

Specimens of the family Kyphosidae (Teleostei: Perciformes: Percoidei) deposited in the Department of Zoology, The University Museum, The University of Tokyo

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Abstract

Specimens of the family Kyphosidae (Teleostei: Perciformes: Percoidei) in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT) were examined and found to represent one genus and four species as follows: *Kyphosus bigibbus* (Lacepède, 1801); *Kyphosus cinerascens* (Forsskål, 1775); *Kyphosus pacificus* Sakai & Nakabo, 2004; *Kyphosus vaigiensis* (Quoy & Gaimard, 1825). Additionally, the collection includes one of the seven paratypes of *K. pacificus*.

Introduction

The seachub family Kyphosidae (Teleostei: Perciformes: Percoidei) occurs worldwide in tropical and temperate seas, with most of species inhabiting shallow reefs and feeding primarily on macroalgae in adult (Sakai 2001; Knudsen and Clements 2013). Within this family, there exist diverse views regarding the recognition of subfamilies, genera, and species. However, since the publication of the revision of this family by Knudsen and Clements (2013), it has commonly been acknowledged as a family comprises a single extant genus, *Kyphosus* Lacepède, 1801, and approximately 12 valid species (Fricke et al. 2023).

During management of the fish collection in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT), 111 kyphosid specimens were identified by the first author. They are listed below with distributional notes.

Materials and Methods

Identifications of the kyphosid specimens in ZUMT were confirmed by reference to Sakai and Nakabo (1995, 2004, 2006, 2008), Sakai (2001), and Honda et al. (2022). Standard lengths (SL) were measured for all specimens, which are arranged herein in alphabetical order by species. Collectors' name and affiliations are given where known (from ZUMT specimen catalog or tags), with Japanese language equivalents in parentheses. The following list includes ZUMT number, SL, collection locality, collection depth, collection date, collecting method, collector or donator and affiliation, and remarks when applicable. For some specimens without collecting dates in the ledgers or specimen tags, according to Koeda et al. (2022), the numbers of years before which the specimen was collected were estimated by their specimen numbers. Catalog numbers after ZUMT 62000 were newly given during this study.

Collection of Kyphosidae in ZUMT

Four species of the family Kyphosidae were represented by 111 specimens held in ZUMT, including three paratypes of *K. pacificus*. Specimens were collected from 1913 to 2021, mainly in the early years, many representing Kanagawa to Kochi Prefectures on the Pacific coast of Japan and the Izu Islands, southern Japan. The specimens from Hachijo-jima Island, Izu Islands, which account for most of these specimens, were donated by Yoshio Oshitsu (押津義雄), who is presumed to be a philanthropist from the Hachijo-jima Island (Koeda et al. 2022). The specimens, identified as *Kyphosus bigibbus* (Lacepède, 1801), *Kyphosus cinerascens* (Forsskål, 1775);

K. pacificus, *Kyphosus vaigiensis* (Quoy & Gaimard, 1825), were collected from the areas where these four species are still commonly found (Sakai and Nakabo 1995, 2004, 2006, 2008; Nakabo and Doiuchi 2013).

Kyphosidae イスズミ科
Kyphosus Lacepède, 1801 イスズミ属
Kyphosus bigibbus Lacepède 1801 ノトイスズミ

JAPAN

Ibaraki Pref.

ZUMT 31662, 72.5 mm SL, before 1936, K. Tashiro (田代清友).

Tokyo

ZUMT 4672, 128.6 mm SL, Tokyo Market, before 1915.

ZUMT 19127, 377.0 mm SL, Hachijo-jima I., Izu Is., coast of Mitsune, 3 July 1929, net fishing (probably gill net), Y. Otsuki (大槻洋四郎), local name "Sasagi (ササギ)".

ZUMT 19172, 377.0 mm SL, **ZUMT 19173**, 368.0 mm SL, **ZUMT 19174**, 325.0 mm SL, Hachijo-jima I., Izu Is., 7 July 1929, net fishing (probably gill net), Y. Otsuki.

