

A New Species of the Genus *Guentherus* (Ateleopodiformes: Ateleopodidae) from Japan

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Abstract A new ateleopodid fish, *Guentherus katoi*, is described on the basis of 3 specimens collected from Japan. It is distinguished from *Guentherus altivela*, the only known congener, by having the following characters: no lateral line nor scales vs. a lateral line passing through embedded tubular scales on the lateral side of body in *G. altivela*; smaller head, 25.6–26.0% SL vs. 27.1–35.0% SL; larger orbit, 5.2–6.0% SL vs. 2.4–3.5% SL; shorter upper jaw, 11.7–13.0% SL vs. 13.5–18.6% SL; lower dorsal fin, 20.9–23.9% SL vs. 26.2–32.7% SL; dark brown spots covering the body vs. no spots on the body; tips of first and third free rays of pelvic fin white vs. black.

Key words: New species, Ateleopodidae, *Guentherus katoi*, Japan.

The ateleopodid fishes comprise 4 genera, *Ateleopus* Temminck and Schlegel, 1847, *Guentherus* Osório, 1917, *Ijimaia* Sauter, 1905 and *Parateleopus* Smith and Radcliffe in Radcliffe, 1912 (Nelson, 2006). Of these, the genus *Guentherus* is characterized by having the pelvic fins with 3 free rays followed by normal rays whereas the pelvic fins of other genera are reduced to a single long filament or 1 relatively developed ray plus 0 to 3 rudimentary rays (Howell Rivero, 1935; Paxton, 1986; Smith, 1986).

Osório (1917) described *Guentherus altivela* (the original spelling of the specific name was *Guntherus altivela*) as a new genus and new species on the basis of 4 specimens from the coast of Senegal (the type specimens were lost by fire in 1978 [Costa and Quéro, 1990]). The original spelling of the new generic name was *Güntherus*, Walters (1963) emended it to *Guentherus* (see ICZN, Art. 32.5.2.1). He also emended the specific name, *altivela*, to *altivelis*, but it

should not be corrected as discussed by Bussing and López (1977). Osório (1917) established also the new family Guntheridae (the original spelling was Guntheridae) for his new genus and new species, but it is considered to be a synonym of Ateleopodidae by Walters (1963) and many other authors. Trunov and Isarev (1970) reported 3 additional specimens of *G. altivela* from the southeastern Atlantic.

Barnard (1941) described briefly *Melanogloea ventralis* as a new genus and new species on the basis of a single specimen from the Atlantic coast of South Africa. This specimen was re-described in detail by Barnard (1948). Cadenat (1960) recorded a large specimen (815 mm in total length) of this species from the coast of Senegal.

Cervigón (1961) described *Anodontus mauritanicus* as new genus and new species on the basis of 3 specimens from Mauritania. da Franca and Lorete-Ferreira (1967) compared 3 speci-

mens of *M. ventralis* from the coast of Angola with *A. mauritanicus* and concluded that they were conspecific.

Penrith (1969) reported 4 additional specimens of *G. altivela* from southwest Africa. He regarded *M. ventralis* and *A. mauritanicus* as synonyms of *G. altivela* without comment. Costa and Reiner (1977) reported for the first time a specimen of *G. altivela* from off Portugal, the northeastern Atlantic. They compared it with 2 syntypes of *G. altivela* (they stated that Osório's specimens are the holotype and one of paratypes, but the type specimens have never been so designated) and morphological data in many previous reports. The comparisons led them to conclude that *Guentherus* consists of a single species that is widely distributed in the eastern Pacific. Furthermore, Bussing and López (1977) found *G. altivela* from the eastern Pacific. They examined many specimens from the Pacific and the Atlantic, and considered that both populations were conspecific. Thus, the genus *Guentherus* is represented only by *G. altivela* (see a synonym list in Costa and Quéro, 1990 and Tortonese and Hureau, 1979).

We recently obtained three large specimens of unidentified atelepodid fishes from Japan. One of them was collected by a trawl boat at depths of 319.5–352.5 m off the Kumanonada Sea, southern Japan on 2 February 2006. The other 2 specimens were drawn into a pipe that pumps seawater at the Okinawa Prefectural Deep Sea Water Research Center from a depth of 612 m off Kumejima Island, the Ryukyu Islands on 26 May 2003 and 28 April 2006. These specimens were promptly identified as the second species of *Guentherus* because they have the characteristic pelvic fins as mentioned above. The collection localities are far apart from the previously known range of the genus. The 3 specimens from Japan are different from the only known species *G. altivela* in important morphological characters (see below). We describe them herein as a new species *G. katoi*.

