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標本資料報告 第 129 号

The University Museum, The University of Tokyo
Material Reports No. 129

東京大学総合研究博物館動物部門所蔵
魚類標本リスト(2)

**Catalogue of fish collection deposited
in the Department of Zoology,
The University Museum, The University of Tokyo
Vol. 2**

小枝圭太・上島 励
Keita KOEDA and Rei UESHIMA

令和 4 年 東京
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はしがき

本書は『東京大学総合研究博物館動物部門所蔵 魚類標本リスト(1)』(2022)に次ぐ第2号である。2021年5月から現在にかけて、第一編者を中心として、研究事業協力者や外部研究者、ボランティアによって東京大学総合研究博物館動物部門所蔵の魚類標本(ZUMT: The Department of Zoology, The University Museum, The University of Tokyo)コレクションの整理作業が進められている。

第1号では、10報の論文により、ZUMTに収蔵された1目および11科の標本目録とウナギ目のタイプ標本目録を報告した。第2号においては17報のZUMT標本目録(ギンザメ目、アカマンボウ目、マトウダイ目、イボダイ亜目、ウナギ科、ミズウオ科、コモチサヨリ科、キホウボウ科、シロカサゴ科、シイラ科、ギンカガミ科、ハチビキ科、マツダイ科、キンチャクダイ科、マンジュウダイ科、ミシマオコゼ科、イボダイ科、ドクウロコイボダイ科、カマス科、クロタチカマス科、ノコギリハゼ科)および2報(Part 2:ヌタウナギ目、ネズミザメ目、メジロザメ目、ツノザメ目、シビレエイ目、ガンギエイ目、ギンザメ目、チョウザメ目;Part 3: ニシン目、ソコギス目、ニギス目、ワニトカゲギス目、コイ目、ヒメ目、タラ目、アシロ目)のタイプ標本目録を掲載することができた。また本号には、これまでの目録作成の過程で明らかになってきたZUMT標本の歴史および標本に関わった人物に関する知見をまとめた論文も掲載した。

ZUMT標本の概要や歴史については、第1号の「はしがき」および本号掲載の論文で述べたため、詳しくは繰り返さない。第1号、第2号と続いた私たちの活動により、ZUMTコレクションの活発な利用へと繋がり、新たな学術的発見へと繋がっていくことを切に願う。なお、標本整理作業は現在も引き続きすすめられており、今号に掲載できなかった分類群の標本目録については次号以降にて掲載する予定である。

本プロジェクトの推進および本目録の出版に際しては多くの方々のご協力を得た。東京大学総合研究博物館の研究部教員、事務職員の方々には様々な御支援をいただいた。特に、2020年の標本庫の全面的改修工事に際しては、米村裕次郎副課長をはじめ博物館事務職員の方々の多大なるご尽力をいただいた。本プロジェクトは、平成11-令和4年度の本学総合研究博物館プロジェクト研究経費、公開利用経費による援助を受けて実施された。藍澤正宏氏、坂本一男氏、畑 晴陵氏、和田英敏氏、小林大純氏、手良村知功氏、日比野友亮氏には、標本の観察や同定、管理・維持作業に加え原稿の執筆、確認をしていただいた。ボランティアの宮下雄博氏、尾形比呂哉氏および東京海洋大学の阿部意央太氏、藤原咲紀氏、飯沼 藍氏、齋藤 舞氏、高橋あゆみ氏、東京大学の深谷真央氏、伊藤想也氏にはZUMT標本の管理・維持作業を手伝っていただいた。これらの方々に、この場を借りて、厚くお礼申し上げたい。最後に、ZUMT標本が今日に至るまでに多大な貢献をいただいた故富永義昭氏に深い感謝の意を示したい。

2022年5月20日

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東京大学総合研究博物館動物部門の魚類コレクションの歴史

History of the fish collection of the Department of Zoology, The University Museum, The University of Tokyo

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Abstract

The history of the ZUMT collection's accumulation and the related people were organized in chronological order on the basis of specimen ledgers and references. As a result, the history and chronological activity of the specimen collection over the approximately 120 years from 1904 to the present were clarified.

はじめに

東京大学総合研究博物館動物部門所属の魚類コレクション (ZUMT: The Department of Zoology, The University Museum, The University of Tokyo) は、1900 年代の初頭より集積された日本最古の魚類標本コレクションである。2022 年 3 月現在、約 64000 点の魚類標本が登録、収蔵されており、一つの登録番号に複数個体が登録されていることもあることから、その総数は 15 万個体とも推定されている。2021 年より、同コレクションの管理、整理ならびに目録化を目的とした整理作業が進められており、その過程でこの約 120 年の間に ZUMT 標本に関わった様々な人たちの活動やライフイベント、災害、戦争にともなう ZUMT 標本との関係の変化などが明らかになってきた。また、標本台帳に記載された情報を整理することにより、年代毎の標本の増加数やコレクションの活性や推移についての理解が深まった。本稿においては、今後の目録作成および標本利用の一助となることを目的として、現時点で集積された知見を整理し、利用可能とすることを目的とした。

材料と方法

ZUMT 魚類標本に関わる人物および組織の動向を年単位で整理した。年表作成には ZUMT 標本台帳ならびに以下に示した文献および未発表資料を参考にした。なお、参考文献により同じ動向に対して異なる年が示されていた場合は、文献の信頼性の高さや他の動向との整合性に則って判断した。また、各年において登録された標本番号および標本数を台帳に記録された各年の最も若い番号をもとに計数した（これらは標本の採集年ではなく、登録年を示す）。

参考文献

- Abe, T. 1939. A list of fishes of the Palao Islands. *Palao Tropical Biological Station Studies*, 1 (4): 523–583.
- 阿部宗明. 1975. 名誉会員 田中茂穂先生を偲ぶ. *動物学雑誌*, 84 (1): 93.
- 阿部宗明. 1981. I. 故富山一郎博士追惜の辞. *動物学雑誌*, 90 (3): 398.
- 赤松邦太郎. 1904. 白魚. *動物学雑誌*, 191: 323–344.
- 青木赳雄. 1913. 静岡縣田方郡内浦村附近魚類. *魚学雑誌*, 1 (5): 11–12.
- 福地定吉・金子一狼. 1913. 長崎産フカに就て. *魚学雑誌*, 1 (2): 16–18.
- 不破 茂. 2015. 昭和の釣りの碩学・松崎明治. *ミュージアム知覧紀要・館報*, 14: 47–52.
- 蜂須賀正氏. 2006. 南の探検. 平凡社, 東京. 484 pp.
- 畑井新喜司. 1940. パラオ熱帯生物研究所及其の事業に就て. *科学南洋*, 3 (1): 3–11.
- 本誌記者 (著者名不明). 1936. 「南洋の家」山村家を訪ねて. *南洋水産*, 18: 42–43.
- Hubbs, C. L. 1975. Shigeo Tanaka, 1878–1974. *Copeia*, 4: 792.
- Iijima, I. and Sasaki, C. 1882. Okadaira Shell Mound at Hitachi, Being an Appendix to Memoir Vol. I, Part I of the Science Department, Tokio Daigaku (University of Tokio). Tokyo Daigaku, Tokyo. 66 pp.
- 石田寿老. 1942. 樺太のイワナ (I) アメマスとエゾイワナ. *動物学雑誌*, 54 (9): 347–353.
- 岩見哲夫. 1997. 阿部宗明先生のご逝去を悼む. *タクサ*, 2: 1–2.
- Jordan, D. S. and Evermann, B. W. 1902. Notes on a collection of fishes from the island of Formosa. *Proceedings of the United States National Museum*, 25 (1289): 315–368.
- Jordan, D. S., Tanaka, S. and Snyder, J. O. 1913. A catalog of fishes of Japan. *The journal of the College of Science, Imperial University of Tokyo, Japan*, 33: 1–479.
- Jordan, D. S. and Tanaka, S. 1927. The fresh water fishes of the Riukiu Island, Japan. *Annals of the Carnegie Museum*, 17 (2): 259–280+xxii–xxiii.
- 嘉数 修. 2011. 黒岩恒の著作物および新聞掲載記事について. *資料編集室紀要*, 34: 11–32.
- 金子一狼. 1913. 長崎方言の「カナガシラ」. *魚学雑誌*, 1 (1): 13–16.
- 金子一狼. 1913. 長崎方言のグチ. *魚学雑誌*, 1 (4): 5–8.
- 河上才次. 1913. 熊本附近魚類. *魚学雑誌*, 1 (4): 15–19.
- 木下盛枝. 1928. 柳河ノ淡水魚. 福岡県柳河高等女学校, 柳河. 4 pp.
- 小枝圭太・上島 励. 2022. はしがき. 東京大学総合研究博物館標本資料報告, 128: i–vi.
- 高知大学文理学部生物学教室同窓会. 1965. 蒲原稔治博士退官記念誌. 高知大学文理学部生物学教室同窓会, 高知. 28 pp.

- 黒田長礼. 1927. 比律賓群島ベシラン島採集鳥類に就て. 鳥, 5 (23): 199–261.
- 黒岩 恒. 1927. 琉球島弧に於ける淡水魚類採集概報. 動物学雑誌, 39 (467): 355–388.
- Masuda, S. 1942. Notes on the Japanese fishes of the genus *Epinephelus*. *Annotationes Zoologicae Japonenses* 21: 106–123.
- 松井 魁. 1983. 書誌学的水産学史並びに魚学史. 鳥海書房, 東京. 203 pp.
- Matsuura, K. 1997. Fish collection building in Japan, with comments of major Japanese ichthyologists. Pp. 171–182. In: Pietsch, T. W. and Anderson Jr., W. D. (eds.) *Collection building in ichthyology and herpetology*. The American Society of Ichthyologists and Herpetologists, Kansas, U.S.A.
- 眞作佳吉. 1985. ぎんざめノ一新属ニ就キテ. 動物学雑誌, 7 (80): 182–184.
- 宮崎 直・金子一狼. 1913. 長崎縣産の魚類方言に就て. 魚学雑誌, 1 (2): 16.
- Okada, Y. 1927. A study on the distributin of tailless batrachians of Japan. *Annotationes Zoologicae Japonenses*, 11: 137–143.
- 岡田弥一郎. 1931. 渡瀬先生と日本生物地理學會. 動物学雑誌, 43: 508–510.
- 岡田弥一郎. 1936. 南洋の思ひ出. 動物学雑誌, 48: 8–10.
- 瀬能 宏. 1998. 研究ノート 魚学史—日本の魚を研究した人たち. 自然科学のとびら, 4 (2): 10–11.
- 鈴木 実. 1981. 恩師加藤光次郎博士と分類学. 動物分類学会会報, 54: 5–10.
- 田中徳久・高橋秀男. 2007. 「宮代コレクション」の神奈川県レッドデータ植物. 神奈川自然誌資料 (28): 29–38.
- 田中茂穂. 1908. 飯島博士採集南樺太の魚類に就いて. 動物学雑誌, 20 (232): 33–47, pl. 3.
- 田中茂穂. 1913. 魚類の採集保存及運送法. 田中茂穂, 東京. 6 pp.
- 田中茂穂. 1913. 簡易魚類採集法. 魚学雑誌, 1 (1): 2–5.
- 田中茂穂. 1913. 信州及び北陸道旅行記. 魚学雑誌, 1 (2): 18–20.
- 田中茂穂. 1913. 各地研究者小照 (二). 魚学雑誌, 1 (2): 20.
- 田中茂穂. 1913. 各地研究者小照 (四). 魚学雑誌, 1 (4): 29.
- 田中茂穂. 1918. 東京市場の鮮魚に就て (豫報). 動物学雑誌, 30 (356): 242–243.
- 田中茂穂. 1926. 食用魚類. 南効社, 東京. viii+310 pp.
- 田中茂穂. 1928. 同種か別種かを鑑別する標準. 動物学雑誌, 40 (481): 433–447.
- Tanaka, S. 1931. On the distribution of fishes in Japanese waters. *Journal of the Faculty of Science, Imperial University of Tokyo. Section 4, Zoology*, 3: 1–90, pls. 1–3.
- 田中茂穂. 1933. 動物及び植物に於ける種類とは何ぞや, 同一種内に起こる品種とは何ぞや. 動物学雑誌, 45 (540): 411–452.
- 田中茂穂. 1934. 奇魚珍魚. 興学会出版, 東京. viii+210 pp.
- 田中茂穂. 1935. 魚の随筆. 龍星閣, 東京. 224 pp.
- 田中茂穂. 1948. 大東亜の魚. 文祥堂, 大阪. 172 pp.
- 東京大学総合研究資料館. 1984. 遠隔と現状. 総合研究資料館ニュース, 1: 3–6.
- 富永義昭・佐藤寅夫. 1973. 標本瓶について. 魚類学雑誌, 20 (1): 53–55.
- 富永義昭. 1981. 富山一郎先生を偲ぶ. 魚類学雑誌, 28 (1): 108–109.
- 富永義昭. 1988. 田中茂穂 (1878–1974). Pp. 325–331. In: 木原 均・篠遠善人・磯野直秀 (編) 近代日本生物学者小伝, 平川出版社. スカイビュープランニング, 東京. 197 pp.

- 富永義昭. 1991. 寒天の利用. 総合研究資料館ニュース, 22: 2–3.
- Tomiya, I. 1972. List of the fishes preserved in the Aitsu Marine Biological Station, Kumamoto University, with notes on some interesting species and descriptions of two new species. Publications from the Amakusa Marine Biological Laboratory, Kyushu University, 3 (1): 1–21.
- 富山一郎. 1975. 田中茂穂先生に師事して. 魚類学雑誌, 22: 119–124.
- 富山一郎. 1979. 魚類の標本. 東大資料館収蔵資料, 11: 26–31.
- 椿 六郎. 2006. 富永シヅ物語—国産初の冷凍車を走らせた女性.
- 上野輝彌. 1994. 富永義昭博士を偲んで. 魚類学雑誌, 41 (3): 351.
- 宇井縫蔵. 1924. 紀州魚譜. 紀元社, 東京. 282+43 pp.
- 山村八重子. 1937. 南洋生物採集行脚秘録. 南洋水産, 3 (5): 33–40.
- 柳井隆一. 1950. 山陰の魚類. 動物学雑誌, 59 (1): 17–22.
- 矢野正敏. 1980. 魚学者田中茂穂の生涯. 日本病跡学雑誌, 19: 66–70.

