Japanese Journal of Ichthyology
Vol. 28, No. 4 1982

魚類学雑誌
28巻4号 1982年

A Review of the Serranid Fish Genus *Grammatonotus*, with Description of a New Species

Masao Katayama, Eiichi Yamamoto and Takeshi Yamakawa

(Received March 12, 1981)

Abstract The serranid fish genus *Grammatonotus* is closely related to *Callanthias*, but differs in having one opercular spine, tubular anterior nostrils, 13 branched caudal fin rays and a larger number of transverse rows of scales between the upper end of the gill opening and the base of the caudal fin. *Grammatonotus* includes three species: *G. laysanus* Gilbert from Laysan Island; *G. surugaensis* Katayama, Yamakawa et Suzuki from Suruga Bay and the Straits of Osumi, Japan; *G. macrophthalmus*, sp. nov. from the Kyushu-Palau Ridge. *G. macrophthalmus* is distinctive in having large eyes, longer than postorbital length of the head.

The original description of the serranid fish, *Grammatonotus laysanus*, was made by Gilbert (1905) on the basis of a specimen, 38 mm in standard length from near Laysan Island. However, the description was incomplete because the specimen was damaged. A second specimen from the Emperor Seamount Chain was reported with a brief description by the Far Seas Fisheries Research Laboratory (1972). Two other specimens of this species, which were recently collected from the Kinmei Ridge of the Emperor Seamount Chain by the T/V Hokusei-Maru, bottom trawler of the Faculty of Fisheries, Hokkaido University, allowed us to make a complete description.

Another species in the genus, *Grammatonotus surugaensis*, from Suruga Bay and the Straits of Osumi, was recently described by Katayama et al. (1980). Nine specimens of a third species of *Grammatonotus* were collected in 1978 during a survey of demersal fish made on the Kyushu-Palau Ridge in the Pacific Ocean by the Nansei Regional Fisheries Research Laboratory, Japan.

In the present paper, we will describe more completely *G. laysanus* and the third species as new under the name of *G. macrophthalmus*. We will also provide a key and review all of these species.

In this paper, the length of the caudal peduncle is the distance between the rear base of the anal fin and the lower edge of the caudal fin base. The number of scales in longitudinal series is that of transverse rows of scales between the upper end of the gill opening and the base of the caudal fin. Counts for vertebrae and predorsal bones were taken from radiographs.

Type specimens are deposited in the following institutions: National Science Museum, Tokyo (NSMT), Laboratory of Marine Zoology, Faculty of Fisheries, Hokkaido University (HUMZ), and Marine Science Museum, Tokai Univeristy (MSM).

Genus ***Grammatonotus*** Gilbert, 1905

Grammatonotus Gilbert, 1905: 618 (Type species, *Grammatonotus laysanus* Gilbert, 1905, by monotypy)

Body ovoid or elongate (depth 28～36% of SL), moderately compressed. Snout short, evenly rounded. Nostrils two, far apart from each other; anterior nostril tubular. Large sensory pores on head. No supramaxilla. Opercle with one spine; preopercle rounded and smooth; subopercle and interopercle smooth. Jaws with a single row of enlarged teeth; one or two canines on each side of the tip of both jaws; small teeth on vomer and palatines; tongue smooth. Gill rakers long and numerous, 17 to 20 on lower limb of first arch. Branchiostegals 6. Dorsal fin unnotched, XI, 9; anal fin III, 9; posterior dorsal and anal rays longer than anterior ones. Pectoral fin asymmetrical, the upper rays longest; its fin rays 18～20, most rays branched. Caudal fin with 13 branched rays; some rays produced into filaments. Pelvic fins I, 5. Scales large, ctenoid and deciduous; head closely scaled except for lips; pored lateral line scales 15～17; scales in longitudinal series

25～26. Lateral line running along base of dorsal fin and ending below last dorsal ray. Predorsal bones 2. Vertebrae 10+14.

Remarks. This genus is closely related to *Callanthias*, but differs from it in having one opercular spine (2 in *Callanthias*), 13 branched caudal fin rays (15 in *Callanthias*), tubular anterior nostril and smaller number of scales in longitudinal series (25～26, versus 40～50). *Grammatonotus* should be placed in the subfamily Callanthiinae together with *Callanthias*.