ZUMT 19254, 378.0 mm SL, **ZUMT 19370**, 267.0 mm SL, **ZUMT 19402**, 316.0 mm SL, Hachijo-jima I., Izu Is., before 22 July 1929, Y. Oshitsu (押津義雄).

ZUMT 19273, 349.0 mm SL, **ZUMT 19309**, 404.0 mm SL, Hachijo-jima I., Izu Is., Mitsune, July 1929, Y. Oshitsu.

ZUMT 19483, 240.0 mm SL, Hachijo-jima I., Izu Is., Mitsune, before 22 July 1929, Y. Oshitsu.

ZUMT 32235, 35.6 mm SL, **ZUMT 32236**, 34.4 mm SL, **ZUMT 32238**, 35.6 mm SL, Tokyo (details unknown), Japan, before 1936.

ZUMT 32570, 187.8 mm SL, Fukagawa Fish Market (深川魚市場)[currently Monzen-naka-cho (門前仲町)], Koto-ku, Nov. 1928, S. Watanabe (渡辺洲三).

ZUMT 41925, 239.0 mm SL, Hachijo-jima I., Izu Is., probably before 1940, K. Uchiyama (内山吉五郎).

ZUMT 43371, 102.0 mm SL, Izu-oshima I., Izu Is., Habu Port, 17 Aug. 1933, N. Kuroda (黒田長礼).

ZUMT 44120, 171.1 mm SL, Hachijo-jima I., Izu Is., Sept. 1922, M. Uchiyama (内山 操).

ZUMT 44139, 191.3 mm SL, Hachijo-jima I., Izu Is., Mitsune, Sept. 1922, M. Uchiyama.

ZUMT 48296, 88.7 mm SL, **ZUMT 48297**, 67.2 mm SL, Aburatsubo Bay in Sagami Bay, Koajiro, Misaki, 1935, T. Abe (阿部宗明).

Kanagawa Pref.

ZUMT 21319, 28.1 mm SL, coast of Kanagawa Pref., 20 Sept. 1925, Kamakura Normal School [Shonan (Fujisawa) Junior High School] (鎌倉師範学校).

ZUMT 22692, 26.2 mm SL, Sagami Bay, Ajiro, Misaki, Aug. 1913.

ZUMT 43245, 47.2 mm SL, **ZUMT 43247**, 81.4 mm SL, **ZUMT 43250**, 55.2 mm SL, **ZUMT 43251**, 72.2 mm SL, **ZUMT 43252**, 44.8 mm SL, **ZUMT 43255**, 66.0 mm SL, Sagami Bay, Misaki, probably before 1940.

Shizuoka Pref.

ZUMT 43337, 31.8 mm SL, **ZUMT 43338**, 26.9 mm SL, Suruga Bay, Numazu, before 27 Dec. 1933, N. Kuroda.

Mie Pref.

ZUMT 7739, 52.8 mm SL, **ZUMT 7919**, 110.5 mm SL, Ise, before 1918, M. Kobayashi, Ise-yokkaichi Elementary School (伊勢四日市第一小学校 小林万作).

ZUMT 55514, 153.7 mm SL, Kumano-nada Sea, Owase, Aug. 1980, set net, K. Mochizuki (detail unknown).

Kochi Pref.

ZUMT 19937, 164.5 mm SL, Tosa Bay, Susaki, 22 July 1925, T. Kamohara (蒲原稔治).

Fukui Pref.

ZUMT 4431, 109.3 mm SL, Wakasa Bay, Sashu-obama (若州小濱), currently Obama, before 1915, N. Taniguchi (谷口直太郎).

Shimane Pref.

ZUMT 31319, 74.1 mm SL, Matsue, Shimane Pref., Japan, before 1936, R. Yanai (柳井隆一).

Yamaguchi Pref.

ZUMT 46447, 89.6 mm SL, Hagi, probably before 1940.