参考資料

- 故田中茂穂博士生誕百年記念の集いパンフレット. 1978年8月16日開催. 東京海洋大学附属図書館アーカイブス宇田道隆文庫
- 高知市立龍馬の生まれたまち記念館ホームページ. 2018. 学芸員エッセイ その39 「近代日本の魚類学者・田中茂穂」. <https://ryomahometown.com/20180327/essay39.html> (アクセス日時: 2021年3月29日)
- 牧野富太郎. 1930–1944. 牧野富太郎の日記. 東京大学総合研究博物館所蔵.
- 三崎臨海実験所ホームページ. 三崎臨海実験所の歴史. <https://www.mmbs.s.u-tokyo.ac.jp> (アクセス日時: 2021年3月29日)
- 富永義昭. 未発表原稿. 田中茂穂博士の業績. 東京大学総合研究博物館所蔵.

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ZUMT 魚類標本の歴史

ZUMT 魚類標本に関わる人物および組織の動向が整理され、人物間の相関関係や組織の改変、災害、戦争による ZUMT 魚類標本への影響が明らかになった。コレクションの沿革については、小枝・上島 (2022) を参照のこと。

ZUMT 魚類標本の収集と管理を始めた田中茂穂は 1904 年より本格的に収集と登録を始めた (Fig. 1)。当初は動物学教室の教員が収集していた標本の登録作業が中心で

あり、新たな収集標本は少ない。年間の標本登録数は 1900 年代で 167 標本/年、1910 年代で 688 標本/年、1920 年代で 1014 標本/年、1930 年代で 2073 標本/年と加速度的に増加するが、これは 1911 年より田中が編纂した「日本産魚類図説」の影響により全国に標本提供ネットワークが構築されたことに加え、1930 年代に入り富山一郎や阿部宗明が標本登録作業に参加したことも大きく影響したであろう。当時の田中が築いたネットワークは驚異的で、47 都道府県すべてから標本が集まっていることはもちろん、樺太、朝鮮、中国、台湾、フィリピンをはじめとする海外（時代によっては国内ともいえる）より、実に網羅的に魚類を収集しており、その協力者の数は 1000 人に迫る。田中の収集した標本のほとんどはホルマリン液浸で保存され、布地に墨で書かれたタグが付されているため明瞭であるが、ZUMT 2000 番台以前の初期のものは紙に鉛筆書きされているためタグの取り扱いには注意が必要である。なお、1904 年から始まった ZUMT 標本の集積は、1939 年末の時点で約 40000 点に及んでいる。この時点で未登録であった標本が、1940 年以降も多数登録されている点を考慮すると、ZUMT 魚類標本のほとんどは 1940 年以前に採集されたものと表現しても差し支えないであろう。

1940 年代には登録数が 735 標本/年と大きく落ち込んだ。これは、太平洋戦争による研究活動への重大な影響に加え、田中の定年退官（1938 年）、富山の中国への赴任（1937 年）が重なったことに起因するであろう。また、田中門下の次世代を担うべき犬尾三郎や増田繁雄が太平洋戦争により若くして亡くなってしまったことも、その後の動向に大きく影響したものと推察される。この期間中の標本登録数が 0 であった年が 7 年もあることから、この約 10 年がいかに研究者にとって難しい時代であったかが窺える。なお、1941 年と 1943 年に年間 3000 を超える標本が登録されている点は驚愕であるが、これらの大部分は古い標本であり、1940 年代前半に魚類採集をおこなった痕跡はほとんどみられなかった。ただし、阿部は自身で採集した標本は標本タグの標本番号に下線を付した別コレクションとして管理していたことから、阿部自身がこの期間に魚類の採集をおこなっていたかは不明である。

阿部が 1947 年に農林省東海区水産試験所に任官したことにより、1950 年代の標本登録数は減少し、富永義昭が大学院生として富山の門下生となる 1959 年を除くと、183 標本/年となる。その後は、1960 年代で 152 標本/年、1970 年代で 182 標本/年と、登録数が 100 未満である年が多くなるが、1983 年に藍澤正宏が富永事務所に入ると登録数が再び増加し、1989 年には 2500 標本以上が登録されるなど、1980 年代は 467 標本/年となる。その後は 1991 年に藍澤が富永事務所を退職することにより、登録数が著しく減少して、現在に至る。

以下に各年における ZUMT 魚類標本に関わる人物および組織の動向を列挙する。

【1895 年】

篤作佳吉により日本人による初めての魚類新種が記載される。記載された種は *Harriotta pacifica* (Mitsukuri, 1895)（現在は属 *Rhinochimaera*）テングギンザメで、相州栗濱（現在の横須賀市久里浜）の漁師が三崎沖の深海で漁獲した個体を東京市場で購入した。ただし、記載に用いられたホロタイプ（ZUMT 1453）の所在は不明。

【1900 年】

David Starr Jordan の研究グループが来日する。

【1901年】

田中茂穂が東京帝国大学理学部動物学科に入学する。

【1903年】

田中が箕作のもとで魚類の研究を始める。

【1904年】 ZUMT 597-913 (年間登録数 317 標本)

田中が 26 歳で東京帝国大学理学部動物学科を卒業。魚類コレクションの収集と ZUMT への登録を開始する。登録当初は外国産と国内産を異なる標本台帳に記録しており、最も古い標本 (ZUMT 597 : D.S. Jordan より寄贈された外国産標本) は 1904 年 5 月 19 日に登録されている。ZUMT 596 以前の標本およびそれらの台帳の所在は不明である。同年初夏に Alan Owston が所蔵したテングギンザメ標本の写真が撮影される。

【1905年】 (登録なし)

田中が 27 歳で東京帝国大学理学部動物学科の助手に就任する。2 度目の来日である Jordan に会い、文科省の補助を受けて調査に協力する。田中による初めての魚類の新種記載 (*Chimaera jordani* Tanaka, 1905 ジョルダンギンザメおよび *Chimaera owstoni* Tanaka, 1905 オーストンギンザメ) をおこなう。これら 2 種のタイプシリーズはいずれも所在不明。田中が結婚。

【1906年】 ZUMT 914-964 (51 標本)

3 月に田中と青木熊吉が陸前牡鹿郡女川村 (現在の宮城県女川町) および竹の浦 (石巻市) へ採集紀行。魚類だけでなくカメホウズキチョウチン (UMUTZ-Bra-AB-30) など無脊椎動物も採集する。

【1911年】 ZUMT 2929-3204 (276 標本)

Jordan が 3 度目の来日。田中は講師として Jordan の三崎臨海実験場での採集に協力する。田中が日本産魚類図説の編纂を開始する。

【1912年】 ZUMT 3205-3412 (208 標本)

田中が 5 月に信州と北陸へ旅行し、各地の師範、中学、高等女学校を訪問する。

【1913年】 ZUMT 3413-3817 (405 標本)

1235 種の魚類を収録した「日本産魚類目録」を Jordan および John Otterbein Snyder と共著で発表する。田中は本論文の原稿を渡米して Jordan に校閲を依頼した。その際、わずかな修正とともに Jordan 自身も共著者として入りたいとの申し出を受けたことを大変喜んだという。田中が私費で魚学雑誌を創刊するが、同年中に 1 巻 7 号まで出版し、廃刊となる。

【1915年】 ZUMT 4351-6906 (2556 標本)

田中が本年より 1918 年にかけて動物学雑誌に「日本産魚類の〇〇新種」を出版し、全 19 報で約 80 新種を記載。これらは日本語で書かれ、記載に基づいたタイプ標本の情報が記されていない。Owston が横浜で死去。

【1918 年】 ZUMT 8304–8542 (239 標本)

田中が Jordan より日本語での新種記載を控えるよう注意される。

【1920 年】 ZUMT 9514–9955 (442 標本)

田中が助教授に就任。

【1923 年】 ZUMT 10954–11703 (750 標本)

関東大震災により、タイプを含む標本と田中の蔵書の一部が失われる。また、黒岩恒によって採集された種子島産標本の大部分も失われた。

【1926 年】 ZUMT 17471–17612 (142 標本)

田中がスタンフォード大学に留学する。

【1927 年】 ZUMT 17613–18145 (533 標本)

田中がスタンフォード大学より帰国する。多様な魚類標本に触れ、スプリッター（種を分けることを好む）からランパー（種をまとめることを好む）へと意識が変わる。カリフォルニアで標本を採集、購入して持ち帰る。富山一郎が東京帝国大学理学部動物学科に入学する。当時の動物学教室は弥生門近くの 3 階建て、その東側に位置した。

【1928 年】 ZUMT 18146–18863 (718 標本)

富山が田中の最初の弟子となる。高知高等学校教授の蒲原稔治が魚類の研究を始め、高知より標本が多数送付されるようになる。田中による昭和天皇への御進講が始まり、退官まで続く。

【1929 年】 ZUMT 18864–19658 (795 標本)

富山が卒業研究として「タイ科魚類の形態」に取り組む。魚河岸より魚を持ち込む人がおり、多少珍しい魚があれば田中が買い上げていたという。

【1930 年】 ZUMT 19659–23472 (3814 標本)

富山が大学院に進学し、「日本産ハゼ科魚類の分類学的研究」に取り組む。富山が田中より標本整理の一部を任されるようになる（23 冊目の標本台帳より）。

— 当時の標本室の様子 —

標本室は田中の部屋と廊下を隔てて建物の隅角部を占める広い部屋で、半地下であり、暗室としてあった。小型標本は種ごとに分けられ、1~3 個体より多い数個体以上が採集地を問わず直径 12 cm 高さ 25 cm の広口瓶にまとめて保存されていた。大型標本は直径 30 cm 高さ 60cm の円筒形のガラス容器に保存されていた。標本の保存液はほぼホルマリンであった。天井に届く丈夫な棚が設置され、最下段に大型、そのうえの数段に広口瓶、最上の 2 段に小型瓶が田中（1913）の分類順に並べられていた。標本には墨で書かれた番号札が二重の白い糸で結び付けられていた。小型種で同時に多数採集されたものは、瓶でまとめて 1 つの番号が与えられていた。標本台帳は大学ノートであった。

【1931年】 ZUMT 23473–24241 (769 標本)

田中の「日本産魚類図説」の出版が48巻で終了する。この年の途中から標本登録は専ら富山によっておこなわれる。富山が5月と10月に有明海へ初めての採集紀行。田中が学位論文「On the distribution of fishes in Japanese waters」を出版し、学位を取得。これ以降、徐々に現役を退く。

【1932年】 ZUMT 24242–25291 (1050 標本)

富山が10月に富山湾魚津・滑川へ採集紀行、多量の標本を収集する。阿部宗明が東京帝国大学理学部動物学科に入学する。

【1933年】 ZUMT 25292–26314 (1023 標本)

田中が動物学雑誌の編集を担当し、富山と福田宗一は校正の補助をおこなう。前年に動物学科を卒業し、三井海洋生物学研究所に勤務する石田寿老より多数の標本が提供される(2021年にZUMT標本登録)。

【1934年】 ZUMT 26315–30195 (3881 標本)

阿部宗明が田中の門下生となり、フグ類の研究を開始する。赤門付近の理学部二号館(3階建て地下1階)に動物学教室が移転する。富山、阿部が地下標本室への移動を担当する。標本瓶のうち大型の円筒形ガラス瓶はもろくなっているものがあつたという。田中は3階の部屋に移動し、自室には標本瓶を持ち込まないと宣言。富山が結婚、田中が祝辞を述べる。

【1935年】 ZUMT 30196–31513 (1318 標本)

本年より蒲原がときどき動物学教室を訪問して、田中に師事する。阿部が大学院に進学する。犬尾三郎が門下生となり、ベラ類の研究を開始する。

【1936年】 ZUMT 31514–37460 (5947 標本)

阿部がパラオ熱帯生物研究所に滞在する。

【1937年】 ZUMT 37461–38679 (1219 標本)

富山が学位論文「Gobiidae of Japan」を出版し、学位を取得。阿部がパラオより帰国する。石田が門下生となり、前年より同年にかけて滞在していた樺太より持ち帰ったサケ目標本を用いた研究をはじめ。1929年より田中に標本を提供していた増田繁雄が東京帝国大学理学部動物学科に入学する。太平洋戦争が開始する。

【1938年】 ZUMT 38680–39287 (608 標本)

田中が教授に就任し、三崎臨海実験所の所長を兼任する。田中が還暦を迎え、祝賀会にて牧野富太郎が祝辞を述べる。富山が上海自然科学研究所に赴任する。

【1939年】 ZUMT 19288–40390 (1103 標本)

田中が定年により退官する。標本の管理は大学院生の阿部が引き継ぐ。田中夫妻を囲む会が開催、牧野が出席。

【1940 年】 (登録なし)

阿部主導により研究室、標本室が同館の別室に移動する。阿部が修士課程を修了し、動物学教室の研究生となる。1942 年にかけて田中と牧野がたびたび会食する。

【1945 年】 (登録なし)

田中が北海道に在住。太平洋戦争が終戦。終戦にともない富山が上海より帰国。

【1946 年】 (登録なし)

富山が三崎臨海実験所に勤務。

【1947 年】 (登録なし)

阿部が農林省東海区水産試験所に任官。

【1948 年】 (登録なし)

富山が東京大学職員として研究室を利用する。

【1949 年】 (登録なし)