Heliastes roseus Günther, 1880, from Ki Islands, was originally described as a new species of the Pomacentridae, and later Whitley (1928) erected a new genus, *Zabulon*, for it. Norman (1957) transferred this genus to the Serranidae and placed it in the synonymy of *Grammatonotus*. The original description of *Z. roseus* was brief, and it was difficult to compare it with the species of *Grammatonotus* which we will describe here. According to Günther's (1880) description, it has several similarities with ours in body shape, number of fin rays and high-running lateral line, and some different characteristics such as a subtruncated caudal fin and the presence of a scaly process at the pelvic fin axil (in Günther's figure). It is impossible at present to decide whether or not this species should be included in *Grammatonotus*.

Key to the species of *Grammatonotus*

1a. Eye diameter shorter than postorbital length of head, 2.5～2.7 in head; teeth on jaws moderate size; tips of dorsal spines yellow 2

1b. Eye diameter longer than postorbital length of head, 2.2～2.4 in head; teeth on jaws rather large; tips of dorsal spines pink .....*G. macrophthalmus*, sp. nov.

2a. Caudal fin rounded with produced outer rays; interorbital space narrower than eye diameter; length of caudal peduncle longer than depth of caudal peduncle; length of third anal spine longer than first dorsal spine.....*G. laysanus*

2b. Several caudal fin rays produced into filaments; interorbital space as wide as eye diameter; length of caudal peduncle about equal to depth of caudal peduncle; length of third anal spine slightly shorter than first dorsal spine .....*G. surugaensis*

Grammatonotus laysanus Gilbert
(Fig. 1)

Grammatonotus laysanus Gilbert, 1905: 618, fig. 240 (type locality: near Laysan Island); Gosline and Brock, 1960: 157 (compiled); Far Seas Fisheries Research Laboratory, 1972: 101, Norpac 28 (description; Emperor Seamount Chain, 31°59.6′N, 173°08.7′E, depth 355 m); Tinker, 1978: 192 (compiled).

Material. HUMZ 68678, 138 mm SL, Emperor Seamount Chain, 35°35.8′N, 171°18.9′E, depth 340 m, July 30, 1977; HUMZ 75430, 129 mm SL, Emperor Seamount Chain, 1977.

Diagnosis. Greatest body depth 3.07～3.31 in SL; diameter of orbit shorter than postorbital length of head, 2.55～2.59 in head; interorbital space narrower than eye diameter, 3.26～3.50 in head. Length of caudal peduncle longer than its depth, 1.33～1.45 in head. Third anal spine slightly longer than first dorsal spine, 4.40～4.42 in head; longest soft dorsal ray 1.33～1.38, longest soft anal ray 1.33～1.40 in head. Caudal fin rounded with produced outer rays; its longest ray 1.79～1.87 in SL. Teeth on jaws moderate. Body violet red; tips of dorsal spines yellow; caudal violet red, outer rays yellow.

Description. Dorsal fin rays XI, 9; anal fin rays III, 9; pectoral fin rays 20 and 19; pored lateral line scales 16 and 17; scales in longitudinal series 26; gill rakers on first arch 8+20.

Body width just behind gill opening 6.59 and 7.17 in SL; snout very short, evenly rounded, 4.19 and 4.67 in head; interorbital space broad and convex. Depth of caudal peduncle shorter than its length, 1.83 and 2.08 in head.

Mouth moderately large and oblique; upper jaw length 2.20 and 2.21 in head; maxilla narrow, reaching below middle of pupil. Anterior nostril with a short and broad tube in front of eye; posterior nostril rather large and ovoid, widely separated from the anterior, located on upper orbital rim but little in advance of pupil. A series of pores of sensory canal on mandible and one extending from sides of snout around posterior half of orbital rim, and on suborbitals. Upper jaw with a single row of enlarged teeth; one or two canines on each side of tip of upper jaw; lower jaw with a patch of villiform teeth anteriorly; one or two canines on each side of tip of lower jaw, directed anteriorly; and posteriorly two canines on each side; a row of