Methods of counts and measurements followed Hubbs and Lagler (1964) unless otherwise stated.

All measurements were made to the nearest 0.1 mm with a vernier calliper. Standard length is abbreviated as SL throughout the text. Vertebrae were counted from soft X-ray negatives. The type specimens are deposited in the Kanagawa Prefectural Museum of Natural History (KPM) and the National Museum of Nature and Science, Tokyo (NSMT). Images of the type specimens were recorded in the Image Database of Fishes in the Kanagawa Prefectural Museum of Natural History (KPM-NR).

***Guentherus katoi* sp. nov.**

(New Japanese name: Hyomon-shachiburi)

(Figs. 1–3; Table 1)

Holotype. KPM-NI 16647, 643.7 mm SL, off Mie-shima Island, the Kumanonada Sea (34°06'16.8"N to 34°06'45.6"N; 136°33'58.2"E to 136°34'42.0"E), trawled at depths of 319.5–352.5 m by Seiryomaru, 2 February 2006.

Paratypes. KPM-NI 16810, 694.2 mm SL, off 2.3 km from Maja, Kume-jima Island, Ryukyu Islands, pumped up from a depth of 612 m together with seawater, 28 April 2006; NSMT-P 78774 (formerly KPM-NI 16809), 567.1 mm SL, collected by same method as KPM-NI 16810, 26 May 2003.

Diagnosis. No lateral line nor scales on body; head length 25.6–26.0% SL; diameter of orbit 5.2–6.0% SL; length of upper jaw 11.7–13.0% SL; length of dorsal fin 20.9–23.9% SL; many dark brown spots on body; tips of first and third free rays of pelvic fins lanceolate and white.

Description. Counts and proportional measurements are shown in Table 1. Head and body covered by spongy connective tissue and very thin skin. Body moderately elongate and well compressed; belly rounded. Head slightly compressed. Snout somewhat pointed. Narial openings are simple pores, anterior one smaller than the posterior one; both pores located near anterior margin of eye. Mouth subterminal, gape nearly horizontal. Upper jaw well projecting beyond lower jaw. Maxilla reaching just below a vertical through posterior margin of pupil. No teeth on jaws and oral cavity. Gill opening wide, free from isthmus, reaching to a vertical through center of

pupil. Gill rakers on left first gill arch slender, becoming gradually shorter anteriorly; some anterior gill rakers with a swelled tip; longest gill raker 8.4–9.4% in head length, nearly equal to longest gill filament (8.5–10.2% in head length) in length. Lateral line and scales absent.

Dorsal fin somewhat pointed. Anal fin confluent with caudal fin; outer margin of the posterior half of the anal fin to posterior margin of the caudal fin gently rounded. Pectoral fins pointed. Pelvic fins thoracic, with 3 free rays followed by normal rays (Fig. 3); first free ray rod-like with a



Fig. 1. *Guentherus kato* sp. nov., freshly dead specimen, KPM-NI 16647, holotype, 643.7 mm SL, Kumanonada Sea. Photographed by S. Kuwayama.

large lanceolate tip; second one thin and filament-like; third one rod-like, but thinner than the first with a small lanceolate tip. A low gelatinous adipose fin arising behind dorsal fin, and terminating at base of caudal fin as a thin flap.

Coloration in fresh specimens (Figs. 1–2). Head and body pale pink, covered with many reddish to dark brown spots on nape to the lateral side of body; these spots showing great variation in shape and size, resembling a leopard's spots; isthmus to thorax with many small light grayish brown spots, the pale interspaces forming fine reticulations. Lips light brown, upper edge of upper lip and maxilla white. Oral and gill cavities white, with a light brown patch on the inner side of opercular bones. Dorsal fin reddish brown in lower half, blackish distally; some small dark brown spots on the basal part of dorsal fin. Anal and caudal fins reddish brown, blackish distally in the anterior half of the anal fin; blackish part of anal fin becoming wider posteriorly, caudal fin almost blackish. Pectoral fins reddish brown, blackish distally, and grayish in the lower part. Pelvic fins blackish except for 3 white, free rays.

Coloration in preserved specimens. Reddish color disappeared; most parts of head, body and fins dark; spots on body barely recognized.



Fig. 2. *Guentherus kato* sp. nov., thawed out specimen, KPM-NI 16647, holotype, 643.7 mm SL, Kumanonada Sea. Photographed by H. Senou.