富山が宮内庁侍従職御用掛となる。

【1952 年】 ZUMT 47742-47821 (80 標本)

富山が三崎臨海実験所の所長に就任する。阿部が学位論文「日本近海産マフグ科魚類の分類学的研究」を出版し、学位を取得。田中が蒲原の招きにより、高知大学で講義をおこなう。

【1953 年】 ZUMT 47822-48354 (533 標本)

富山、阿部により「日本産魚類図説」の 49 巻以降が編纂される。

【1955 年】 ZUMT 48365-48584 (220 標本)

富永義昭が東京大学理学物生物学科に入学する。

【1958 年】 ZUMT 49193-49571 (379 標本)

富山、阿部による「日本産魚類図説」の出版が 60 巻で終了する。

【1959 年】 ZUMT 49572-50901 (1330 標本)

富永が修士課程として富山の門下生となる。

【1960 年】 ZUMT 50902-51924 (1023 標本)

富山が教授に就任する。阿部が東海区水産研究所資料部の主任研究官に任官する。

【1961 年】 ZUMT 51925-52195 (271 標本)

富山がサラワクに出張する。サラワク博物館の Tom Harrison より標本の寄贈を受ける (2021-2022 年に ZUMT 標本登録)。

【1963年】 ZUMT 52308–52312 (5 標本)

富永が博士課程を中退し、三崎臨海実験所の助手に就任する。

【1965年】 ZUMT 52313–52332 (20 標本)

田中は水戸に在住し、学名に関する著書（未発表）の執筆をする。

【1966年】 (登録なし)

東京大学に総合研究資料館が新設され、富永の主導、阿部や学生の補助のもと標本室と研究室が移動される。保存液をホルマリンからエタノールに変える作業が開始される。富永が助手を退任し、家業を継ぐ傍ら、理学部の非常勤講師として魚類の研究をつづける。

【1967年】 (登録なし)

田中が東京に移住。富山が九州大学天草臨海実験所に赴任し、資料館に魚類の専任教員が不在となる。

【1968年】 ZUMT 52333–52419 (87 標本)

富永がハタネボ科魚類の研究で学位を取得。資料館の第二拡張工事により、標本室と研究室が拡張され、動物学教室に残されていた多数の無脊椎動物標本も資料館に移動される。

【1969年】 ZUMT 52420–52422 (3 標本)

佐藤寅夫が阿部に師事し、大学院生としてフエフキダイ科魚類の研究をはじめめる。

【1970年】 ZUMT 52423–52706 (284 標本)

富山が九州大学天草臨海実験所を退官、東京に移住し、書物や別刷りを資料館に寄付する。

【1973年】 ZUMT 52888–52986 (99 標本)

佐藤が資料館の助手に就任。

【1974年】 ZUMT 52987–53507 (521 標本)

田中が死去。黒田長礼が弔詞を述べる。

【1976年】 ZUMT 53954–53987 (34 標本)

佐藤が臨海実験所の助手を兼任。

【1977年】 ZUMT 53988–54152 (165 標本)

阿部が東海区水産研究所資料部を退職し、海洋水産資源開発センターに就職する。

【1978年】 ZUMT 54153–54181 (29 標本)

田中生誕 100 年の集いが開催される。司会は阿部、追悼談が富山、石田、阿部、青山 茂により述べられる。佐藤がフエフキダイ科魚類の研究で学位を取得する。

【1981年】 ZUMT 54246-54413 (168 標本)

1月に富山が勲三等瑞宝章を受賞し、富山先生を囲む会が開催される。3月8日に富山が死去。阿部が築地おさかな普及センター資料館館長に就任し、午前中は資料館に滞在、午後は築地おさかな普及センター資料館で勤務するようになる。

【1983年】 ZUMT 54414-54415 (2 標本)

藍澤正宏が富永事務所に就職し、技術補佐員として資料館に勤務する。富永は月の半分の週末に資料館を訪問する。

【1984年】 ZUMT 54416-54590 (175 標本)

富永、藍澤によりタイプカタログの作成が開始される。

【1985年】 ZUMT 54591-55268 (678 標本)

藍澤が2月から5月にニュージーランドへ出張、多数の標本を持ち帰る。資料館に新館が増設され、富永主導により標本室、研究室が現在の場所に移動される。

【1989年】 ZUMT XXXX-XXXX (XXX 標本)

坂本一男が富永事務所に就職する。

【1990年】 ZUMT 58920-59755 (836 標本)

坂本が資料館の客員研究員となる。

【1991年】 ZUMT 59756-59791 (36 標本)

藍澤が富永事務所を退職する。

【1993年】 ZUMT 59873-59879 (7 標本)

藍澤が千葉県立中央博物館分館 海の博物館に就職する。

【1994年】 ZUMT 59880-59883 (4 標本)

白井 滋が富永事務所に就職し、ツノザメの研究をおこなう。長田美子により標本台帳の電子化が始められる。富永が死去。

【1996年】

東京大学総合研究資料館が東京大学総合研究博物館となる。阿部が死去。

【1997年】

坂本が築地おさかな普及センター資料館館長に就任する。

【2010年】

黒木真理が東京大学総合研究博物館マクロ先端研究発信グループ助教に赴任する。

【2012 年】

黒木真理が任期満了につき退職。

【2021 年】

小枝圭太が東京大学総合研究博物館マクロ先端研究発信グループ助教に赴任する。外部研究者、学外ボランティアの補助により ZUMT 標本カタログの製作を開始する。

ZUMT 魚類標本に関わった人物

現在までに ZUMT 魚類標本の収集、管理、寄贈など関わった人物は 1000 名を超える。これらのうち一部の人物について ZUMT 標本との関わりも含めて以下に列挙する。

—ZUMT 標本の収集・管理に関わった人物—

【田中茂穂 Shigeho TANAKA】(1878–1974 年)

1878 年に高知で生まれ、1901 年に東京帝国大学理学部動物学教室に入学し、1903 年より魚類の研究を始める。きっかけは 1901 年に大阪で開催された内国勸業博覧会に展示された鹿児島産の魚類標本 259 点の同定を動物学教室の 3 代目教授の箕作佳吉からすすめられたことによる。在学中は箕作および 4 代目教授の飯島 魁に師事する。1904 年に大学院進学にともない ZUMT 魚類標本の収集を開始し、1930 年代にかけて魚類標本提供のネットワークを構築する。東京帝国大学理学部動物学教室の 8 代目教授。田中による近代的な魚類学への取り組みは米国スタンフォード大学の D.S. Jordan の影響を強く受けており、日本において体系的に魚類のコレクションを収集・管理をおこなった初めての人物といえる。1913 年には Jordan とその弟子の John Otterbein Snyder との共著で 1235 種の魚類を収録した「A catalogue of the fishes of Japan (日本産魚類目録)」を出版し、日本の魚類学の基礎を築いた。1926 年から 1927 年には当時学長だった Jordan に呼ばれてスタンフォード大学に留学、滞在中は Jordan より家族同様の待遇を受けたと残している。この留学を機に、スプリッター (種を分けけることを好む) からランパー (種をまとめることを好む) へと意識が変わったことも記されている。田中は生涯で約 300 編の研究論文と 50 冊にも及ぶ書籍を出版しており、これらのなかにはギンザメ類をはじめとして約 170 種の新種の記載も含まれるが、ランパーとなり自身で同種異名とした種もある。また、日英併記で日本産魚類を記載する「日本産魚類図説」を 1911 年から 1931 年まで出版し、その費用のほとんどを自費で賄った。1913 年には魚学雑誌を刊行し、月刊誌として魚類をはじめとする幅広い水生生物の研究結果発信に努めたが、7 号を出版したのち同年中に廃刊となる。標本収集の際には、産地情報を記録することを徹底し、現場で方言名などをタグに記録して結び付け、市場で購入した標本であっても産地を記録することに注力した。「産地なきものは標品としての価値大半消失す」とまで述べている。淡水魚、海水魚を問わず、川や海岸において自身でも各地で採集をおこなうとともに、地元の子供や釣り人などに依頼して収集をおこなった。日本中から集めた魚類標本とその産地情報に基づき、1931 年に学位論文「On the distribution of fishes in Japanese waters (日本産魚類の分布)」を出版している。この論文は日本列島の海水魚の生物地理学

的特性を論じた初めての論文であると同時に、現在の知見においても通じる極めて先進的な論文であったといえる。1939年に定年退官後はご子息の住む北海道や高知、水戸、伊豆で暮らし、1967年に上京した。この間、ZUMT 標本に関わった痕跡はないが、弟子である富山一郎や蒲原稔治とは関係が続いたようである。人柄については、各書に残された文字より推察するに、権威的とは真逆であり、自身と同じく魚類（あるいは生物や自然現象）に興味をもつ人間には分け隔てなく接していた様子がうかがえる。例えば、1935年に出版された田中著の「魚の随筆」のなかで、「高等学校の学生増田君（のちの門下生である増田繁雄）の採集方法は中々面白い。」として、その方法を紹介しているが、帝国大学の助教授が高校生の採集方法に興味をもつ姿は田中の純粋さが現れているように感じられる。一方で、実直な性格なため、目上の人であっても齒に衣をきせず持論を述べて周囲を驚かせる場面もあったという。一方で、高知県尋常中学校（現在の高知追手前高等学校）に在籍時のちの物理学者である寺田虎彦と同級生で親交があったが、寺田が主席を続けていたため、田中は敗北感から五年生の時にうつ病を病んだことが残されている。また、第一高等学校に進学した後も、眞鍋嘉一郎ほか秀才に圧倒され、うつ病が再発し、一年間休学したことも記されている。成人後はこれを克服し、全く無縁であったとされる。寺田や眞鍋のほか、同郷の植物学者である牧野富太郎や動物学教室の先代教授となる谷津直秀、鳥類学者の黒田長礼などと親交が厚かった。最も美味しい魚はイワシとし、ビールは好まず日本酒を好んだ。ただし酒に強くはなく、富山一郎の結婚式で泥酔し、富山自身が車で自宅まで送り届けたという逸話もある。1974年12月24日に逝去。ZUMT 標本台帳の記録によると、田中自身が収集した標本は1270標本と全体の4番目であるが、採集者として名を記していない場合も多く、実際にはさらに多くを収集していると推察される。

【富山一郎 Ichiro TOMIYAMA】（1906–1981年）

1906年に釜山で生まれ、中学までを釜山で過ごした。高校から鹿児島島の七高（第七高等学校造士館）、1927年に東京帝国大学理学部動物学教室に入学した。田中茂穂の最初の弟子として卒業論文より魚類の研究を始め、修士以降のテーマである日本産ハゼ類に関する研究は、国内におけるハゼ類研究の礎となった。戦前は1931年より有明海や富山湾に採集紀行として訪問し、多数の標本を収集しているほか、1930年以降、ZUMTの標本登録を田中より引き継ぎ、田中が収集し、未整理・未登録のままとされていた標本の登録作業を精力的に進めた。1937年に学位を取得し、上海自然科学研究所に赴任する。上海でも精力的に研究し、揚子江（長江）などから多数の標本も収集したが、終戦に伴い研究成果も含めたこれらすべてを置いて帰国せざるをえなかったため、そのほとんどは世に出ていない（富山 1953）。戦後は東京大学理学部附属三崎臨海実験所などで勤務する傍ら、ZUMT 標本の整理にあたった。また、当時の昭和天皇の御研究のお相手をつとめるとともに、当時の皇太子殿下（現在の明仁上皇陛下）のハゼ科魚類の御研究の助言者、相談役でもあった。富山は「魚が好きでたまらない」とか「分類学に大きな興味と抱負をもって」といった情熱的な性分ではなく、田中の情熱に引きずられるように魚類の分類学の道へ進んだことが本人によって記されている。ただし、標本の収集に興味がなかったわけではなく、初めて行った富山湾や有明海の調査は「非常に楽しかった」と記しており、戦後も五島列島に赴き多数の標本を収集するなど、収集活動も精力的におこなった。1961年には1年間

サラワクに出張し、サラワク博物館より標本の寄贈を受けている。1967年に九州大学天草臨海実験所に赴任して以降は、ZUMTの魚類標本には関与しなくなったようである。1981年3月9日に逝去。富山が収集した標本は2787標本とZUMT標本台帳のなかで最多である。

【阿部宗明 Tokiharu ABE】(1911–1996年)

1991年に東京で生まれ、1919年にご家族とともに台湾に移住、そこで台北高等学校に進学、卒業し、1932年に東京帝国大学理学部動物学教室に入学した。卒業論文より田中茂穂の弟子としてフグ類の研究を始め、1935年に修士課程に進学、1940年に修了。戦前は富山とともにZUMT標本の管理や標本室の移動にも尽力した。1936年冬から1937年にかけての1年間パラオ熱帯生物研究所に滞在し、376種2600標本を収集して持ち帰りZUMTに収蔵した(ZUMT ABE 2700–6000番台前半と推察される)。このうち水産種の多くはバベルトゥアップ島の南岸で日本人漁業者が網で漁獲したものであり、非水産種についてはパラオ中部の島で採集したものである。これらパラオ産標本のほか、1970年代まで標本を収集しているものの、阿部が収集した標本のほぼ全ては、標本タグの標本番号に下線を付した個人コレクションとして管理されており、また、これらに対応した標本台帳にあたるノートの大部分が紛失している。このため、現在では採集地などの情報が不明であるものが多数を占めていることは誠に残念である。これらの多くは、ZUMT標本庫内にZUMT標本と混在して保管されているため、本目録内ではZUMT ABE XXXXXとして扱っている。戦後は、1947年より農林省東海区水産試験場に農林技官として任官された。このころの遠洋調査において太平洋の広域から収集された標本はZUMTに登録され、その一部は新種として報告されるなど極めて貴重である。1952年には「日本近海産マフグ科魚類の分類学的研究」により学位を取得。1977年に同試験場を退職すると、1981年からは築地おさかな普及センター資料館の館長となり、1996年に逝去するまでのあいだ、同資料館とZUMT(当時は東京大学総合研究資料館に移っていた)を行き来しながら研究を続けていたという。阿部が収集し、ZUMTに登録した標本は204標本と少ないが、これには数千あるいは数万にもおよぶ阿部の個人標本(目録ではZUMT ABEとして扱った)は含まれていない。