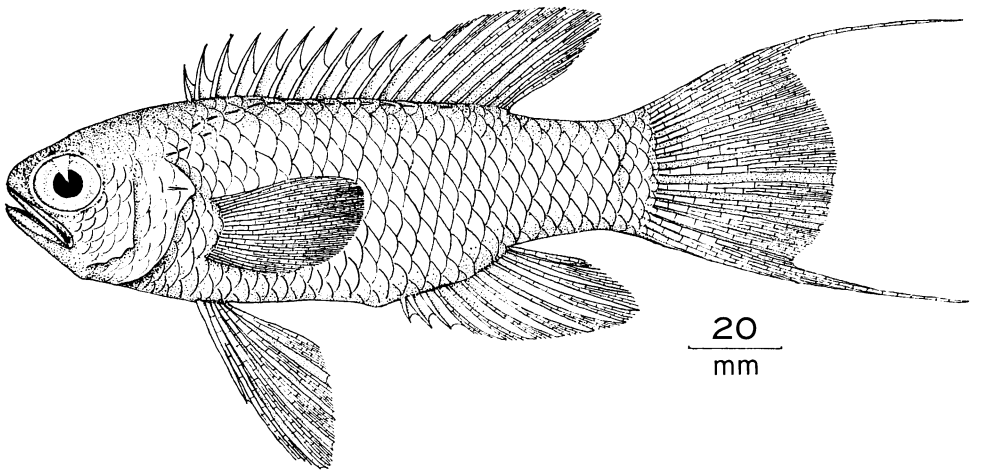

Fig. 1. *Grammatonotus laysanus* Gilbert from Emperor Seamount Chain, HUMZ 68678, 138 mm in standard length.

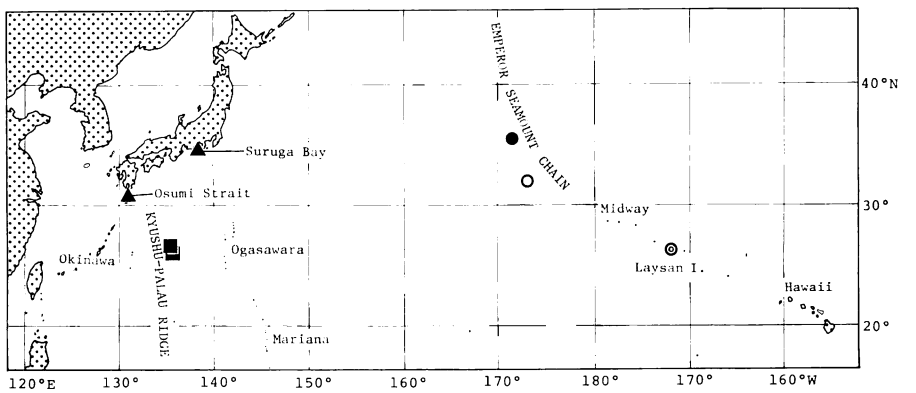

Fig. 2. Distribution of the genus *Grammatonotus*. *G. laysanus*: open circle (present specimens), double circle (holotype, near Laysan I.) and solid circle (Far Seas Fisheries Research Laboratory, 1972). *G. surugaensis*: triangular (Katayama et al., 1980). *G. macrophthalmus*, sp. nov.: solid squares.

enlarged teeth on side of lower jaw; small teeth on vomer and palatines; tongue smooth. Preopercle rounded, with entire margin; opercle with a pungent spine; subopercle and interopercle smooth. Gill rakers close-set and long, the longest one longer than gill filament.

Dorsal unnotched, inserted above slightly behind posterior end of operculum; dorsal spine slender and flexible; sixth dorsal spine longest, 2.44 and 2.33, last dorsal spine 2.70 and 2.36, and longest soft dorsal ray (7th) 1.38 and 1.33 in head; anal fin inserted below base of last dorsal spine; third anal spine longer than second; length of first anal spine 7.33 and 8.08, second anal spine 5.50 and 5.25, third anal spine 4.40 and 4.42, and longest soft anal ray (6th) 1.33 and 1.40 in head. Pectoral fin asymmetrical, the upper rays longest, reaching vertical through vent; the rays mostly branched. Pelvic fin inserted slightly anterior to lower end of pectoral fin base, reaching origin of anal fin; their length 3.0 in SL.