Nagasaki Pref.

ZUMT 31967, 104.7 mm SL, off Nagasaki Pref., before 1936, trawl, T. A. Glover (倉場富三郎).

Remarks: Tomisaburo Awajiya Glover (1871–1945), the donor of this specimen, is the son of Thomas Blake Glover (1838–1911), an individual engaged in trading activities in Japan during the late Edo and early Meiji eras (Faculty of Fisheries, Nagasaki University, 1973; Nagasaki University Library 2006). He edited “Fishes of Southern and Western Japan”, commonly known as “Glover Atlas (グラバー図譜)”, before his death, and the beautiful figures in it have been found to be of artistic value (Faculty of Fisheries, Nagasaki University, 1973; Senou 2013), although some argue that this has little scientific value because no specimens have remained to support it (Senou 2013). Since ZUMT has 21 specimens donated by him, including this one, future research may overturn the assessment that Glover Atlas has no scientific basis.

ZUMT 50022, 122 mm SL, Nakadori-jima I., Goto Is., Arikawa, 12 Oct. 1953, I. Tomiyama (富山一郎).

ZUMT 50194, 127.9 mm SL, ZUMT 50195, 135.4 mm SL, ZUMT 50196, 124.1 mm SL, ZUMT 50197, 132.3 mm SL, Nakadori-jima I., Goto Is., Arikawa, 18 Oct. 1953, I. Tomiyama.

Miyazaki Pref.

ZUMT 64169, 123.4 mm SL, Inoran-tani (イノラン谷), a fishing point of Kadogawa Bay (32°28'49"N, 131°42'44"E), 25 Oct. 2021, M. Fukatani (深谷真央).

UNKNOWN

ZUMT 48349, 49.7 mm SL, locality unknown (probably Japan), 3 July 1933.

ZUMT 63369, 187.5 mm SL, ZUMT 63370, 117.8 mm SL, locality and date unknown.

ZUMT ABE '60-199, 154.7 mm SL, ZUMT ABE '60-200, 157.7 mm SL, ZUMT ABE '60-1006, 82.1 mm SL, ZUMT ABE '60-1295, 150.7 mm SL, ZUMT ABE '60-1296, 132.8 mm SL, ZUMT ABE '60-1297, 121.8 mm SL, probably Manazuru, western Sagami Bay, Kanagawa Pref., Japan, 1960, T. Abe.

Remarks: The six specimens of *K. bigibbus* and the five specimens of *K. vaigiensis* (ZUMT ABE '59-678, ZUMT ABE '61-902, ZUMT ABE '60-1294, ZUMT ABE '60-1517, and ZUMT ABE '60-1618), registered by T. Abe, were highly likely collected from Manazuru. This assumption is based on the fact that T. Abe often purchased fish from local fisherman running set net in the Manazuru area in the 1960s. Both *K. bigibbus* and *K. vaigiensis* are commonly distributed in the coast of Sagami Bay, including Manazuru (Sakai and Nakabo, 1995, 2004, 2008; Senou et al. 2006; Honda et al. 2022).

Kyphosus cinerascens (Forsskal 1775) テンジクイサキ

JAPAN**Tokyo**

ZUMT 19457, 368.0 mm SL, Hachijo-jima I., Izu Is., before 22 July 1929, Y. Oshitsu.

ZUMT 32237, 33.8 mm SL, Tokyo (details unknown), Japan, before 1936.

ZUMT 63367, 364.0 mm SL, Ogasawara Is., Tokyo, Japan, Mar. 1913, S. Fujimori (藤森三郎), local name "Sasauo (ササウオ)".

Kanagawa Pref.

ZUMT 43244, 92.2 mm SL, **ZUMT 43248**, 62.9 mm SL, **ZUMT 43249**, 76.2 mm SL, **ZUMT 43253**, 72.2 mm SL, **ZUMT 43254**, 60.7 mm SL, Sagami Bay, Misaki, probably before 1940.