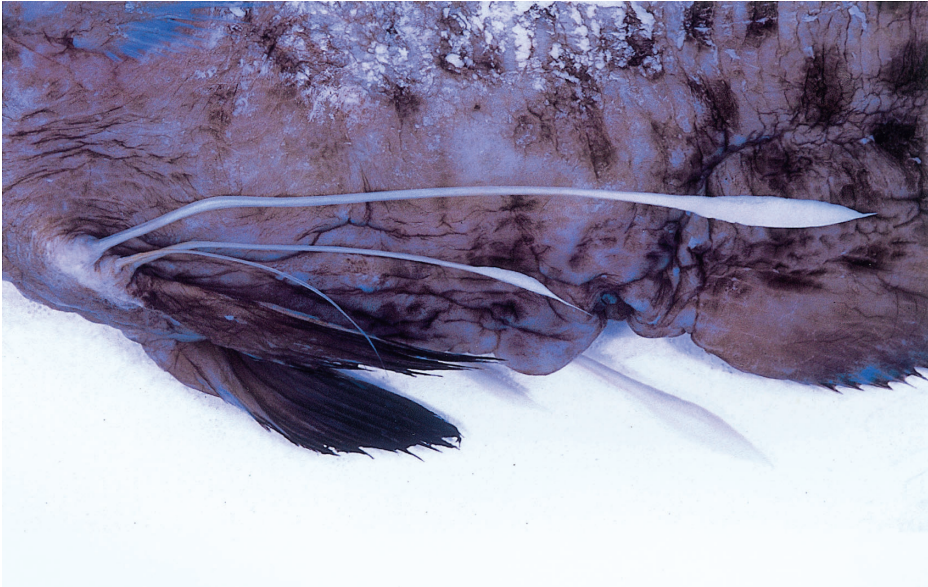


Fig. 3. *Guentherus katoi* sp. nov., pelvic fin, thawed out specimen, KPM-NI 16647, holotype, 643.7 mm SL, Kumanonada Sea. Photographed by H. Senou.

Distribution. Known only from Kume-jima Island, the Ryukyu Islands and the Kumanonada Sea, southern Japan.

Remarks. *Guentherus katoi* is easily distinguishable from *G. altivela* by the absence of a lateral line and scales on body. Barnard (1948) provided 3 illustrations of a lateral-line scale taken from the holotype (680 mm in total length) of *Melanogloea ventralis* (a synonym of *G. altivela*). Smith (1986) stated that the lateral line is straight and consists of a series of about 35 small pores from the gill opening to the caudal base. The lateral line can be recognized in some illustrations and even in photographs in the previous publications (Cervigón, 1961: fig. 3; Bussing and López, 1977: figs 2 and 3; Maurin *et al.*, 1977: fig. 50; Smith, 1986: fig. 124.3). However, in our specimens, the skin on body is completely smooth, and we do not recognize any structure such as a lateral line or pores.

Our new species has prominent markings resembling a leopard's spots on body (Figs. 1 and 2), and a white lanceolate tip of the first and third free rays of the pelvic fin (Fig. 3). Conversely, in *G. altivela*, the body is uniformly light to dark

brown, and both lanceolate tips of the first and third free rays of the pelvic fin are jet black in the specimens larger than at least 480 mm in total length (da Franca and Lorete-Ferreira, 1967: figs. 1, 2 and 4; Maurin *et al.*, 1977: fig. 50; Smith, 1986: fig. 124.3). Barnard (1948) also stated the first and third rays in his specimen mentioned above are jet black. In specimens of *G. altivela* that are 300–350 mm in total length, the tip of the first free ray only is black (Cervigón, 1961: fig. 3; da Franca and Lorete-Ferreira, 1967: fig. 3; Costa and Reiner, 1977: fig. 2).

Bussing and López (1977) compared counts and measurements of the eastern Pacific specimens of *G. altivela* with the eastern Atlantic ones. In addition, Costa and Reiner (1977) gave counts and measurements for three specimens including 2 syntypes of *G. altivela*. In comparison with the data of specimens (268.8–476.0 mm in SL of Bussing and López (1977) and/or those (318–478 mm in SL) of Costa and Reiner (1977), our specimens are different in the head length (25.6–26.0% in SL vs. 26.4–35.0% in SL), diameter of orbit (5.2–6.0 vs. 2.4–3.5), length of upper jaw (11.7–13.0 vs. 13.5–18.6) and height of

Table 1. Counts and measurements of *Guentherus katoti* sp. nov.