【蒲原稔治 Toshiji KAMOHARA】(1901–1972年)

1901年に高知で生まれ、1923年に東京帝国大学理学部動物学教室に入学した。卒業研究では魚類を扱わなかった蒲原は、1926年に同大学を卒業後、1928年より高知高等学校の教授となり、魚類の分類学的研究を開始する。これ以降、高知産の魚類標本が頻繁にZUMTに登録されるようになり、また、1935年以降は田中茂穂に師事して、1939年に学位を取得する。それ以降はZUMTへと高知の標本を送ることはほとんどなくなったものの、1949年に高知大学文理学部教授となり、岡村 収や尼岡邦夫など数々の魚類学者を輩出する日本有数の魚類分類学研究室を作りあげた。蒲原により提供された標本は640標本であり、そのほとんどが高知産。

【犬尾三郎 Saburo INUO】(1910–1945?年)

阿部宗明の1歳年上であった犬尾は、阿部より1年遅い1935年に田中茂穂の門下生となった。犬尾は卒業研究でベラの研究を始め、1936年と1937年には沖縄島に採

集紀行で赴き、ベラ科魚類をはじめとする多数の標本を収集している。ホンベラの性的二型に関する論文などを残しているが、太平洋戦争でフィリピンにて戦死した。犬尾が門下生となる前年の 1934 年に佐賀県藤津郡の犬尾文郎より多良川産のチチブやエドハゼの標本が ZUMT に提供されていることや、犬尾姓が全国的にも珍しい苗字であることを考慮すると、犬尾文郎と犬尾三郎の親縁である可能性が高い。犬尾三郎により提供された標本は 665 標本であり、そのほとんどが沖縄産で一部が神奈川など関東産。

【石田寿老 Jyuro ISHIDA】(1908–1994 年)

島根県出身で 1929 年に東京大学理学部動物学教室に入学した。卒業研究では魚類分類学を扱わなかった石田は、1932 年に卒業後、三井海洋生物学研究所で勤務する。この頃に収集した標本を ZUMT に提供した。また、三井海洋生物学研究所のラベルが付いた標本瓶が ZUMT 標本庫内に未整理で置かれており (2022 年現在、順次登録を進めている)、これらの標本は同研究所が閉所となる際に石田によって引き取られたものであると推察される。1935 年より 1 年ほど樺太に滞在し、収集したサケ目の標本を持ち帰り ZUMT に登録した。1936 年より田中の門下生としてこれらを用いた研究をはじめめるが、のちに研究対象は変わり 1945 年に「淡水魚(メダカ)の孵化酵素に関する研究」で学位を取得する。以降、東京帝国大学理学部動物学科で助教授と教授を務めるが、樺太の標本を登録したのちは、ZUMT に標本を登録していない。石田により提供された標本は 773 標本であり、そのほとんどが樺太産または三井海洋生物学研究所在籍時に提供された静岡県産。

【増田繁雄 Shigeo MASUDA】(1917?–1945?年)

1929 年、当時中学生であった増田は田中に標本を提供するなど懇意にし、研究室への出入りも許可されていた。高等学校在籍時には三崎に数日間滞在して、土地の漁業者と懇意となり、価値のない混獲物の提供を受けるという方法で標本を収集したという。太平洋戦争のさなか、上海自然科学研究所に富山を訪ねた記録が残されているが、その後には戦死した。

【富永義昭 Yoshiaki TOMINAGA】(1936–1994 年)

1955 年に福岡県立修猶館高等学校を卒業後、東京大学理学部生物学科に入学、修士課程に進学し、三崎臨海実験所の教授であった富山一郎の弟子としてハタンポ科魚類やキンチャクダイ科魚類の解剖に基づく分類と系統や幅広い魚種の鰓の形態に関する研究をおこなった。1963 年には博士課程を中退し、三崎臨海実験所の助手に就任する。1966 年に家業である天洋水産、福岡運輸、福岡倉庫、横浜海運、富永事務所、札幌低温運輸などの株式会社で社長業を営むため、助手を退任する。以降、理学部の非常勤講師として研究を続け、ZUMT 標本の収集と管理もおこなった。月の前半を福岡、後半を東京で過ごす生活であったため、月の後半の休日には東京大学総合研究資料館で研究や標本の整理をする超人的なハードワーカーであった。1968 年には学位論文「ハタンポ魚類の分類と形態」を出版して学位を取得する。大学院進学以降、三崎周辺や奄美大島などで自身でも魚類標本を収集し、福岡の市場や家業である天洋水産がおこなう東シナ海での底曳網漁によって収集された魚類を数多く収集・登録している。また、当時の東京大学が所有していた白鳳丸や淡青丸などの調査船の航

海に同上して魚類標本を収集している。1983年以降は富永事務所の秘書として藍澤正宏や坂本一男、白井 滋を雇用し、ZUMT 標本の管理や自身の研究の補助にあてた。さらに私財を寄付金として資料館に入れ、標本瓶や薬品を購入するだけでなく、当時としては革新的なコンピューターによる標本管理システムを構築するとともに、元東京大学理学部で事務員を務めた長田美子を雇用して標本台帳のエクセルデータ化や文献のデータベース化を進めた。標本を永続的に管理するための保存瓶にも工夫を重ね、蓄電池用のガラス水槽を大型標本の保存容器として使用するなど、現在の標本庫の管理体制の土台を作り上げた。1984年より藍澤とともに ZUMT タイプカタログの製作に取り掛かるも、1994年に57歳で逝去。富永により採集、提供された標本は664標本だが、採集者として名を記していない場合も多く、実際にはさらに多くを収集していると推察される。

—ZUMT に標本を提供した人物—

【赤松邦太郎 Kunitaro AKAMATSU】

1907-1909年まで台湾総督府中学校教諭として勤務する。台湾赴任の前にはシロウオの文化的研究をおこない、箕作佳吉や渡瀬庄三郎と交流があった。帰国後は1921年に広島高等師範学校、1925-1926年に高知高等学校に勤務した。高知県沖の島で1926年に採集した標本を蒲原稔治経由で ZUMT に提供しており、両名の交流が伺える。台湾をはじめ、高知、愛媛、長崎などで標本を収集し、50標本を ZUMT に提供した。

【青木熊吉 Kumakichi AOKI】(1863-1940年)

神奈川県三崎出身の漁師であり、1886年に東京大学の三崎臨海実験所が開所して以降、研究者の海洋生物採集を手伝い、箕作佳吉以降の多数の研究者たちと関わりながら海洋生物の採集に従事した。優れた操船や採集能力をもち、深海生物を含む数多くの生物を採集、提供して研究者たちを支えた伝説のハンターで、「熊さん」の愛称で親しまれた。1898年には採集人として臨海実験所に雇用され、1925年に定年退職した。ZUMT 標本台帳によると、青木は田中茂穂（東北地方：1906年）、飯島 魁（フィリピン、シンガポール：1909-1910年）、岡田弥一郎（利島：1920年）と採集紀行に出ているほか、相模湾産の魚類を多数提供している。青木によって提供された標本は合計で525標本。青木個人が収集した標本には短冊状の小さな紙タグに学名、産地、「熊」あるいは「くま」と書かれていることが多く、未登録の標本も散見される。

【青木尅雄 Takeo AOKI】(1887年生まれ)

1910-1912年にかけて静岡県水産試験場の技師として静岡県浜名湖周辺で収集した標本を提供し、この一部を報告した。1915年より台湾総督府中央研究所の大島正満の助手として、台湾の淡水魚類の研究を開始し、1917年にはタイワンマスを発見した。その後も1944年まで台湾の台北、台南、基隆の水産試験場で技師として勤務し、淡水魚、海水魚を問わず数多くの標本を ZUMT に提供した。青木によって提供された標本は495標本にのぼる。

【蜂須賀正氏 Masauji HACHISUKA】(1903–1953 年)

旧徳島藩主蜂須賀家の第 18 代当主で鳥類学者。黒田長礼の影響で鳥類学者となり、1921 年イギリスのケンブリッジ大学に入学。鳥類採集のため世界中に採集紀行をおこない、フィリピンのミンダナオ島南部アポ山の登頂に初めて成功した。同採集紀行の過程で立ち寄ったザンボアンガの市場で収集した魚類標本を ZUMT に提供した。岡田弥一郎とともに渡瀬庄三郎に働きかけ、日本生物地理学会を設立した。鳥類の分布の違いに基づき、沖縄諸島と八重山諸島間の生物地理区の境界（蜂須賀線）を発見した。

【羽根田彌太 Yata HANEDA】(1907–1995 年)

岐阜県大垣市出身で、分類群を問わず発光生物の研究を幅広くおこなった。1937–1942 年にかけて、南洋パラオ熱帯生物研究所の研究員として 4 回出張し（うち 1940 年までに 2 回）、その間にフィリピン、ボルネオ、ラバウルにも出張した。1942–1945 年には昭南博物館（現在のシンガポール国立博物館）に副館長として勤務するかたわら、マレーシア、ジャワ、セレベスにおいても研究を進めた。戦後は 1955–1974 年まで横須賀市博物館館長を務め、東南アジアを中心に発光生物の研究を続けた。ZUMT には 1935–1938 年にパラオで、1937 年にボルネオ島で収集したものを中心に 176 標本が提供された。

【Albert William HERRE】(1868–1962 年)

アメリカのスタンフォード大学の魚類研究者で、1930 年前後にフィリピン産の魚類を多数 ZUMT に提供した。Herre によって提供された標本は 120 標本。

【星野伊三郎 Isaburo HOSHINO】

和歌山県粉河中学校や海南中学校に勤務し、1914–1925 年にかけて同県で収集した魚類を ZUMT に提供した。また、大分県宇佐中学校にも勤務し（時期不明）、同県の魚類も提供した。星野によって提供された標本は 297 標本。

【飯島 魁 Isao IJIMA】(1861–1921 年)

静岡県浜松出身で、東京帝国大学理学部動物学教室にて初代教授の Edward Sylvester Morse の弟子となる。Morse の弟子として、佐々木忠次郎とともに日本人として初めて発掘調査をおこない、茨城県三浦村の陸平貝塚を発見した。寄生虫学を中心として海産生物の研究をおこなうとともに、国内外の採集紀行で得た標本を ZUMT に提供した。1906 年に北海道から樺太へ採集紀行をおこなった。1909–1910 年には青木熊吉とともにフィリピンのマニラおよびホロ、インドネシアのバタビア（現在のジャカルタ）、シンガポールまで採集紀行をおこない、数多くの標本を持ち帰った。飯島によって提供された標本は 359 標本。

【今井倭武 Masatake IMAI】

1929–1930 年にかけて台湾の台北医学専門学校に勤務し、台北近郊の魚類を数多く ZUMT に提供した。台湾に赴任する以前は新潟県に在住し、1923 年に新潟県で採集された多数の標本を提供した。戦後は愛知学院大学の歯学部で教鞭をとった。今井によって提供された標本は 228 標本にのぼる。

【勝木重太郎 Jyutaro KATSUKI】

北海道水産試験場室蘭支所に勤務し、1913–1925 年にかけて北海道（主に室蘭産）で収集した標本を多数提供した。勝木によって提供された標本は 418 標本。

【金子一狼 Ichiro KANEKO】

長崎市の医師であり、博物学者。鉱物、植物、貝類、魚類などを収集した。長崎産魚類の分布および方言の調査をおこない、長崎で得られるサメ類、ホウボウ科、ニベ科の方言について報告した。ZUMT には 1908–1929 年（ほとんどは 1915 年以前）に長崎で収集した海水魚標本を提供した。金子によって提供された標本は 343 標本。金子が収集した標本には「産地 長崎、採集 ○○月」と書かれた状態の良い大きな紙タグが同封されていることが多い。

【片山正夫 Masao KATAYAMA】

広島県広島市に在住し、1930–1933 年に瀬戸内海で採集されたキセルハゼ *Gymnogobius cylindricus* (Tomiya, 1936) のホロタイプを含む魚類を ZUMT に提供した。また、1934 年には沖縄島糸満で採集した複数の標本も提供した。

【河上才次 Saiji KAWAKAMI】

熊本県立高等女学校で教鞭をとり、熊本市場や有明海において主に水産種収集した。これらの標本に基づき、熊本でみられる魚類とその方言について報告した。ZUMT には 1911–1916 年にかけて収集された 86 標本を寄贈した。

【加藤光次郎 Kojiro KATO】（1906–1981 年）

東京帝国大学を卒業後、1932–1941 年にかけて三井海洋生物学研究所で石田寿らと勤務して、エボシダイとカツオノエボシに共生関係がないことなどを研究した。ヒラムシなど幅広い分類群を研究対象とし、生涯を通じて 111 の新種および 11 の新属を発表した。ZUMT には三井海洋生物学研究所時代に収集したと思われる下田付近で採集した 19 標本を提供している。採集年は記録されていないものの、標本番号から加藤が研究所を退所した翌年に受け取ったものであると推察できる。

【菊池勘左衛門 Kanzaemon KIKUCHI】（1895–1980 年）

新潟県佐渡出身。1918 年以降、富山県魚津中学校や高岡中部高等学校で勤務し、富山湾の貝類研究をおこなうとともに、富山湾産の魚類標本も数多く提供した。また、1920 年に佐賀県立佐賀中学校で勤務した際に収集した佐賀県産の主に淡水魚の標本も ZUMT に提供した。菊池によって提供された標本は 380 標本。