Scales large, ctenoid and deciduous; auxiliary scales absent; scales in an oblique row between point of dorsal and vent 10; head closely scaled except for lips; dorsal and anal fin naked. Lateral line ascending rapidly posteriorly, running along base of dorsal fin and ending below

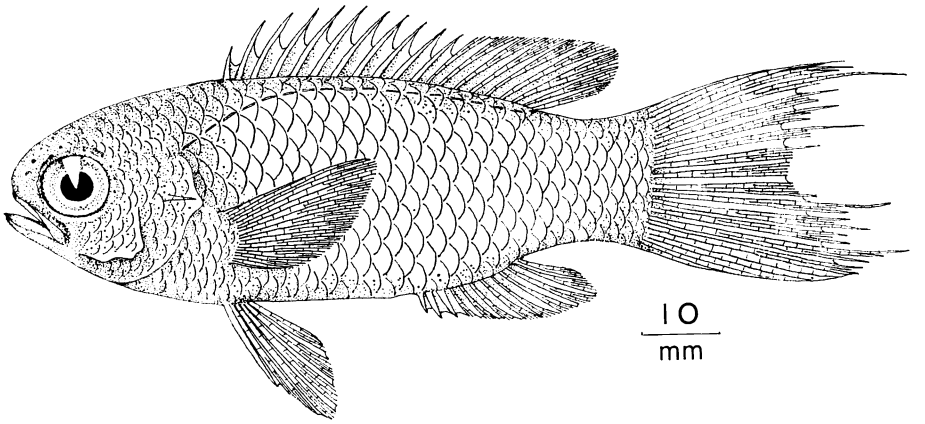

Fig. 3. *Grammatonotus surugaensis* Katayama, Yamakawa et Suzuki from Suruga Bay, NSMT-P 19445, 81 mm SL.

last dorsal ray; anterior part of lateral line disarranged.

Color when fresh: Body violet red, lower side silvery; dorsal fin yellow; anal fin violet; caudal fin violet red, outer rays yellow; pectoral fin pale orange; pelvic fin violet red. In alcohol uniformly pale yellow.

Remarks. The holotype from near Laysan Island (Fig. 2) is 38 mm in SL, The soft dorsal rays, soft anal rays and caudal fin are damaged. Our specimens, captured from the Emperor Seamount Chain near the locality of the holotype, are larger, 138 mm and 129 mm SL, and in good condition. They agree well with the holotype except for having 9 soft dorsal rays, instead of 8 as in the latter, and scaled snout. Scales in this species are deciduous and in our specimens the snout region is scaled. This species differs from *G. surugaensis* and *G. macrophthalmus*, sp. nov. in having a round caudal fin with produced outer rays.

Grammatonotus surugaensis Katayama, Yamakawa et Suzuki
(Japanese name: Tenjiku-hanadai)
(Fig. 3)

Grammatonotus surugaensis Katayama, Yamakawa and Suzuki, 1980: 45, fig. 1 (type locality: Suruga Bay and the Straits of Osumi).

Material. Holotype NSMT-P 19445, 81 mm SL, depth 120 m, off Numazu, Suruga Bay, March 23, 1979; MSM 79–196, 63 mm, collected with holotype; NSMT-P 19446, 77 mm, from Straits of Osumi, August 10, 1973.

Diagnosis. Greatest depth 2.79～2.93 in SL; diameter of orbit shorter than postorbital length of head, 2.63～2.68 in head; interorbital space about as wide as eye diameter, 2.74～2.92 in head. Caudal peduncle short and deep, its length about equal to depth, 1.78～1.94 in head. Third anal spine slightly shorter than first dorsal spine, 4.77～6.32 in heed; longest soft dorsal ray 1.63～1.85, longest soft anal ray 2.08～2.63 in head. Several caudal fin rays produced into filaments, the longest ray 2.25～3.06 in SL. Teeth on jaws moderate size. Body orange red; tip of spinous dorsal yellow; caudal fin yellow.

