, 46 (1), 17–21.]

Roberts, C.D. (1993) Comparative morphology of spined scales and their phylogeneticsignificance in the Teleostei. *Bulletin of Marine Science*, 52 (1), 60–113.

Whitley, G.P. (1928) Fishes from the Great Barrier Reef collected by Mr. Melbourne Ward. *Records of the Australian Museum*, 16 (6), 294–304.