【木下盛枝 Morie KINOSHITA】

福岡県柳川市にあった柳河高等女学校（現伝習館高等学校）で教鞭をとり、魚類や植物の標本を収集していた。戦前に収集した標本の大部分は ZUMT にあり、これらの標本をもとにして 1933 年には『柳河ノ淡水魚』をまとめている。木下の標本は京都大学の旧大津臨湖実験所の標本群にも少数含まれており、戦後は九州大学の内田恵太郎、塚原博両氏に協力し多数の標本蓄積に貢献した。

【黒田長礼 Nagamichi KURODA】

旧筑前福岡藩黒田家の14代目当主で鳥類学者。渡瀬庄三郎に師事する。田中茂穂と親交が深く、黒田自身による収集のみならず黒田経由で田中へと提供された標本も多い。田中によって記載されたクロダハゼ *Rhinogobius kurodai* (Tanaka, 1908) は都内に所在した黒田邸の池から発見されたことに因む。黒田によって提供された標本は605標本。

【黒岩 恒 Hisashi KUROIWA】 (1858–1930 年)

高知県出身で1892年に沖縄尋常師範学校に赴任、1920年に和歌山へと転居するまでの間、沖縄県内の複数の学校で教鞭を執りながら、沖縄の動植物を研究した。1897年には尖閣諸島に渡り、島々を調査して「尖閣諸島」を命名したことで知られる。1912–1923年にかけて与那国島ら種子島にかけて琉球列島の広域で数多くの魚類を収集して、ZUMTに提供した。これらの標本に基づき Jordan & Tanaka (1927) は「The Fresh water fishes of the Riukiu Islands, Japan」を出版し、黒岩自身も同年「琉球島狐に於ける淡水魚類採集概報」として各島における地方名や島ごとの分布情報とともに報告した。また、黒岩によって採集された標本に基づき、田中は複数の淡水魚を新種として記載した。黒岩により ZUMT に提供された標本は573標本にのぼる。

【桑野久任 Hisatada KUWANO】 (1876 年–)

ギボシムシ類の研究をおこない、1901年に東京帝国大学理科動物科を卒業し、大学院へ進学する。1904年に同大学の助教授に就任し、在官のまま清国の北京大学の教授として招聘される。1910年には奈良女子高等師範学校の教授となっていることから、ZUMT 標本台帳に記録された清国産の標本は1904–1910年のあいだの北京大学での勤務時に収集したものである可能性が高い。なお、ZUMT には1898年に中国の白羊淀産で採集された標本が京師大学堂師範館動物学教室に在籍した桑野より提供された記録がある。桑野によって提供された標本は、一部、鳥羽や信州松本、吉野川などの国内産であるものの、大部分は清国あるいは満州国産と記録されている。後者については、1932–1945年に採集されたものであろう。

【前川善四郎・鈴木貞次郎 Zenjiro MAEKAWA and Tejiro SUZUKI】

1955–1957年にかけてインド洋や太平洋といった海外産の標本を数多く提供した。彼らによって収集、提供された標本は277標本。

【松崎明治 Meiji MATSUZAKI】 (1898–1950 年)

鹿児島県知覧町生まれ、早稲田大学美術科・哲学科卒業。1929年から1942年まで朝日新聞社文化部で釣魚欄の担当記者として活躍した。1938年には『釣百科』、1939年には『写真解説 日本の釣』、1942年に『釣技百科』を相次いで刊行した。松崎の著書は学術的視点を含み、また鮮明な写真も含むことから民俗資料としての価値も高く、類書は他にない。松崎は朝日新聞記者の時代から魚類研究者と親交があり、1942年に朝日新聞を辞め故郷に戻ってからも東京大学や九州大学から研究委託を受けて自宅で魚類標本を作成していた。ZUMT には朝日新聞記者時代の2標本のみが登録されているが、九州大学には数百点の標本が現存する。

【宮代周輔 Shusuke MIYASHIRO】(1888–1969 年)

神奈川県大磯出身の植物研究者で、横浜工業学校および東神奈川工業学校において教鞭をとった。横浜市を中心に神奈川県内、国内各地、遠く中国東北部や朝鮮半島北部で植物や鳥類の標本を収集したことが知られているが、ZUMT には神奈川県産の魚類 107 標本を提供している。

【中原綱作 Tsunasaku? NAKAHARA】

三重県富田中学校、三重県尾鷲町尾鷲高等女学校ならびに三重県三重郡富田町県立第二中学校で教鞭をとった。採集年月日は不明なものが多いものの、一部の標本は 1916–1919 年にかけて収集されている。三重県における地方名とともに同県産の 97 標本を ZUMT に提供した。

【丹羽 彌 Hisashi NIWA】(1899–1984 年)

岐阜師範学校を卒業。愛知県立名古屋第一高等女学校、岐阜県立中津高教諭などを経て、1941 年より聖徳学園女子短大教授として勤務する。木曾川水系の魚類を研究し、アジメドジョウを新種として記載した。丹羽により岐阜県や愛知県の淡水魚 50 標本が ZUMT に提供された。

【岡田彌一郎 Yaichiro OKADA】(1892–1976 年)

石川県加賀市出身で、東京帝国大学で博士号を取得、東京高等師範学校、三重水産専門学校、三重県立大学等の教授を務め、定年後は東海大学教授、日本魚類学会の初代会長などを歴任した。魚類、爬虫類、両生類の分類学的研究をおこなった。1915 年には、五島清太郎に随伴してパラオを訪問しているが、ZUMT への標本提供はない。1924 年には渡瀬庄三郎とともに、朝鮮半島産の両生類、爬虫類、魚類（主に北部産の淡水魚）の標本を収集し、これらを含む 117 標本を提供した。

【大恵尚一 Shoichi OOE】

静岡県浜松市高等魚学校において教鞭をとり、魚類の標本を収集していた。浜名湖において数多くの魚類を収集し、ZUMT には 169 標本を寄贈した。

【大島正満 Masamitsu OSHIMA】(1884–1965 年)

北海道札幌出身で、東京帝国大学を卒業後、台湾総督府中央研究所に 1907–1924 年にかけて勤務した。その間、1917 年にはアメリカのスタンフォード大学に留学し、D. S. Jordan に師事し、留学中に青木尠雄が発見したタイワンマスをも Jordan と共著で発表した。淡水魚を主として台湾と奈良産の 72 標本を ZUMT に提供した。筆名は尾島鳥秋。

【押津義雄 Yoshio OSHIZU】

八丈島三根村に在住し、1929 年に採集された同島産の魚類 202 標本を提供した。八丈島周辺で活動する漁師あるいは篤志家であると推察される。

【坂口総一郎 Soichiro SAKAGUCHI】（1887–1965 年）

和歌山県出身の生物学者で、1920 年代に沖縄県立第一中学校として働くかたわら、沖縄県産の主にサンゴ礁性魚類や淡水魚の標本を数多く提供した。1918–1920 年まで所属した和歌山県海草中学校、1925 年以降に赴任した和歌山師範学校時代には和歌山県産の標本も ZUMT に提供した。沖縄在住時には沖縄島や離島を含めたさまざまな地域の写真や記録を残しており、昆虫や植物をはじめとする沖縄の自然誌研究を幅広くおこなった。坂口により ZUMT に提供された標本は 1446 標本にものぼる。

【佐藤春吉 Haruyoshi SATO】

台湾の基隆中学校において教鞭をとり、台湾産の魚類標本を収集した。台北や基隆のみならず日月潭においても魚類を収集し、ZUMT には 166 標本を寄贈した。

【瀬能 宏 Hiroshi SENOU】

神奈川県立生命の星・地球博物館の現学芸員。博士課程では沖山宗雄に師事し、東京大学総合研究博物館（水産動物部門）で過ごした。藍澤らと共に西表島産魚類を中心に 1000 標本以上を採集した。

【多田綱輔 Tsunasuke TADA】

1896–1897 年にかけて、東京帝国大学理学部から台湾へと派遣された。台湾で動物の標本を収集した初めての日本人であり、ZUMT にも彼が 1890 年代に台湾の各地で収集した 52 標本が提供されている。

【田辺貞夫 Sadao TANABE】

1914–1924 年にかけて青森、秋田、岩手といった東北地方沿岸で採集された標本を多数 ZUMT に提供した。1925 年以降、沖縄へ渡り、恩納村や今帰仁村運天、那覇などから数多くの標本を提供した。田辺により提供された標本は 1340 標本。このほか比屋根良隆と共に那覇で収集した 317 標本も提供した。

【鳥羽源蔵 Genzo TOBA】

岩手県師範学校や岩手県盛岡師範学校で勤務した博物学者。同県の植物や昆虫を中心に数多くの標本を収集し、1897–1934 年にかけて収集された魚類標本が ZUMT に提供された。鳥羽によって提供された標本は 300 標本。

【角田春斉 Haruhito TSUNODA】

福島県磐城郡小名濱小学校の教員。1931–1933 年にかけて採集した福島県産の 92 標本を ZUMT に提供するとともに、地方名や珍しさについての情報も提供した。

【内山 操 Misao UCHIYAMA】

八丈島に在住し、内山芳五郎（あるいは吉五郎）とともに 1921–1922 年にかけて採集された同島産の魚類 362 標本を提供した。1 標本のみ小笠原諸島父島産の標本も提供されており、八丈島周辺で活動する漁師あるいは篤志家であると推察される。

【内山柳太郎 Ryutarō UCHIYAMA】

明治時代の貝類学者であり、1904–1916 年にかけて本邦産貝類図説を連載した。ZUMT には 1906–1912 年にかけて淡路島福良で採集した魚類標本を提供していることから、貝類採集の傍ら収集した魚類を田中茂穂に提供していたことが推察される。内山により 113 標本が提供された。

【宇井縫蔵 Nuizo UI】(1878–1946 年)

和歌山県出身の生物学者で、田辺小学校や田辺高等女学校で教員として勤務し、1912–1921 年にかけて和歌山県産の標本を数多く提供するとともに、当時の地方名や普通か稀かなどの情報も残した。田中と頻繁にやり取りをし、1924 年には紀伊半島の魚類について詳細にまとめた「紀州魚譜」を出版する。宇井によって提供された標本は 666 標本。

【渡瀬庄三郎 Shozaburo WATASE】(1862–1929 年)

江戸生まれ、札幌農学校を卒業後、東京帝国大学理科大学動物学教室に入学し、箕作佳吉に師事する。1910 年より東京帝国大学動物学教室の第 5 代教授に就任。生物地理学を研究し、南西諸島の生物相調査の過程でトカラ列島に分布境界線が存在することに気が付き、1926 年にこれ発表した。この分布境界線は岡田弥一郎により「渡瀬線」と名付けられ、現在でも用いられている。日本生物地理学会の創立にも深く関わった。ZUMT には 1903–1912 年にかけて主に琉球列島や富山県滑川、対馬、台湾などから収集した 97 標本を提供した。

【八木貞助 Teisuke YAGI】(1879–1951 年)

長野県出身の地質学者で、長野師範、長野中学、長野高等女学校、伊那高等女学校、飯田高等女学校などの教諭を歴任した。田中が信州の淡水魚類の研究をおこなった際、その手伝いをした。ZUMT には長野県産の淡水魚 108 標本を提供しているが、一部の標本が 1921 年に採集されている以外の採集年は不明である。

【山村樞次郎 Umejiro YAMAMURA】(1865–1949 年)

【山村八重子 Yaeko YAMAMURA】(1899–1996 年)

鳥取県出身。1885–1897 年にかけてアメリカサンフランシスコにて歯科医を営む。1917 年よりフィリピンのバシラン島で 600 ha の椰子園を経営する。1925–1926 年にかけてバシラン島に滞在した二女である山村八重子と共にバシラン島、ミンダナオ島や近隣の地域・海域、フィリピン全土から多数の動植物（鳥、魚、虫、貝、サンゴなど）の標本を収集した。ZUMT に提供された魚類標本は淡水、海水を含む 633 標本にもものぼる。1926 年、膨大な量の生物標本とともに丹後丸にて日本へと戻る帰路の途中、フィリピン沖合の船上にてアポ山調査へと向かう蜂須賀正氏と出会った記録がある。山村が収集した標本には「山村樞次郎、フィリピン」と墨で書かれた布タグが付されていることがほとんどであり、ZUMT 標本台帳にも山村樞次郎の名で登録されているものの、山村八重子の手記には川で魚を採ったことが記されていることから、両名により採集されたものと考えるのが妥当である。山村樞次郎と山村八重子は 1936 年 10 月にはフィリピンのケソン大統領の招待を受けて国会的祭典に参列し、八重子は式後にバシラン島をはじめとする東南アジアを訪問した。この際にも鳥類、

昆虫類、貝類、魚類などを収集し、1937年3月にめきしこ丸で帰国している。魚類の採集は主に夜間に磯にいる魚を突いたと記録されている。この採集紀行で収集されたと考えられる標本は、1938年に山村樸次郎の名でZUMTに登録されている。狛江町の自宅には依然として多量の生物標本が保管されていたことが知られ、魚類標本のなかにはノコギリエイやテッポウウオをはじめバシランおよびザンボアンガ産の淡水魚、バシラン海峡およびスールー産の海水魚が含まれていたとされる。

【柳井隆一 Takaichi YANAI】

島根県松江高等学校で教鞭をとり、のちに島根大学文学部生物学教室に勤務して両生類、爬虫類、昆虫類、魚類の研究に携わった。島根県産の魚類303標本をZUMTに提供し、これをもとに1950年には山陰地方の魚類の分布境界についての論文を発表した。ZUMTへの標本提供や同定結果等の際し、田中茂穂、富山一郎、犬尾三郎と連絡を取っていた。