Grammatonotus macrophthalmus, sp. nov.
(New Japanese name: Ome-hanadai)
(Fig. 4)

Holotype: NSMT-P 18829, 119 mm SL, collected from Kyushu-Palau Ridge, 26°46.0′N, 135°21.5′E～26°45.6′N, 135°24.5′E, depth 330 m, Jan. 30, 1978.

Paratypes: HUMZ 75138, 103 mm, collected with holotype; HUMZ 75139 and HUMZ 75140, 115 mm and 112 mm, 26°13.5′N, 135°21.0′E～26°06.8′N, 135°52.1′E, depth 360 m, Feb. 11, 1978; HUMZ 75141～75144, 95 mm～102 mm, 26°47.2′E, 135°21.0′E～26°46.2′N, 135°20.7′E, depth 360 m, Jan. 31, 1978; HUMZ 80427, 103 mm, 26°46.0′N, 135°21.6′E～26°45.1′N, 135°20.9′E, depth 330～350 m, Nov. 18, 1978.

Diagnosis. Greatest body depth 3.09～3.50

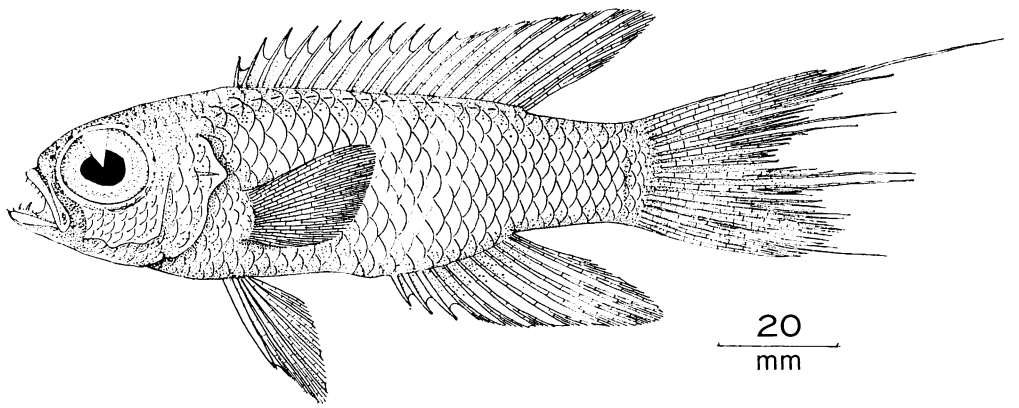

Fig. 4. *Grammatonotus macrophthalmus*, sp. nov. Holotype, NSMT-P 18829, 119 mm SL.

Table 1. Counts and proportional measurements of *Grammatonotus macrophthalmus*, sp. nov.

Characters	Holotype	Paratypes							
	NSMT-P 18829	HUMZ 75138	HUMZ 75139	HUMZ 75140	HUMZ 75141	HUMZ 75142	HUMZ 75143	HUMZ 75144	HUMZ 80427
Standard length (mm)	119	103	115	112	96	102	95	100	103
Total length	198	165	178	182	—	167	175	166	188
Pectoral fin rays	20	19	20	20	20	20	20	19	19
Lateral line scales	15	—	—	—	16	—	—	16	15
Scales in longitudinal series	25	25	—	—	—	—	—	25	25
Gill rakers	8+18	8+19	8+18	8+20	8+19	8+18	8+18	8+18	8+19
In standard length									
Depth of body	3.50	3.22	3.30	3.25	3.28	3.09	3.06	3.11	3.20
Head length	3.43	3.01	3.21	2.95	3.10	2.98	2.97	2.97	3.03
Width of body	7.00	6.60	7.19	7.00	6.62	6.38	6.33	6.52	5.89
Length of pectoral fin	4.96	4.54	4.42	4.36	4.57	4.49	4.22	4.49	4.46
Length of pelvic fin	4.38	4.46	3.97	3.73	4.09	4.02	3.89	3.63	3.76
Longest caudal fin ray	1.32	1.72	1.85	1.60	—	1.62	1.18	1.58	1.24
In head length									
Snout length	5.10	4.68	4.77	5.43	4.43	5.70	5.16	4.72	4.86
Orbital length	2.38	2.39	2.17	2.24	2.28	2.41	2.34	2.43	2.30
Upper jaw length	2.48	2.28	2.24	2.38	2.38	2.50	2.46	2.48	2.43
Interorbital length	3.27	3.35	3.11	3.30	3.16	3.42	3.37	3.40	3.24
Postorbital length of head	2.48	2.50	2.67	2.50	2.30	2.50	2.41	2.50	2.62
Length of caudal peduncle	1.69	1.55	1.53	1.55	1.63	1.55	1.66	1.55	1.74
Depth of caudal peduncle	2.04	2.06	2.01	2.24	1.94	1.94	2.09	1.89	2.00
Length of 1st dorsal spine	5.78	6.84	5.42	5.59	6.02	—	6.04	5.67	6.07
Longest dorsal spine length	2.17	2.28	2.36	2.53	2.28	2.14	2.13	2.48	2.36
Longest dorsal ray length	1.11	1.41	1.23	—	1.11	1.09	1.19	1.23	1.17
Length of 1st anal spine	5.34	5.26	5.34	5.85	6.20	4.89	5.82	6.18	5.48
Length of 2nd anal spine	4.34	4.28	3.98	4.75	4.13	4.38	4.71	4.25	3.86
Length of 3rd anal spine	3.15	3.42	2.98	3.45	2.98	3.49	3.30	3.21	3.04
Longest anal ray length	1.18	1.16	1.23	1.50	1.09	1.16	1.25	1.17	1.26