Shizuoka Pref.

ZUMT 10543, 98.7 mm SL, **ZUMT 10544**, 33.8 mm SL, Suruga Bay, Shizuura, Numazu, Aug. 1922, N. Kuroda.

Kochi Pref.

ZUMT 18878, 102.0 mm SL, Kashiwa-jima I., Aug. 1928, T. Kamohara, local name "Kitsuuo (キツウオ)".

ZUMT 47012, 280.0 mm SL, probably before 1940, T. Kamohara.

Okinawa Pref.

ZUMT 14329, 106.4 mm SL, Okinawa-jima I., Ryukyu Archipelago, Naha, Okinawa Pref., Japan, 6 Feb. 1925, H. Yashiro (屋代弘孝).

ZUMT 16834, 103.6 mm SL, **ZUMT 16835**, 111.7 mm SL, **ZUMT 16836**, 116.2 mm SL, Okinawa-jima I., Ryukyu Archipelago, Onna, Kunigami, Okinawa Pref., Japan, before 1926, S. Tanabe (田辺貞夫).

PALAU

ZUMT ABE 2817, 153.2 mm SL, **ZUMT ABE 2818**, 158.9 mm SL, 1936, T. Abe.

PHILIPPINES

ZUMT 42372, 217.0 mm SL, **ZUMT 42377**, 207.0 mm SL, Basilan, 1926, U. Yamamura (山村樸次郎).

UNKNOWN

ZUMT 39276, 103.2 mm SL, probably Japan, before 1938.

ZUMT 39368, 33.8 mm SL, 1 probably Japan, before 1939.

Kyphosus pacificus Sakai & Nakabo, 2004 ミナミイスズミ

JAPAN (Tokyo)

ZUMT 6830, 143.8 mm SL, Ogasawara Is., before 1915, S. Fujimori (藤森三郎), local name "Sasauo (ササウオ)".

ZUMT 19160, 316.0 mm SL, Hachijo-jima I., Izu Is., 6 July 1929, line fishing, Y. Otsuki, local name "Sasagi (ササギ)".

ZUMT 19310, 263.0 mm SL, **ZUMT 19311**, 232.0 mm SL, **ZUMT 19312**, 224.0 mm SL, Hachijo-jima I., Izu Is., Mitsune, July 1929, Y. Oshitsu.

ZUMT 19403, 229.0 mm SL, **ZUMT 19409**, 264.0 mm SL, **ZUMT 19430**, 216.0 mm SL, **ZUMT 19432**, 205.0 mm SL, Hachijo-jima I., Izu Is., before 22 July 1929, Y. Oshitsu.

ZUMT 19482, 238.0 mm SL, **ZUMT 19484**, 229.0 mm SL, Hachijo-jima I., Izu Is., Mitsune, Hachijo, Tokyo, Japan, before 22 July 1929, Y. Oshitsu.

ZUMT 31003, 173.7 mm SL, paratype of *Kyphosus pacificus*, Hachijo-jima I., Izu Is., Hachijo, Tokyo, Japan, before 1935, local name "Hatouwo (ハトウワ)".

ZUMT 38887, 150.9 mm SL, Hachijo-jima I., Izu Is., before 1938.

ZUMT 40568, 143.8 mm SL, Hachijo-jima I., Izu Is., probably before 1940.

ZUMT 63368, 221.0 mm SL, Ogasawara Is., Mar. 1913, S. Fujimori, local name "Sasauo (ササウオ)".

Remarks: In this study, the scientific name *Kyphosus pacificus* Sakai & Nakabo, 2004 was adopted for the species. Knudsen and Clements (2013) used a principal component analysis to consider *Kyphosus sectatrix* (Linnaeus, 1758) as a senior synonym of *K. pacificus*, based on morphometric characteristics measured from multiple specimens of *K. sectatrix* and a single paratype specimen of *K. pacificus*. However, this conclusion is hardly reliable due to problems such as the fact that a material (MNHN 0000-2977) examined as a holotype of *K. sectatrix* is actually a non-type specimen and that only one sample was used as material of *K. pacificus* (Knudsen and Clements 2013; Gilbert 2015).

