

Report on specimens of Peristediidae (Teleostei) deposited in the Department of Zoology, the University Museum, the University of Tokyo

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Abstract

The collection of Peristediidae (Teleostei) held in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT) includes 97 specimens representing four genera and eight species, most of which were collected in the early 20th century, but does not include type specimens of any nominal species in the family. Early 20th century distributions of the eight species in Japanese waters, as judged from these specimens, did not differ significantly from current distributions except doubtful records. A single specimen of *Satyrichthys rieffeli* (Kaup, 1859) from Ariake Sound, western Kyushu, Japan represents the first record of the species from the Sound.

Introduction

The armored searobin family Peristediidae Jordan & Gilbert, 1882 (Teleostei), currently represented by six valid genera and 45 valid species in tropical to temperate waters on lower continental shelves and upper continental slopes in depths of 50–1,324 m (Miller, 1967; Blanc and Hureau 1973; Miller and Richards 1990, 2003; Richards 1999; Kawai et al. 2004a, b, 2008; Kawai 2008, 2011, 2013, 2014, 2016, 2019; Bussing, 2010; Tenda and Kawai 2012; Ho et al. 2013; Ono and Kawai 2014; Richards and Miller 2016; Fricke et al. 2017; Higuchi and Kawai 2020), is characterized by the following characters: body encased in large bony plates as well as by possession of a rostral projection; pectoral fins with two free lower soft rays; large barbels present on lower jaw (Nelson 2006). All species are benthic, apparently using their free pectoral-fin rays and rostral projection to detect buried prey (Fricke et al. 2017).

During management of the fish collection in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT), 97 specimens were identified by the first author as belonging to the family Peristediidae. They are listed below with distributional notes.

Materials and Methods

Identifications of the peristediid specimens in ZUMT were confirmed by reference to Kawai (2008, 2013, 2016, 2019), Kawai et al. (2008), and Fricke et al. (2017). Standard lengths

(SL) were measured for all specimens (arranged herein in alphabetical order by species) following the method of Kawai et al. (2004a). Collector's name and affiliation are given where known (from ZUMT specimen catalog or tag), with Japanese language equivalents in parentheses. The collection year and collector for some specimens was estimated by following Koeda et al. (2022). The following list includes ZUMT number, SL, number of specimens in parentheses when two or more, collection locality, collection depth, collection date, collecting method, collector or donator and affiliation, and remarks when applicable. Catalog numbers after ZUMT 62000 were newly given during this study.

Collection of Peristediidae in ZUMT

Four genera and eight species of the family Peristediidae are represented by 97 specimens held in ZUMT, there being no type specimens of any nominal species. Specimens were collected from 1899 to 1983, mainly in the early 20th Century, many from waters off Kanagawa to Kochi Prefectures on the Pacific coast of Japan. None had been these species, unfamiliar to Japan in the early 20th Century for the same reason as species in the family Setarchidae, were not given specific local names (see Wada et al. 2022). Most specimens from Suruga and Tosa bays were identified as *Peristedion orientale* Temminck & Schlegel, 1843 or *Scaliscus hians* (Gilbert & Cramer, 1897) the two species most commonly caught by bottom trawl in deepwater areas off temperate Japan (Kamohara 1952; Ono and Kawai 2014; Ikeda and Nakabo 2015; Kawai 2019). The distribution of peristediid species in Japan in the early 20th century, indicated by the ZUMT specimens, did not differ significantly from their current distributions (Kawai 2011, 2013, 2014, 2016, 2019; Yamada and Yagishita 2013; Ono and Kawai 2014).

Peristediidae キホウボウ科

Gargariscus Smith, 1917 オニキホウボウ属

Gargariscus prionocephalus (Duméril, 1869) オニキホウボウ

ZUMT 34733: 128.3 mm SL, Suruga Bay, off Numazu, Shizuoka Pref., Japan, donated by S. Yamamoto (Numazu Junior High School) [山本末吉 (沼津中学校).]

Peristedion Lacepède, 1801 キホウボウ属

Peristedion liorhynchus (Günther, 1872) モヨウキホウボウ

ZUMT 20218: 206.2 mm SL, Wakayama Pref. Japan, Jan. 1920, N. Ui (宇井縫蔵).

ZUMT 20356: 194.6 mm SL, Kisyu-tanabe, Wakayama Pref., Japan, collection date unknown (before 9 Sept. 1921), N. Ui.

ZUMT 47222: 73.3 mm SL; **ZUMT 47224:** 79.6 mm SL, probably Tosa Bay, Kochi Pref., Japan, T. Kamohara (Kochi Senior High School) [蒲原稔治 (高知高等学校)].