in SL; diameter of orbit longer than postorbital length of head, 2.17～2.43 in head; interorbital space narrower than eye diameter, 3.11～3.42 in head. Length of caudal peduncle longer than its depth, 1.53～1.74 in head. Third anal spine much longer than first dorsal spine, its length 2.98～3.49; longest soft dorsal ray 1.09～1.41, longest soft anal ray 1.09～1.50 in head. Several caudal fin rays produced into filaments, the longest ray 1.18～1.60 in SL. Teeth on jaws rather large. Body yellowish pink; tips of dorsal spines pink; caudal fin pink.

Description. Counts and proportional measurements of the holotype and paratypes are shown in Table 1. Dorsal fin rays XI, 9; anal fin rays III, 9; pectoral fin rays 19～20; branched caudal fin rays 13; pored lateral line scales 15～16; scales in longitudinal series 25; gill rakers on first arch 8+18～20; predorsal bones 2; vertebrae 10+14.

Body elongate, compressed; dorsal profile of head gently convex from dorsal origin to the blunt rounded snout. Mouth moderately large and oblique; maxilla narrow, reaching below anterior end of pupil. Interorbital space broad and convex. Anterior nostril small, in front of eye; posterior nostril rather large and ovoid, widely separated from the anterior one, located on upper orbital rim but little in advance of pupil. A series of pores of sensory canals on mandible and one extending from side of snout around posterior half of orbital rim, and on suborbitals. Upper jaw with a single row of enlarged teeth; one or two canines on each side of tip of upper jaw; lower jaw with a patch of villiform teeth anteriorly; a canine on each side of tip of lower jaw, directed anteriorly; posteriorly two large canines on each side; a row of somewhat enlarged teeth on side of lower jaw; small teeth on vomer and palatines; tongue smooth. Preopercle rounded, with entire margin; opercle with a pungent spine; subopercle and interopercle smooth. Gill rakers close-set and long, the longest one longer than gill filament.

Dorsal unnotched, inserted above slightly behind posterior end of operculum; dorsal spines slender and flexible; sixth dorsal spine longest; anal inserted below base of last dorsal spine; third anal spine longer than second. Pectoral fin asymmetrical, the upper rays longest, reaching vertical through vent; the rays mostly branched. Pelvic fin inserted slightly anterior to lower end of pectoral fin base, reaching vent.

Scales large, ctenoid and deciduous; auxiliary scales absent; scales in an oblique row between point of dorsal and vent 10; head closely scaled except for lips; dorsal and anal fins naked. Lateral line ascending rapidly, running along base of dorsal fin, and ending below last dorsal ray.

Color when fresh: Body yellowish pink; iris pink; dorsal and anal fins with pink margins; caudal fin pink; pectoral and pelvic fins pale pink. In alcohol, uniformly pale yellow.