The description of *Perca saltatrix* (= *Kyphosus sectatrix*) by Linnaeus (1758) is based on a sketch of an individual obtained from the Gulf of Mexico (Catesby, 1743: 8, pl. 8, middle figure). The sketch depicts the upper lateral surface of the individual as brownish with scattered dull yellow spots, while the lower half is described as having contrasting yellow and white vertical lines (Catesby, 1743). Although no species of the genus *Kyphosus* from the Gulf of Mexico perfectly matches this sketch and the described characteristics, there are similarities to the approximately 80 mm SL individuals of *Kyphosus sectatrix* presented by Knudsen and Clements (2013) in terms of having a dark-colored upper lateral surface with scattered light-colored spots and a light-colored lower half without prominent light-colored spots (Knudsen and Clements, 2013: fig. 17H). This differs from the coloration characteristics of juvenile *K. pacificus*, which have a uniformly dark body with densely distributed white spots throughout the body (Honda et al. 2022; figs. 5, 6A, C). Furthermore, Gilbert (2015) designates a neotype for *K. sectatrix*, and this specimen can be distinguished from the holotype and paratypes of *K. pacificus* based on counts and measurements such as the number of vertical scale rows (Sakai and Nakabo, 2004, 2014). Based on these circumstances, this study distinguished *K. pacificus* and *K. sectatrix* as separate species and treats *K. pacificus* as valid species.

Kyphosus vaigiensis (Quoy & Gaimard 1825) イスズミ

JAPAN

Tokyo

ZUMT 19159, 278.0 mm SL, Hachijo-jima I., Izu Is., 6 July 1929, line fishing, Y. Otsuki, local name "Hatouo (ハトウオ)".

ZUMT 19433, 315.0 mm SL, Hachijo-jima I., Izu Is., before 22 July 1929, Y. Oshitsu.

Shimane Pref.

ZUMT 4359, 178.8 mm SL, off Hamada, 5 Oct. 1914, Shimane Prefectural Fisheries Experimental Station (島根県水産試験場).

ZUMT 4400, 162.6 mm SL, Hamada Fisheries Experimental Station, Setogashima, Hamada, before 1915.

ZUMT 31174, 169.0 mm SL, ZUMT 31487, 158.7 mm SL, Matsue, before 1936, R. Yanai (柳井隆一).

Yamaguchi Pref.

ZUMT 8634, 169.0 mm SL, Senzaki, Nagato, 10 Oct. 1918, Toshiro Kumada, Senzaki [熊田頭四郎 (山口県仙崎)].

Nagasaki Pref.

ZUMT 50035, 154.7 mm SL, East China Sea, Fukue-jima I., Goto Is., Fukue, Goto, Nagasaki Pref. Japan, 12 Oct. 1953, I. Tomiyama.

Okinawa Pref.

ZUMT 19087, 225.0 mm SL, Okinawa-jima I., Ryukyu Archipelago, 23 May 1928, Okinawa Prefectural Fisheries Experimental Station (沖縄県水産試験場).

PALAU

ZUMT ABE 2935, 351.0 mm SL, **ZUMT ABE 3745**, 209.0 mm SL, **ZUMT ABE 3927**, 164.4 mm SL, Palau, 1936, T. Abe.

UNKNOWN

ZUMT 46345, 236.0 mm SL, locality unknown, probably before 1940.

ZUMT ABE '59-678, 283.0 mm SL, **ZUMT ABE '61-902**, 121.2 mm SL, **ZUMT ABE '60-1294**, 170.5 mm SL, **ZUMT ABE '60-1517**, 179.4 mm SL, **ZUMT ABE '60-1618**, 150.1 mm SL, probably Manazuru, western Sagami Bay, Kanagawa Pref., Japan, 1961, T. Abe.

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