Peristedion orientale Temminck & Schlegel, 1843 キホウボウ

- ZUMT 2773:** 128.4 mm SL, Nagasaki Pref. Japan, Apr. 1910, donation from Nagasaki Prefecture Normal School (長崎師範学校寄贈).
- ZUMT 5430:** more than 50.6 mm SL (caudal peduncle broken), Tokyo (details unknown), Japan, 14 Dec. 1899, donated by A. Owston.
- ZUMT 18255:** 144.3 mm SL; **ZUMT 18256:** 132.3 mm SL, Enshu-nada Sea, off Maisaka, Hamamatsu, Shizuoka Pref., Japan, S. Ooe (Shizuoka Prefectural Hamamatsu Girls' Senior High School) [大恵尚一 (静岡県浜松高等女学校)].
- ZUMT 18984:** 118.4 mm SL, Tosa Bay, Kannoura (currently Toyo Town), Kochi Pref., Japan, 3 Apr. 1929, T. Kamohara.
- ZUMT 23161:** 163.5 mm SL, Kumano-nada Sea, Motoki, Kumano, Mie Pref., Japan, Feb. 1921, collected by Y. Tsuchiga (Head Teacher at Kimoto Junior High School) [樋賀安平 (三重県南牟婁郡木本町木本中学校校長)], donated by T. Koide (小出哲夫).
- ZUMT 23645:** 74.8 mm SL, Tosa Bay, Urado, Kochi, Kochi Pref., Japan, 10 Apr. 1931, T. Kamohara.
- ZUMT 23820:** 111.0 mm SL; **ZUMT 23821:** 173.9 mm SL; **ZUMT 23822:** 137.6 mm SL, probably Kagoshima Bay, Naya, Kagoshima, Kagoshima Pref. Japan.
- ZUMT 24245:** 88.9 mm SL, **ZUMT 24246:** 151.1 mm SL, **ZUMT 24247:** 73.9 mm SL, Tosa Bay, Mimase, Kochi, Kochi Pref., Japan, 15 Jan. 1932, T. Kamohara.
- ZUMT 24296:** 145.2 mm SL, Tosa Bay, Mimase, Kochi, Kochi Pref., Japan, 2 Nov. 1931, T. Kamohara.
- ZUMT 25355:** 117.9 mm SL, south of Shima, Mie Pref., Japan (landed at Toyohama Fish Market, Aichi Pref., Japan), about 300–360 m depth (200 尋), 31 Mar. 1933, S. Yoshikane (Aichi Prefectural Girl's Normal School) [吉兼宗一 (愛知県女子師範学校)], purchased at Toyohama Fish Market, Aichi Pref., Japan.
- ZUMT 26932:** 149.1 mm SL, Kagoshima Pref. Japan.
- ZUMT 34597:** 70.6 mm SL; **ZUMT 34598:** 82.8 mm SL; **ZUMT 46971:** 169.7 mm SL; **ZUMT 46972:** 164.5 mm SL; **ZUMT 47193:** 74.9 mm SL; **ZUMT 47207:** 67.9 mm SL; **ZUMT 47223:** 80.2 mm SL, probably Tosa Bay, Kochi Pref., Japan, T. Kamohara.
- ZUMT 40323:** 150.4 mm SL, Enshu-nada Sea, off Maisaka, Hamamatsu, Shizuoka Pref., Japan, S. Ooe.
- ZUMT 46967:** 134.7 mm SL, Tokyo Market (details unknown), T. Kamohara.
- ZUMT 49963:** more than 132.4 mm SL (caudal peduncle broken), East China Sea, Fukue-jima I., Goto Is., Nagasaki Pref. Japan, 10 June 1953, I. Tomiyama (富山一郎), who had requested specimens from the Fukue-cho Fish. Corp. [福江町漁業共同組合 (五島列島福江島福江町)].
- ZUMT 53502:** 94.9 mm SL, locality and date unknown, T. Sato (佐藤寅雄).
- Remarks: The collection locality of this specimen is described in the ZUMT specimen ledger as “石垣島 (Ishigaki-jima I., Yaeyama Is., Ryukyu Archipelago, Okinawa Pref., Japan)”. However, for the same reason as for ZUMT 53349 (*Pempheris japonica* Döderlein, 1883), this locality is doubtful (see Koeda et al. 2022: p. 6). The specimens collected by T. Sato registered in ZUMT 53000–54000 were probably collected in the temperate waters of

Japan, but it is very likely that the data for the localities were accidentally replaced by data for specimens from Ishigaki-jima Island.