Remarks. The present new species differs from *G. surugaensis* in the presence of larger eyes, larger teeth on jaws, more slender caudal peduncle, longer third anal spine and longer caudal fin rays, and in coloration. It differs from *G. laysanus* in the larger eyes, larger teeth on jaws, shape of caudal fin, and coloration.

Etymology. The Latin *macrophthalmus* means large eye.

Acknowledgments

We are grateful to Dr. Takao Igarashi and Dr. Kunio Amaoka of the Laboratory of Marine Zoology, Hokkaido University and Dr. W. D. Anderson, Jr. of the Grice Marine Biological Laboratory, College of Charleston, for their comments on the manuscript. We also give thanks to Dr. Fumio Mitani and Dr. Shinji Kudo of the Nansei Regional Fisheries Research Laboratory and the members of the R/V Kyoyo-Maru No. 2 and R/V Shinsei-Maru No. 53 for the facilities for the collection of *G. macrophthalmus*, sp. nov.

Literature cited

Far Seas Fisheries Research Laboratory, ed. 1972. Colored illustrations of bottomfishes collected by Japanese trawlers. Japanese Deep Sea Trawlers Assoc., Tokyo, v+145 pp.

Gilbert, C. H. 1905. The aquatic resources of Hawaiian Islands. Section II. The deep-sea fishes. Bull. U. S. Fish. Comm., 23 (2): 577～713, figs. 230～276, pls. 66～101.

Gosline, W. A. and V. E. Brock. 1960. Handbook of Hawaiian fishes. Univ. Hawaii Press, Honolulu, ix+372 pp., 277 figs.

Günther, A. 1880. Report on the shore fishes procured during the voyage of H.M.S. "Chal-

lenger" in the years 1872～76. Report on the scientific results of the voyage of H.M.S. "Challenger". Zoology, 1 (6): 1～82, pls. 1～32.
Katayama, M., T. Yamakawa and K. Suzuki. 1980. *Grammatonotus surugaensis*, a new serranid fish from Suruga Bay and the Straits of Osumi, Japan. Biogeogr. Soc. Japan, 35 (4): 45～48, fig. 1.
Norman, J. R. 1957. A draft synopsis of the orders, families and genera of recent fishes and fish-like vertebrates. Brit. Mus. (Nat. Hist.), London, 649 pp.
Tinker, S. W. 1978. Fishes of Hawaii. Hawaiian Service, Inc., Honolulu. xxxx＋532＋xxxvl pp., many figs. and photogr.
Whitley, G. P. 1928. Fishes from the Great Barrier Reef collected by Mr. Melbourne Ward. Rec. Aust. Mus., 16 (6): 294～304, figs, 1～2.

(MK: 2-11-22, Tatara, Hofu 747, Japan; EY: Laboratory of Marine Zoology, Faculty of Fisheries, Hokkaido University, Minato-machi, Hakodate 041, Japan; TY: Kochi Senior High School, Kitabata-cho, Kochi 780, Japan)

Grammatonotus 属（ハタ科）の分類学的検討と新種オオメハナダイの記載

片山正夫・山本栄一・山川　武

Grammatonotus（テンジクハナダイ属，新称）は *Callanthias*（シキシマハナダイ属）と近縁で，ハタ科，シキシマハナダイ亜科に属するが，鰓蓋前骨に1棘があること，前鼻孔が短い管状であること，尾鰭分岐軟条が13本であること，縦列鱗数が少ないことなどでシキシマハナダイ属と異なる．本属は，ハワイ近海産の尾鰭などが破損した *G. laysanus* Gilbert の模式標本（幼魚）が知られているのみであったが，Katayama et al. (1980) は駿河湾，大隅海峡から *G. surugaensis*（テンジクハナダイ）を報告した．更に著者らは天皇海山から *G. laysanus* の状態の良い成魚標本を得，また九州パラオ海嶺から新種 *G. macrophthalmus* オオメハナダイを採集した．これら3種について比較検討を試みた結果，オオメハナダイは眼が大きく，眼径は頭部眼後部より長いことで，同属の他種と区別できる．

（片山：747 防府市多々良 2-11-22；山本：041 函館市港町 3-1-1 北海道大学水産学部；山川：780 高知市北端町　高知高等学校）