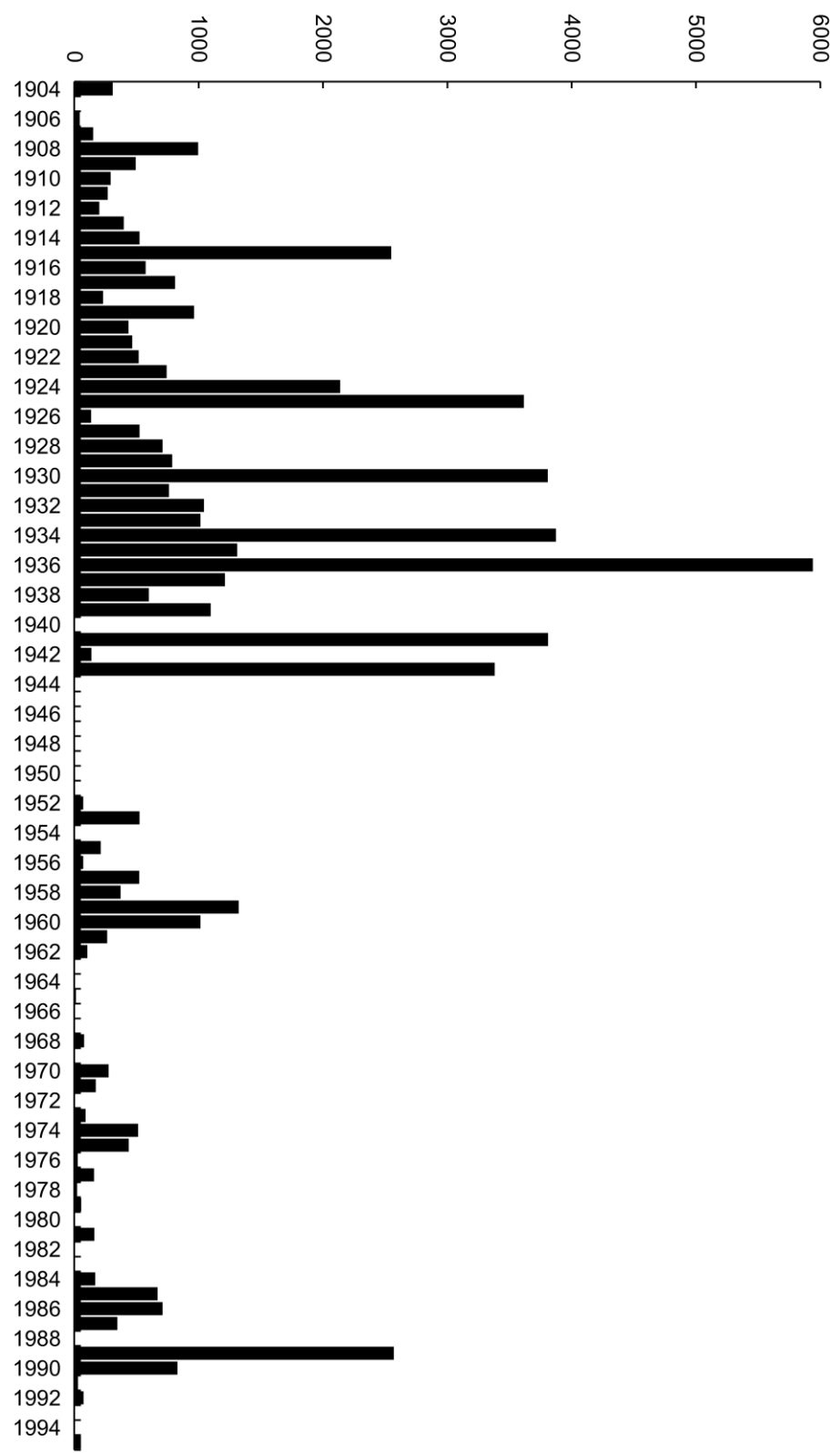
【屋代弘孝 Hirotaka YASHIRO】

沖縄県において昆虫類（主に害虫類）を研究した。沖縄島や八重山諸島において数多くの魚類を収集した。ZUMTには1924-1925年にかけて収集された沖縄県産魚類172標本を寄贈した。

【吉兼宗一 Soichi YOSHIKANE】

愛知県女子師範学校および名古屋市愛知女子師範での教鞭をとった。1925-1933年にかけて収集した愛知県産の66標本をZUMTに提供した。

Figure 1. Number of registered specimens in ZUMT in each year.



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

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Abstract

The collection of Lampridiformes (Teleostei) held in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT) comprise in total 46 specimens representing 12 species of four families. A holotype of *Trachipterus misakiensis* Tanaka, 1908 recognized in the collection (ZUMT 960), but could not find. A single specimen of unidentified species of genus *Desmodema* was discovered from the collection. The morphological information of the ZUMT lampriforms specimens observed in this study is described as more as possible.

Introduction

Lampridiformes comprises six families, Lampridae, Veliferidae, Lophotidae, Radiicephalidae, Trachipteridae, and Regalecidae. Although the family Stylephoridae has historically placed among Lampriformes, the recent study using the DNA sequence analysis revealed that the family is instead a close parent of the order Gadiformes (Miya et al. 2007; Dornburg and Near 2021). Most of the lampriforms fishes, except for Veliferidae, inhabit in pelagic deep sea, and rarely appear in the coastal waters. Five families, except for Radiicephalidae which only known from Taiwan in the western Pacific (Koeda and Ho 2018), have known from Japanese waters. Species of Lampridae and Veliferidae have dick-shaped bodies, and the other four families have ribbon-shaped bodies. Family Trachipteridae is the most species-diverse group in the order, and containing a lot of taxonomical confusions. Martin and Hilton (2021) taxonomically reviewed the family in the western Pacific, and recognized two species of both *Zu* Walters & Fitch, 1960 and *Desmodema* Walters & Fitch, 1960, and possibly five species of *Trachipterus* Goüan, 1770. They described the detailed morphology of two species of both *Zu* and *Desmodema*, however, could not show the morphological differences between the five species of *Trachipterus*, due to great ontogenetic variation and lack of specimen numbers on this taxon.

The fish collection of Lampridiformes (Teleostei) which preserved in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT) were re-identified in the present study. The morphological information of the ZUMT lampriforms specimens observed in this study is described herein to be a basic data for the future taxonomic studies on this group.

Materials and Methods

The specimens of Lampridiformes in ZUMT were re-identified in the present study, generally following Martin and Hilton (2021), together with Hayashi and Senou (2013) on the genus *Trachipterus*, and confirmation of at least one diagnostic character. The standard length (SL) of the specimens were measured for all specimens. Snout-vent length were also measured for most specimens because many specimens lacking caudal part of body. Vertebrae of some large-sized specimens were counted from computed tomography scans.

Species are arranged in alphabetical order by species name. Japanese were given in parentheses for local name and personal name when these are written in Japanese in the specimen ledger or tags. The list contains ZUMT number, SL, collection locality, collection date, collector or donator, collection method, and remarks when available. The collection year and collector for some specimens was estimated by following Koeda et al. (2022). Although, some of the ZUMT specimens collected by Dr. Abe had not been formally cataloged into the ZUMT collection (and the data of some specimens not retained), such specimens which can recognize by having underbar with the number on the accompanying label, are listed herein with the number ZUMT ABE XXXX, due to the possibility of future discovery of Dr. Abe's remaining catalog books with collection data.

Collection of Lampridiformes in ZUMT

Although ZUMT 960 is recognized as a holotype of *Trachipterus misakiensis* Tanaka, 1908, the specimen could not find from the collection. This species is regarded as a junior synonym of *D. polystictum* (Martin and Hilton 2021). Examination of the specimens of Lampridiformes deposited at ZUMT disclosed eight specimens of two species of Veliferidae, five specimens of two species of Lophotidae, 25 specimens of seven species (including two unidentified species) of Trachipteridae, and six specimens of a single species of Regalecidae.

The veliferids specimens of *Velifer hypselopterus* Bleeker, 1879 from Namerikawa, Toyama Pref. and *Metavelifer multiradiatus* (Regan, 1907) from Totoro, Nobeoka, Miyazaki Pref., represent the first records of the species from the prefectures, respectively. In addition, the specimens of *Desmodema lorum* Rosenblatt & Butler, 1977 from Okinose at off Tokyo Bay and Hachijo-jima Island represent the first records from each area. The morphology of a single specimen of *Desmodema* which collected from Hakodate, Hokkaido, differed from known two species of the genus. Further detailed comparison of specimens is needed for accurate identification of this specimen.

Veliferidae クサアジ科

Velifer Temminck & Schlegel, 1850 クサアジ属

Velifer hypselopterus Bleeker, 1879 クサアジ

ZUMT 9589: 108.1 mm SL, Kisyu-Tanabe (紀州田辺), Wakayama Pref., N. Ui (宇井縫蔵), good in condition.

Count characters: D II, 33; A I, 23; P₁ 16; P₂ 8.

ZUMT 45470: 127.8 mm SL, Namerikawa (滑川), Uwozu (魚津), Toyama Pref., I. Tomiyama, good in condition.

Count characters: D II, 33; A I, 23; P₁ 16; P₂ 8.

Remarks: The present specimen represents the first record of the species from Toyama Pref.

ZUMT 52194: 155.6 mm SL, Totoro (土々呂), Nobeoka (延岡), Miyazaki Pref., Aug. 1960, donated from Nankai Regional Fisheries Research Laboratory (南海区水産研究所), good in condition.

Count characters: D II, 33; A I, 23; P₁ 16; P₂ 8.

ZUMT 62268 [sketch no. 83 (写生第八十三号)]: 98.5 mm SL, locality unknown.

Count characters: D I, 33; A I, 23; P₁ 15; P₂ 8.

ZUMT 62271: 163.4 mm SL, locality unknown.

Count characters: D I, 33; A I, 23; P₁ 16; P₂ 8.

ZUMT ABE 59-653: 70.1 mm SL, locality unknown, good in condition.

Count characters: D I, 33; A I, 24; P₁ 16; P₂ 8.

ZUMT ABE 10180: 252.0 mm SL, Hatsu-shima Island (初島), Sagami Bay, Shizuoka Pref., 14 Jan 1955, T. Hirai (平井敏治), good in condition.

Count characters: D II, 33; A I, 25; P₁ 16; P₂ 8; LLs 72.

Metavelifer Walters, 1960 ヒメクサアジ属

Metavelifer multiradiatus (Regan, 1907) ヒメクサアジ

ZUMT 52195 (cloth tag of 118): 131.1 mm SL, Totoro, Nobeoka, Miyazaki Pref., Aug. 1960, donated from Nankai Regional Fisheries Research Laboratory (南海区水産研究所), good in condition.

Count characters: D XXIII, 21; A XVII, 18; P₁ 16; P₂ 9.

Remarks: Although Murase et al. (2021) reported 815 fish species in their fish faunal study around Nobeoka Miyazaki, this species was not reported. Therefore, the present specimen represents the first record of the species from Miyazaki Pref.

Lophotidae アカナマダ科

Lophotus Giorna 1809 アカナマダ属

Lophotus capellei Temminck & Schlegel, 1845 アカナマダ

ZUMT 39281: 255.2 mm SL, snout-vent length 231.0 mm, Gobou (御坊), Wakayama Pref., K. Okamoto (岡本 清) at Hidaka Wakayama Prefectural Junior Highschool (和歌山県立日高中学校).

Remarks: Skin of near anus soiled by black ink-like fluid. This may be evidence of that even these small-sized individuals can discharge ink-like fluid when alarmed.

ZUMT 62220: 1071.3 mm SL, snout-vent length 954.8 mm, off Cape Muroto, Kochi Pref., good in condition.

Count characters: D I, 233 (I, 172 before anus); A 22; P₁ 15; P₂ 0; C 5+9; GR 4+8; V 130.

Measurement characters: body depth 17.6% SL; head length 14.4% SL; snout length 24.9% HL; eye diameter 38.0% HL.

Eumecichthys Regan, 1907 テングノタチ属
Eumecichthys fiski (Günther, 1890) テングノタチ

ZUMT 22404: 650.1 mm SL, snout-vent length 593.0 mm, probably Japan (detail unknown), good in condition, donated from Yamakoshi Kosakusyo (山越工作所) to S. Tanaka.

Count characters: D 313 (280 before anus); A 7; P₁ 14; P₂ 0; C 11+1; GR 4+7.

Measurement characters: body depth 3.2% SL; head length 5.4% SL; snout length 25.0% HL; eye diameter 24.4% HL; preoral length 102.0% HL; pectoral-fin length 2.0% SL; caudal-fin length 4.8% SL.

Remarks: Skin of near anus soiled by black ink-like fluid.

ZUMT 39282: 1115.7 mm SL, snout-vent length 1105.3 mm, Gobou, Wakayama Pref., K. Okamoto at Hidaka Wakayama Prefectural Junior High School, probably stranded.

Count characters: D 313 (280 before anus); A 7; P₁ 14; P₂ 0; C 11+1; GR 4+7.

Measurement characters: body depth 4.1% SL; head length 6.3% SL; snout length 22.6% HL; eye diameter 24.0% HL; preoral length 89.1% HL; pectoral-fin length 2.2% SL; caudal-fin length 3.4% SL.

ZUMT 47824: 682.5 mm SL, snout-vent length 665.0 mm, probably Japan (detail unknown), good in condition, donated from Yamakoshi Kosakusyo (山越工作所) to S. Tanaka.

Count characters: D 310 (277 before anus); A 8; P₁ 14; P₂ 0; C 11+1; GR 4+6.

Measurement characters: body depth 9.1% SL; head length 16.7% SL; snout length 25.2% HL; eye diameter 23.5% HL; preoral length 102.8% HL; pectoral-fin length 5.7% SL; caudal-fin length 9.4% SL.

Remarks: The detail description and photograph. Japanese name of this specimen shown by Abe (1954). Although Abe (1954) mentioned that a single specimen of this species which collected near Hagi, Yamaguchi Pref. on Oct. to Nov. 1937, was donated from Ichiro Tanaka (田中市郎) to Shigeho Tanaka, the specimen may not deposited in ZUMT.