ZUMT 54686: 105.0 mm SL; **ZUMT 54687:** 120.1 mm SL; **ZUMT 54688:** 108.4 mm SL; **ZUMT 54689:** 122.3 mm SL; **ZUMT 54690:** 100.2 mm SL; **ZUMT 54691:** 95.3 mm SL, Suruga Bay, off Mt. Kuno, Shizuoka, Shizuoka Pref., Japan, 9 May 1983, bottom trawl, M. Aizawa (藍澤正宏).
ZUMT 62478: 129.3 mm SL; **ZUMT 63771:** 93.6 mm SL, no data.

Peristedion riversandersoni (Alcock, 1894) ヘリキホウボウ

ZUMT 33228: 80.3 mm SL, near Taraika (currently Poronaysk), Sakhalin Island (doubtful), K. Sakamoto (Hamamatsu Second Junior High School) [坂本喜一 (浜松第二中学校)].
Remarks: Although the specimen locality was noted as "樺太多来加付近 (near Taraika, Sakhalin)" in the ZUMT ledger, such is questionable since the current northernmost record of *P. riversandersoni* is off Iwate Prefecture, Japan, there being no records from Hokkaido Island (located between Iwate Prefecture and Sakhalin Island) (Wada et al. 2020). Since peristediid fishes have been commonly collected by bottom trawl off Hamamatsu (hometown of the collector), Shizuoka Prefecture, Japan, ZUMT 33228 was possibly also collected there.

Satyrichthys Kaup, 1873 イソキホウボウ属
Satyrichthys rieffeli (Kaup, 1859) イソキホウボウ

ZUMT 17688: more than 117.2 mm SL (caudal peduncle broken), Ariake Sound (details unknown), western Kyushu, Japan, May 1927, S. Koyanagi (Higashiyoka Jinjo Elementary School) [小柳佐八 (佐賀県佐賀郡東与賀尋常小学校)].
Remark: Sahachi Koyanagi (1893–1980), an elementary and junior high school teacher in Saga Prefecture, conducted research on the marine fauna of Ariake Sound and the local history of his hometown (Morotomi Town History Compilation Committee 1984). He donated several specimens requiring identification to ZUMT during his survey, but did not include reference to them in his published report because he did not list-up the specimens in the process of being identified (Koyanagi 1931). In the East China Sea, adjacent to Ariake Sound, *Sa. rieffeli* is mainly distributed in depths of 100–200 m (Yamada et al. 2007). Although Ariake Sound is a shallow inland sea with an average depth of 20 m, the area immediately connected to the East China Sea is relatively deep (maximum depth 165 m) (Kamata 1979), with records of the deepwater benthic fish species including *Gnathophis heterognathos* (Bleeker, 1858) (Congridae), *Scorpaena onaria* Jordan & Snyder, 1900 (Scorpaenidae), and *Acanthocephala krusensternii* (Temminck & Schlegel, 1845) (Cepolidae) (Kikuchi 1970; Motomura 2020). This specimen may have also been collected from that area. Because there have been no previous records of *Sa. rieffeli* from Ariake Sound (Koyanagi 1931; Uchida and Tsukahara 1955; Kikuchi 1970; Washio et al. 1996;

Yamada and Yagishita 2013), the specimen is recognized as the first record of the species from the Sound.

ZUMT 19624: 225.1 mm SL; **ZUMT 19625**: 226.5 mm SL, Tokyo Market (transported from the Kansai region).

ZUMT 21140: 231.4 mm SL, nearest sea of Mie Pref., Japan, purchased at local fish store.

ZUMT 24305: 75.1 mm SL, Tosa Bay, off Mimase, Kochi, Kochi Pref., Japan, 20 Nov. 1931, T. Kamohara.

ZUMT 62510 (paper tag P-4120): 185.3 mm SL; **ZUMT 62511** (paper tag P-4121): 193.7 mm SL, probably around Sarawak, Borneo, collection date unknown (before 1960), donated in 1960 by Tom Harrison (Sarawak Museum) to I. Tomiyama.

Scalicus Jordan, 1923 ヒゲキホウボウ属

Scalicus hians (Gilbert & Cramer, 1897) ヒゲキホウボウ

ZUMT 16686: 130.0 mm SL, Suruga Bay, off Toi, Shizuoka, Shizuoka Pref., Japan, S. Suguro (Toi, Takata, Shizuoka Pref. Japan) [勝呂正平 (静岡県田方郡土肥村)].

ZUMT 18284: 134.7 mm SL, Enshu-nada Sea, off Maisaka, Hamamatsu, Shizuoka Pref., Japan, S. Ooe.

ZUMT 19560: 111.5 mm SL, Tosa Bay, off Kochi, Kochi Prefecture, Japan, 8 June 1929, T. Kamohara.