	KPM-NI 16647 Holotype Kumanonada Sea	NSMT-P 78774 Paratype Kume-jima I.	KPM-NI 16810 Paratype Kume-jima I.	Present study Japan	Bussing & López (1977) Eastern Pacific	Atlantic	Costa & Reiner (1977) including two of four syntypes of <i>G. altivela</i> Atlantic
Dorsal-fin rays	n=1 11	n=1 11	n=1 12+1=13	n=3 11-13	n=13 11-13	n=9-13 11-13	n=3 11-13
Pectoral-fin rays (left/right)	14/14	15/14	15/15	14-15	12-14	12-14	14
Pelvic-fin rays (left/right)	3+7=10/ 3+7=10	3+8=11/ 3+8=11	3+?=10/ 3+7=10	10-11	9-10	10	10
Anal-fin rays	78	76	77	76-78	70-79	77-83	75-79
Branched caudal-fin rays	6+5=11	6+5=11	6+5=11	11	9-11	9-11	10-11
Gill rakers on first arch (left/right)	5+17=22/ 5+17=22	6+18=24/ ?+18=?	5+17=22/ 5+17=22	5-6+17-18= 22-24	4-6+18-22= 23-27	5-6+16-19= 21-24	5-6+18= 23-24
Total vertebrae	80	89	90	80-90	78 & 80 (n=2)	77 (n=1)	-
Standard length (SL, mm)	643.7 (n=1)	567.1 (n=1)	694.2 (n=1)	567.1-694.2 (n=2-3)	304.0-370.8 (n=7)	268.8-476.0 (n=4)	318.0-478.0 (n=3)
Morphometrics (%SL)							
Head length	26.0	26.0	25.6	25.6-26.0	33.8-35.0	26.4-33.5	27.1-32.1
Snout length	8.9	7.8	8.2	7.8-8.9	-	-	8.1-13.2
Diameter of orbit	5.6	5.2	6.0	5.2-6.0	2.9-3.5	2.4-3.3	-
Least width of bony interorbital	4.4	3.4	3.9	3.4-4.4	-	-	-
Length of upper jaw including soft tissue	13.0	11.7	13.0	11.7-13.0	17.3-18.6	13.5-17.0	-
Predorsal length	38.1	36.3	38.6	36.3-38.6	39.2-45.4	35.9-40.6	-
Preal length	58.2	56.0	57.6	56.0-58.2	53.9-62.7	49.7-57.8	61.9-66.9
Body depth at pelvic-fin insertion	26.9	24.1	29.3	24.1-29.3	-	-	-
Body depth at anus	26.6	22.4	21.9	21.9-26.6	-	-	-
Greatest width of head	13.8	-	14.3	13.8-14.3	-	-	-
Height of dorsal fin	23.9	22.6	20.9	20.9-23.9	26.2-28.6	28.5-32.7	-
Length of dorsal-fin base	8.9	8.8	9.1	8.8-9.1	-	-	-
Length of pectoral fin	25.4	23.1	22.8	22.8-25.4	22.1-24.4	19.8-23.8	-
Length of pectoral-fin base	5.1	4.7	5.3	4.7-5.3	-	-	-
Length of first pelvic-fin ray	31.4	32.2	31.9	31.4-32.2	30.4-37.8	24.4-30.2	23.3-26.4
Length of second pelvic-fin ray	12.8	13.6	13.5	12.8-13.6	-	-	-
Length of third pelvic-fin ray	18.9	18.2	17.9	17.9-18.9	-	-	-
Length of pelvic fin except free rays	15.0	12.6	13.6	12.6-15.0	17.4-18.0	14.4-17.3	-
Length of longest anal-fin ray	17.4	13.8	13.1	13.1-17.4	-	-	-
Length of anal-fin base	46.9	48.8	44.1	44.1-48.8	39.4-47.2	48.4-51.0	-
Length of longest caudal-fin ray	12.5	10.8	10.2	10.2-12.5	12.2-12.9	10.7-12.8	-

dorsal fin (20.9–23.9 vs. 26.2–32.7) (Table 1). There is no significant difference between our new species and *G. altivela* in the counts.

Etymology. The new species is named after Mr. Tatsuya Kato who collected the holotype.