Trachipterus Goüan, 1770 サケガシラ属
Trachipterus fukuzakii Fitch, 1964

ZUMT 49052: 1661 mm SL, snout-vent length 791.5 mm, central North Pacific (28–30° N, 160° W), 100–150 m depth, water temperature 24°C, collected by M. Shinohara (篠原勝) boarded on training vessel of Toyama Prefectural Fisheries Highschool (富山縣立水産高等学校練習船), donated to I. Tomiyama (富山一郎).

Count characters: D 161 (73 before anus); A 0; P₁ 14; P₂ 0; C 6+2; GR 4+8; V 78; lateral-line scales 105; scales between lateral line and anus 31.

Measurement characters: body depth 14.0% SL; head length 14.2% SL; snout length 5.7% HL; eye diameter 25.2% HL; pectoral-fin length 6.1% HL; caudal-fin length 0.9% SL.

Remarks: A whole fish of probably *Anotopterus nikparini* Kukuev, 1998 (Anotopteridae) in the stomach could be observed from the X-ray.

Trachipterus ishikawae Jordan & Snyder, 1901 サケガシラ

ZUMT 62634: 1135.4 mm SL, snout-vent length 603.8 mm, Kagoshima, 1912.

Count characters: D more than 187 (84 before anus); A 0; P₁ 13; P₂ 5; GR 3+8.

Measurement characters: body depth 12.3% SL; head length 11.2% SL; snout length 40.8% HL; eye diameter 30.2% HL; pectoral fin length 4.6% HL.

Remarks: A cloth tag with “locality name unknown”.

ZUMT ABE 61-1213: 1576.7 mm SL, snout-vent length 716.0 mm, Manazuru (真鶴), Kanagawa Pref., Dec. 1961, T. Abe (阿部宗明).

Count characters: D 190 (79 before anus); A 0; P₁ 12; P₂ 0; GR 5+8; V 84; lateral-line scales 99; scales between lateral line and anus 25.

Measurement characters: body depth 11.1% SL; head length 13.0% SL; snout length 36.9% HL; eye diameter 27.1% HL; pectoral-fin length 5.0% SL; caudal-fin length 1.2% SL.

Trachipterus trachipterus (Gmelin, 1789) テンガイハタ

ZUMT 18854: 222.7+ mm SL, snout-vent length 155.0 mm, Kagoshima.

Count characters: D 82 before anus; A 0; P₁ 13; P₂ 6; GR 3+8.

Measurement characters: snout length 42.4% HL; eye diameter 31.3% HL.

ZUMT 62265: 82.1 mm SL, snout-vent length 54.6 mm, locality unknown.

Count characters: D 171 (76 before anus); A 0; P₁ 11; P₂ 6; C 8; GR 3+9.

Measurement characters: body depth 19.3% SL; head length 18.5% SL; snout length 27.9% HL; eye diameter 35.3% HL; pectoral-fin length 5.5% SL; pelvic-fin length 5.6% SL; caudal-fin length 46.4% SL.

ZUMT 62232: 669.5 mm SL, snout-vent length 284.0 mm, locality unknown.

Count characters: D 183 (82 before anus); A 0; P₁ 12; P₂ 5; C 9+5; GR 3+7.

Measurement characters: body depth 9.7% SL; head length 10.6% SL; snout length 34.4% HL; eye diameter 32.2% HL; caudal-fin length 8.4% SL.

ZUMT 63930: 118.3 mm SL, snout-vent length 75.4 mm, locality unknown.

Count characters: D 169 (73 before anus); A 0; P₁ 9; P₂ 6; C 8+6.

Measurement characters: body depth 30.0% SL; head length 25.7% SL; snout length 47.3% HL; eye diameter 36.1% HL; pectoral-fin length 7.0% SL; pelvic-fin length 56.6% SL; caudal-fin length 62.5% SL.

ZUMT ABE 10675: 164.3 mm SL, snout-vent length 112.0 mm, Urayasu (浦安), Chiba Pref., A. Akae (アカエ アリヒト), Oct. 1954.

Count characters: D 179 (81 before anus); A 0; P₁ 13; P₂ 6; C 9+5; GR 3+8.

Measurement characters: body depth 17.8% SL; head length 17.3% SL; snout length 31.6% HL; eye diameter 35.1% HL; pectoral-fin length 8.2% SL; pelvic-fin length 16.3% SL; caudal-fin length 33.2% SL.

ZUMT ABE 61-114: 2 specimens, 55.4 mm SL, snout-vent length 39.6 mm; 66.1 mm SL, snout-vent length 46.4 mm, Manazuru, Kanagawa Pref., 26 Dec. 1960, T. Abe.

Specimen 1: 55.4 mm SL

Count characters: D 169 (79 before anus); A 0; P₁ 11; P₂ 5; C 8+7; GR 3+10.

Measurement characters: body depth 20.9% SL; head length 23.9% SL; snout length 31.7% HL; eye diameter 33.2% HL; caudal-fin length 47.7% SL.

Specimen 2: 66.1 mm SL

Count characters: D 170 (79 before anus); A 0; P₁ 11; P₂ 5; C 8+5; GR 3+10.

Measurement characters: body depth 25.6% SL; head length 20.1% SL; snout length 39.2% HL; eye diameter 27.9% HL; pelvic-fin length 45.4% SL; caudal-fin length 47.5% SL.

Trachipterus sp. サケガシラ属の一種

ZUMT ABE 59-125: 1455.5 mm SL, snout-vent length 690.6 mm, locality unknown.

Remarks: The present specimen differs from three species of *Trachipterus* listed above in having higher counts of gill rakers (4+12=16 vs. 3-5+6-10=10-13 in other three species) and scale rows below lateral line at anus (45 vs. 25 in *T. ishikawae*, 31 in *T. fukuzakii*), and fewer pectoral fin rays (9 vs. 11-13 in other three species).

Count characters: D 185 (79 before anus); A 0; P₁ 9; P₂ 0; C 8+3; GR 4+12; V 89 (precaudal vertebrae 53); scales between lateral line and anus 45.

Measurement characters: body depth 13.0% SL; head length 13.4% SL; snout length 38.6% HL; eye diameter 33.7% HL; pectoral-fin length 4.4% SL; caudal-fin length 5.2% SL.

Desmodema Walters & Fitch, 1960 フリソデウオ属
Desmodema lorum Rosenblatt & Butler, 1977 オキフリソデウオ

ZUMT 1348: 159.7 mm SL, snout-vent length 107.4 mm, surface at Okinose (沖の瀬) at off Tokyo Bay (東京湾), 7 Mar. 1902, K. Aoki (青木熊吉).

Count characters: D 160 (67 before anus); A 0; P₁ 14; P₂ 9; C 8; GR 3+10.

Measurement characters: body depth 30.0% SL; head length 16.6% SL; snout length 30.6% HL; eye diameter 35.3% HL; pectoral-fin length 8.8% SL; pelvic-fin length 32.0% SL; caudal-fin length 10.1% SL.

Remarks: The present specimen represents the first record of the species from this area.

ZUMT 19470: 1167.6 mm SL, snout-vent length 309.9 mm, Hachijo-jima Island (八丈島), Y. Oshitsu (押津義雄).

Count characters: D 191 (56 before anus); A 0; P₁ 14; C 7; GR 3+9.

Measurement characters: body depth 11.8% SL; head length 8.2% SL; snout length 42.5% HL; eye diameter 28.0% HL; pectoral-fin length 1.3% SL; caudal-fin length 0.4% SL.

Remarks: The present specimen represents the first record of the species from this island.

ZUMT 33385: 83.4 mm SL, snout-vent length 59.2 mm, surface at Okinose at off Tokyo Bay, Dec. 1904, K. Aoki.

Count characters: D 168 (63 before anus); A 0; P₁ 14; P₂ 11; C 8; GR 3+10.

Measurement characters: body depth 30.5% SL; head length 20.3% SL; snout length 31.7% HL; eye diameter 26.3% HL; pectoral-fin length 12.7% SL; pelvic-fin length 72.8% SL; caudal-fin length 13.8% SL.

Remarks: The present specimen represents the first record of the species from this area.

ZUMT 49093: 125.3 mm SL, snout-vent length 92.7 mm, Fordata Island (written as Vordata Island), Tanimbar Islands, Indonesia, 31 Nov. 1955, Z. Maekawa (前川善四郎) and T. Suzuki (鈴木貞次郎).

Count characters: D 163 (64 before anus); A 0; P₁ 13; P₂ 9; C 7; GR 3+9.

Measurement characters: body depth 34.9% SL; head length 17.5% SL; snout length 34.0% HL; eye diameter 36.7% HL; pectoral-fin length 7.9% SL; caudal-fin length 9.4% SL.

ZUMT 62635: snout-vent length 337.6 mm (tip of caudal lost), locality unknown.

Count characters: D more than 134 (58 before anus); A 0; P₁ 15; GR 4+9.

Measurement characters: body depth 9.8% SL.

Desmodema polystictum (Ogilby, 1898) フリソデウオ

Remarks: Although Tanaka (1908) described *Trachypterus misakiensis* Tanaka, 1908 with a holotype collected from Misaki, Kanagawa Pref. and three paratypes, the types were not found in the present examination. *Trachypterus misakiensis* is regarded as a junior

synonym of *D. polystictum* (Martin and Hilton 2021).

ZUMT 5224: 61.6 mm SL, snout-vent length 44.8 mm, Misaki, Kanagawa Pref., 1890–1910.
Count characters: D 131 (64 before anus); A 0; P₁ 12; P₂ 9; C 8; GR 3+9.

Measurement characters: body depth 31.6% SL; head length 19.2% SL; snout length 33.8% HL; eye diameter 37.9% HL; pectoral-fin length 13.1% SL; pelvic-fin length 120.3% SL.

ZUMT 22655: 170.4+ mm SL, snout-vent length 108.9 mm, Kisyu-tanabe (紀州田邊), Wakayama Pref., Dec. 1920.

Count characters: D 123 (59 before anus); A 0; P₁ 13; P₂ 9; GR 3+10.

Measurement characters: snout length 35.5% HL; eye diameter 37.0% HL.

ZUMT 34641: 147.9 mm SL, snout-vent length 104.2 mm, Kochi, T. Kamohara (蒲原稔治) at Kochi Highschool (高知高等学校).

Count characters: D more than 134 (65 before anus); A 0; P₁ 12; P₂ 9; GR 3+10.

Measurement characters: body depth 31.0% SL; head length 16.2% SL; snout length 33.8% HL; eye diameter 39.2% HL; pectoral-fin length 4.0% SL.

ZUMT 49120: 107.0 mm SL, snout-vent length 75.6 mm, Misaki (三崎), Kanagawa Pref., 1956, I. Tomiyama.

Count characters: D more than 106 (64 before anus); A 0; P₁ 14; P₂ 9; C 8; GR 3+10.

Measurement characters: body depth 31.8% SL; head length 18.7% SL; snout length 26.6% HL; eye diameter 39.3% HL; pectoral-fin length 10.1% SL; pelvic-fin length 89.3% SL; caudal-fin length 11.4% SL.

ZUMT ABE 60-1550: 180.8 mm SL, snout-vent length 121.0 mm, locality unknown.

Count characters: D 141 (63 before anus); A 0; P₁ 11; P₂ 9; C 10; GR 3+9.

Measurement characters: body depth 28.4% SL.

***Desmodema* sp.**

ZUMT 39283: 658.9 mm SL, snout-vent length 340.0 mm, Hakodate (函館), Hokkaido (北海道), 1935–1941, T. Hikita (疋田豊治) at Hakodate Fisheries Highschool (函館高等水産学校).

Count characters: D 47 before anus; A 0; P₁ 15; P₂ 9; GR 4+10; V 74 (precaudal vertebrae 45).

Measurement characters: body depth 15.1% SL; head length 15.6% SL; snout length 54.7% HL; eye diameter 25.3% HL; pectoral-fin length 2.2% SL.

Remarks: The present specimen differs from two species of *Desmodema* listed above in having fewer dorsal-fin rays (47 before vent vs. 56–67 in two species), longer snout (54.7% HL vs. 26.6–42.5% HL), and slender and longer gill rakers on first gill arch (vs. thick and short). Toyoji Hikita was a professor at Hakodate Fisheries Highschool from 1935 to 1943.

Zu Walters & Fitch 1960 ヌキフリソデウオ属
Zu cristatus (Bonelli, 1820) ヌキフリソデウオ

ZUMT 2104: 415.5 mm SL, snout-vent length 181.2 mm, off Kishiwada (岸和田沖), Osaka Pref., 1904, donated from K. Sato (佐藤亀一) at Kagawa Prefectural Okawa Junior Highschool (香川県大川中学校).

Count characters: D 149 (51 before anus); A 0; P₁ 11; P₂ 7; C 9+2; GR 3+8.

Measurement characters: body depth 22.5% SL; head length 15.3% SL; snout length 34.4% HL; eye diameter 43.9% HL; pectoral-fin length 8.0% SL; pelvic-fin length 23.9% SL; caudal-fin length 18.7% SL.

Remarks: The present specimen described and illustrated by Tanaka (1915) as *Trachypterus ijimae* Jordan & Snyder, 1901 which is a junior synonym of *Zu cristatus*.

ZUMT 24562: 575.1 mm SL, snout-vent length 234.1 mm, Toyama Pref., specimen received at 9 Apr. 1932, Toyama Prefectural Fisheries Institute.

Count characters: D 146 (50 before anus); A 0; P₁ 11; P₂ 6; C 9+3; GR 3+9.

Measurement characters: body depth 25.4% SL; head length 14.2% SL; snout length 28.6% HL; eye diameter 40.6% HL; pectoral-fin length 6.3% SL; pelvic-fin length 23.5% SL; caudal-fin length 18.3% SL.