ZUMT 26355: 133.5 mm SL, Sagami Bay, off Odawara, Kanagawa Pref., Japan, Apr. 1925, set net (大謀網), T. Fujita (Fishery School student) [藤田 正 (水産講習所生徒)].

ZUMT 31657: 144.9 mm SL, locality unknown (probably off Ibaraki Pref. Japan), K. Tashiro (Managing Director, Ibaraki Prefectural Fisheries Experimental Station) [田代清友氏寄贈 (茨城県水産試験場長)].

ZUMT 33229: 158.5 mm SL; **ZUMT 33230**: 173.0 mm SL, near Patience, Sakhalin (doubtful), K. Sakamoto.

Remarks: As for ZUMT 33228 (*Peristedion riversandersoni*), the locality given for the two specimens is doubtful. Currently, the northernmost record of *S. hians* is off Kuji, Iwate Prefecture, Japan (Kawai et al. 2003; Kawai 2019).

ZUMT 33686: 127.7 mm SL; **ZUMT 33687**: 122.3 mm SL, Enshu-nada Sea, off Maisaka, Hamamatsu, Shizuoka Pref., Japan, S. Ooe.

ZUMT 33911: 166.1 mm SL; **ZUMT 33912**: 171.9 mm SL, locality unknown (probably off coast of Aichi Pref. Japan), Aichi Prefectural Fisheries Experimental Station (Osaki, Toyohashi, Aichi Pref., Japan) [愛知県水産試験場 (豊橋市大崎町)].

ZUMT 33970: 181.4 mm SL; **ZUMT 33971**: 117.7 mm SL; **ZUMT 33972**: 93.4 mm SL, localities unknown (probably off coast of Shizuoka Pref. Japan), donated by N. Ishiuchi (Hamamatsu Normal School) [石内直太郎 (浜松師範学校)].

ZUMT 39321: 175.5 mm SL; **ZUMT 39325**: 160.4 mm SL; **ZUMT 62479**: 172.9 mm SL, no data.

ZUMT 42400: 84.1 mm SL; **ZUMT 42401:** 114.9 mm SL, Suruga Bay, off Shimoda, Shizuoka Pref., Japan, K. Kato (Mitsui Institute of Marine Biology: MIMB) [加藤光次郎 (三井海洋生物研究所)].

ZUMT 47146: 141.5 mm SL, probably Tosa Bay, Kochi Pref., Japan.

ZUMT 62480 (previously registered as MIMB 4981): 115.2 mm SL, Sagami Bay, off Kawatsu, Kamo, Shizuoka Pref. Japan, donation from MIMB.

ZUMT 62452: 117.6 mm SL; **ZUMT 62453:** 125.4 mm SL (eye with parasitic copepod);
ZUMT 62454: 115.8 mm SL; **ZUMT 62455:** 122.7 mm SL; **ZUMT 62456:** 82.4 mm SL;
ZUMT 62457: 78.1 mm SL; **ZUMT 62458:** 81.4 mm SL; **ZUMT 62459:** 89.5 mm SL;
ZUMT 62460: 72.1 mm SL; **ZUMT 62461:** 64.5 mm SL; **ZUMT 62462:** 71.9 mm SL;
ZUMT 62463: 74.3 mm SL; **ZUMT 62464:** 71.9 mm SL; **ZUMT 62465:** 90.3 mm SL;
ZUMT 62466: 82.6 mm SL; **ZUMT 62467:** 72.9 mm SL; **ZUMT 62468:** 83.2 mm SL;
ZUMT 62469: 74.4 mm SL; **ZUMT 62470:** 110.7 mm SL; **ZUMT 62471:** 88.7 mm SL;
ZUMT 62472: 68.2 mm SL; **ZUMT 62473:** 88.3 mm SL; **ZUMT 62474:** 91.6 mm SL;
ZUMT 62475: 77.6 mm SL, Suruga Bay, off Heda, Numazu, Shizuoka Pref., Japan, Dec. 1936, donation from MIMB.

Scalicus quadratorostratus (Fourmanoir & Rivaton, 1979) ソコキホウボウ

ZUMT 34708: 152.1 mm SL, locality and date unknown.

ZUMT 62476: 109.1 mm SL, Suruga Bay, off Heda, Numazu, Shizuoka Pref., Japan, Dec. 1936, donation from MIMB.

Scalicus serrulatus (Alcock, 1898) トゲキホウボウ

ZUMT 34709: 142.9 mm SL; **ZUMT 55357:** 75.3 mm SL, no data.

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Figure 1. Dorsal view of preserved specimen of *Satyrichthys rieffeli* from Ariake Sound, western Kyushu, Japan (ZUMT 17688, ca. 117.2 mm SL).