Acknowledgments

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Literature Cited

- Barnard, K. H. 1941. Department of fishes and marine invertebrates. *Report of the South African Museum for 1940*: 10–11, with a pl.
- Barnard, K. H. 1948. Further notes on South African marine fishes. *Annals of the South African Museum*, 36: 341–406, pls. 9–13.
- Bussing, W. A. and S. M. I. López. 1977. *Güntherus altivela* Osório, the first ateleopodid fish reported from the eastern Pacific Ocean. *Revista de Biología Tropical*, 25(2): 179–190.
- Cadenat, J. 1960. Notes d’Ichtyologie ouest-africaine XXXI. Sur la présence d’un Ateleopidae, *Melanogloea ventralis* Barnard 1941 (?) sur les côtes du Sénégal. *Bulletin de l’Institut Français d’Afrique Noire*, 22, Ser. A, (4): 1424–1426, pl. 1.
- Cervigón, F. 1961. Descripción de *Anodontus mauritanicus* nov. gen. nov. sp. (orden Ateleopiformes) y *Cottunculus costae-canariae* nov. sp. (familia Cottidae) de las costas occidentales de Africa. *Investigación pesquera*, 19: 119–128.
- Costa, M. J. and J. C. Quéro. 1990. Ateleopodidae. Pages 644–645 in J. C. Quéro, J. C. Hureau, C. Karrer, A. Post and L. Saldanha, eds. Check-list of the fishes of the eastern tropical Atlantic. Vol. 2. JNICT, Lisbon.
- Costa, M. J. and F. Reiner. 1977. *Güntherus altivela* Osório, 1917 (Pisces; Ateleopodidae), a new fish to the northeastern Atlantic. *Arquivos do Museu Bocage*, Ser. 2, 6: 1–6, with a pl.
- da Franca, P. and M. Lorete-Ferreira. 1967. Contribuição para o conhecimento dos Ateleopidae do Atlântico Oriental Africano. *Notas mimeografadas do Centro de Biologia aquatica tropical, Lisboa*, (5): 1–24 with 7 pls.
- Howell Rivero, L. 1935. The family Ateleopidae and its West Indian form. *Memorias de la Sociedad Cubana de Historia Natural*, 9(2): 91–106, pl. 8.
- Hubbs, C. L. and K. F. Lagler. 1964. Fishes of the Great Lakes Region. University of Michigan Press, Ann Arbor, xv+213 pp., 44 col. pls.
- Maurin, C., M. Bonnet and J.-C. Quéro. 1977. Poissons des cotes nord-ouest africaines (Campagnes de la “Thalassa” 1962, 1968, 1971 et 1973), clupéiformes, scopéiformes et cetomimiformes. *Revue travaux de l’Institut des Pêches maritimes*, 41(1): 5–92.
- Nelson, J. S. 2006. Fishes of the world. Fourth edition. John Wiley & Sons, Inc., New Jersey, xix+601 pp.
- Osório, B. 1917. Nota sobre algumas espécies de peixes que vivem no Atlântico ocidental. *Arquivos da Universidade de Lisboa*, 4: 103–131, pls. 29–36.
- Paxton, J. R. 1986. Ateleopodidae. Pages 528–529 in P. J. P. Whitehead, M.-L. Bauchot, J.-C. Hureau, J. Nielsen and E. Tortonese, eds. Fishes of the north-eastern Atlantic and the Mediterranean. UNESCO, Paris.
- Penrith, M. J. 1969. New records of deep-water fishes from South West Africa. *Cimbebasia*, Ser. A, 1(3): 59–75.
- Radcliffe, L. 1912. Descriptions of a new family, two new genera, and twenty-nine new species of anacanthine fishes from the Philippine Islands and contiguous waters. *Proceedings of the United States National Museum*, 43(1924): 105–140, pls. 22–31.
- Sauter, H. 1905. Notes from the Owston collection. I. A new ateleopodid fish from the Sagami Sea (*Ijimaia dofleini* n. sp.). *Annotationes Zoologicae Japonenses*, 5(4): 233–238.
- Smith, M. M. 1986. Ateleopodidae. Pages 404–406 in M. M. Smith and P. C. Heemstra, eds. Smiths’ sea fishes. Macmillan South Africa, Johannesburg.
- Temminck, J. C. and H. Schlegel. 1847. Pisces. Part 14. Pages 248–268, pls. 110–118 in Ph. von Siebold. Fauna Japonica. Lugduni, Batavorum. (See p. 1652 of “T. Nakabo, ed., 2002. Fishes of Japan with pictorial keys to the species, English edition II, Tokai University Press” on the date of publication and pagination.)
- Tortonese, E. and J.-C. Hureau. 1979. Supplément au Clofnam (Catalogue des poissons du nord-est Atlantique et de la Méditerranée: Check-list of the fishes of the north-eastern Atlantic and of the Mediterranean).

Cybium, 3(5): 331–394.

Trunov, I. A. and A. T. Isarev. 1970. *Güntherus altivela* Osório, 1917 (fam. Ateleopidae) from the southeastern Atlantic. *Journal of Ichthyology*, 11(1): 115–117.

Walters, V. 1963. On two hitherto overlooked teleost families: Guentheridae (Ateleopodiformes) and Radicephal-

idae (Lampridiformes). *Copeia*, 1963(2): 455–457.

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