ZUMT 62270: 343.9 mm SL, snout-vent length 157.5 mm, Misaki, before 1913.

Count characters: D 140 (51 before anus); A 0; P₁ 11; P₂ 6; C 9+2; GR 3+8.

Measurement characters: body depth 23.6% SL; head length 16.6% SL; snout length 34.0% HL; eye diameter 35.0% HL; pectoral-fin length 5.8% SL; pelvic-fin length 55.5% SL; caudal-fin length 22.3% SL.

Regalecidae リュウグウノツカイ科
Regalecus Ascanius, 1772 リュウグウノツカイ属
Regalecus russellii (Cuvier, 1816) リュウグウノツカイ

ZUMT 52971: 1875.0+ mm SL, snout-vent length 933.0 mm, East China Sea, collected at bottom trawl fish landing area at Fukuoka Fish Market, 12 Jan. 1974, Y. Tominaga (富永義昭).

Count characters: D more than 147 (78 before anus); A 0; P₁ 14; P₂ 1; GR 12+42.

Measurement characters: eye diameter 17.4% HL.

ZUMT 62633: 895.5+ mm SL, snout-vent length 247.1 mm, locality unknown.

Count characters: D 71 before anus; A 0; P₁ 12; P₂ 1; GR 11+43.

Measurement characters: snout length 25.4% HL; eye diameter 23.3% HL.

ZUMT ABE 59-31: 367.4+ mm SL, snout-vent length 231.5 mm, locality unknown.

Count characters: D 71 before anus; A 0; P₁ 13; P₂ 1; GR 12+40.

ZUMT ABE 59-683: 323.1+ mm SL, snout-vent length 209 mm, locality unknown.
Count characters: D 67 before anus; A 0; P₁ 14; P₂ 1; GR 12+44.

ZUMT ABE 60-1151: 1437.5 mm SL, snout-vent length 378.5 mm, locality unknown.
Count characters: D 325 (83 before anus); A 0; P₁ 12; P₂ 1; C 4; GR 12+45.
Measurement characters: body depth 5.2% SL; head length 6.3% SL; snout length 26.3% HL;
eye diameter 21.2% HL.

ZUMT ABE 60-1152: 623.3+ mm SL, snout-vent length 406.5 mm, locality unknown.
Count characters: D 76 before anus; A 0; P₁ 14; P₂ 1; GR 12+44.
Measurement characters: snout length 22.7% HL; eye diameter 22.1% HL.

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References

- Abe, T. 1954. New, rare or uncommon fishes from Japanese waters. IV. Records of rare fishes of the families Lophotidae, Nomeidae and Icosteidae. *Japanese Journal of Ichthyology*, 3 (2): 90–95.
- Dornburg, A. and Near, T. J. 2021. The emerging phylogenetic perspective on the evolution on actinopterygian fishes. *The Annual Review of Ecology, Evolution, and Systematics*, 52: 427–452.
- Hayashi, K. and Senou, H. 2013. Trachipteridae. Pp. 477–479, 1865–1866. In: Nakabo, T. (ed) *Fishes of Japan with pictorial keys to the species*, 3rd edition. Tokai University Press, Hadano. (In Japanese)
- Koeda, K., Hata, H., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. History of the fish collection of the Department of Zoology, The University Museum, The University of Tokyo. *The University Museum, The University of Tokyo Material Reports*, 129: 1–24. (In Japanese)
- Martin, J. M. and Hilton, E. J. 2021. A taxonomic review of the family Trachipteridae (Acanthomorpha: Lampridiformes), with an emphasis on taxa distributed in the western Pacific Ocean. *Zootaxa*, 5039 (3): 301–351.
- Miya, M., Holcroft, N. I., Satoh, T. P., Yamaguchi, M., Nishida, M. and Wiley, E. O. 2007. Mitochondrial genome and a nuclear gene indicate a novel phylogenetic position of deep-sea tube-eye fish (Stylephoridae). *Ichthyological Research*, 54: 323–332.

- Murase, A., Ogata, Y., Yamasaki, Y., Miki, R., Wada, M. and Senou, H. 2021. Coastal, shelf, and deep-sea fishes around Kadogawa Bay, northern part of Miyazaki Prefecture, southern Japan. Nobeoka Marine Station, Field Science Center, University of Miyazaki, Nobeoka. 358 pp.
- Tanaka, S. 1908. Notes on some Japanese fishes, with descriptions of fourteen new species. *Journal of the College of Science. Imperial University, Tokyo*, 23 (7): 1–54, pls. 1–4.
- Tanaka, S. 1915. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 20: 358–360, pl. 96.

List of specimens of the families Coryphaenidae and Menidae (Actinopterygii: Teleostei) deposited in the Department of Zoology, The University Museum, The University of Tokyo

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Abstract

A list of specimens of Coryphaenidae and Menidae deposited in the Department of Zoology, The University Museum, The University of Tokyo is provided. No types are known for the families in the collection. Both valid coryphaenid species and *Mene maculata* (Bloch & Schneider, 1801), the sole extant species of Menidae, are represented.

Introduction

The dorados or dolphinfishes (family Coryphaenidae) include two species, *Coryphaena equiselis* Linnaeus, 1758 and *Coryphaena hippurus* Linnaeus, 1758, the former differing from the latter in having the dorsal fin with usually 55 or fewer fin rays (vs. usually 56 or more in *C. hippurus*), lateral-line scales 200 or fewer (vs. 200 or more), vertebrae 33 (vs. 31), greatest body depth in adults > 25% of standard length (vs. < 25%), and tongue tooth patch broad and trapezoidal (vs. small and oval). Both species are distributed in warm seas worldwide, including Japan (Gibbs and Collette 1959; Collette 1999, 2002, 2016; Senou 2013a), and are important for fisheries due to their large body, reaching to 1 m or more. This is particularly so in Hawaii, coryphaenids being called “Mahi-mahi” and traded at high prices (Collette 2002, 2016; Chiang et al. 2014; Kawama 2017a; Koeda 2018, 2019a, 2020). The family is diagnosed by a long dorsal fin originating on the nape and continuing almost to the caudal fin, the dorsal and anal fins without spines, a deeply forked caudal fin and well-developed pelvic fin, and both jaws with numerous fine teeth (Collette 1999, 2002, 2016).

The family Menidae includes a single recent species, *Mene maculata* (Bloch & Schneider, 1801) (Woodland 2001), although numerous fossil species are known (Friedman and Johnson 2005). The family is characterized by a strongly compressed and very deep body, with a sharp-edged ventral margin, small, protrusible vertical mouth, and the anal fin with a long base, and short fin rays and membrane (Woodland 2001). *Mene maculata* is widely distributed in the Indo-West Pacific from the eastern coast of Africa to Japan and Vanuatu, and marketed in

subtropical and tropical regions, including Japan (Woodland 2001; Matsunuma 2013, 2018; Chiang et al. 2014; Kawama 2017b; Hata 2018, 2020; Koeda 2019b).

Both families have been frequently included in Carangiformes in recent years (e.g., Girard et al. 2020), Coryphaenidae having been determined as a sister group of Rachycentridae in several recent studies (Betancur-R et al. 2017; Rabosky et al. 2018; Girard et al. 2020). In contrast, the phylogenetic position of Menidae is uncertain, the family having been hypothesized as a sister group of various groups, including Polynemidae (Mirande 2016), Lactariidae (Betancur-R et al. 2017), and Xiphioidea (Istiophoridae + Xiphiidae) (Rabosky et al. 2018; Girard et al. 2020). Conversely, Betancur-R et al. (2017) considered Menidae as *incertae sedis* at the ordinal level.

During an ongoing survey of the fish collection deposited in The Department of Zoology, The University Museum, The University of Tokyo (ZUMT), specimens of the above two families, collected from various areas, were found. A list of the specimens is provided herein.

Materials and Methods

Specimens of Coryphaenidae and Menidae in the Department of Zoology, The University Museum, The University of Tokyo (abbreviated as ZUMT) were identified following Gibbs and Collette (1959), Collette (1999, 2002, 2016), and Senou (2013a), and Woodland (2001) and Senou (2013b), respectively. Each specimen lot contained a single specimen. Parentheses following registration numbers include [(standard length (in mm), collection locality, collection date, and collector)]. The collection year and collector for some specimens was estimated by following Koeda et al. (2022). Remarks are given where applicable. Collection data of specimens are omitted when matching those of immediately following specimens. The ZUMT specimens listed herein were stored in Room 406 (specimen storage room) in the museum building, mostly in shelved bottles, although 32 coryphaenid specimens larger than 200 mm SL were stored in a glass tank (labelled “Coryphaenidae”; glass lid sealed with a silicon adhesive) in Room 406 (as of Mar. 2022). Although some of the ZUMT specimens collected by Dr. Tokiharu Abe (most with collection data missing) had not been registered into the ZUMT collection, they are listed herein together with their ZUMT ABE number (number with underbar written on specimen label), in the hope that Dr. Abe’s catalog books with collection data will be rediscovered in the future.

Results

The deposition of 40 ZUMT and five ZUMT ABE specimens of the two coryphaenid species, and 12 ZUMT and seven ZUMT ABE specimens of *Mene maculata* in the ZUMT fish collection were confirmed. No types are known for the families in the collection. Some coryphaenid specimens are thought to have been stored in formalin for a considerable period since their collection, and it was noted that their muscle tissues, including the caudal peduncle, had become extremely brittle. Currently, all of the specimens recorded here are stored in ethanol.

In total, 49 and 12 specimens were registered as “*Coryphaena*” or “Shiira” (シイラ, Japanese name for coryphaenid fishes) and “*Mene*” or “Ginkagami” (ギンカガミ, Japanese name for *Mene maculata*) in the ZUMT ledgers, respectively (up to ZUMT 61611), indicating a loss of registered specimens from the collection of 18.4% and 8.3%, respectively.

Specimens added to the ZUMT collection after ZUMT 61612 had remained unregistered until the present time. These included 11.1% and 5.3%, respectively, of the total specimens of each family. All have now been registered.

Species accounts

Family Coryphaenidae シイラ科
***Coryphaena equiselis* Linnaeus, 1758 エビスシイラ**

JAPAN

ZUMT 38872 (approx. 342.9 mm, caudal fin detached; probably collected from Shimane Prefecture)
ZUMT 46601 (182.6 mm), ZUMT 46602 (170.2 mm; Hachijo-jima Island, Izu Islands)
ZUMT 55545 [323.0 mm; obtained from Chinen Fisheries Cooperative Association, Nanjo City, Okinawa-jima Island, Ryukyu Islands; 15 Sept. 1986; coll. by H. Senou]

NEW GUINEA

ZUMT 63146 (136.2 mm; New Guinea; coll. by T. Abe)

INDIAN OCEAN

ZUMT 49056 [79.7 mm; approx. 300 km southeast of Seychelles (9°09'S, 58°00'E) (stomach content of *Xiphias gladius* Linnaeus, 1758); 23 Feb. 1955; coll. by Y. Tomiyama]

LOCALITY UNKNOWN

ZUMT 63055 [121.5 mm; locality unknown (same as ZUMT ABE 56-193; labelled as “St. 7”); 22 June 1931; from stomach of *Katsuwonus pelamis* (Linnaeus, 1758)
ZUMT ABE 60-1058 (290.2 mm; no data)

Remarks: Hata and Koeda (2022) reported ZUMT 46601 and 46602, collected from Hachijo-jima Island, as the first records of *C. equiselis* from the Izu Islands.

***Coryphaena hippurus* Linnaeus, 1758 シイラ**

JAPAN

ZUMT 4344 (239.7 mm), ZUMT 4345 (242.3 mm), ZUMT 6725 (262.3 mm), ZUMT 6726 (241.3 mm), ZUMT 6728 (268.8 mm; obtained at Tokyo Market, Tokyo Met.)
ZUMT 14773 (352.5 mm; Yaeyama Islands, Ryukyu Archipelago; coll. by H. Yashiro)
ZUMT 16510 (398.1 mm; Ishinomaki City, Miyagi Pref.; 10 Oct. 1925; coll. by G. Toba)
ZUMT 23890 (289.6 mm; Taniyama, Kagoshima City, Kagoshima Pref.)
ZUMT 24230 (299.3 mm; probably from Fukuoka Pref.; coll. by personnel at Fukuoka Prefectural Fisheries Experimental Station)

ZUMT 24317 (373.0 mm; Miyazu City, Kyoto Pref.; Nov. 1931; coll. by personnel at Kyoto Prefectural Fisheries Experimental Station)
ZUMT 31282 (244.7 mm; Matsue City, Shimane Pref.)
ZUMT 39269 (approx. 196.1 mm, caudal fin detached; probably collected from Iwate Prefecture; donated by R. Chiba, Hirota Village, Iwate Prefecture)
ZUMT 40537 (466.2 mm), ZUMT 40538 (492.7 mm; Hachijo-jima Island, Izu Islands)
ZUMT 41206 (242.0 mm), ZUMT 41229 (258.9 mm), ZUMT 41271 (245.4 mm), ZUMT 41272 (246.3 mm), ZUMT 41273 (253.1 mm), ZUMT 41274 (264.3 mm), ZUMT 41275 (222.6 mm), ZUMT 41276 (241.1 mm), ZUMT 41277 (260.0 mm), ZUMT 41278 (236.4 mm; Uozu or Namerikawa City, Toyama Pref.; coll. by I. Tomiyama)
ZUMT 45334 [99.9 mm; probably collected from Chiba Pref.; coll. by M. Yosezato (Naruto Junior High School)]
ZUMT 51292 (approx. 501.7 mm, body cut; East China Sea, obtained at Fukuoka Fish Market; 24 Dec. 1959; coll. by Y. Tominaga)
ZUMT 55826 (288.3 mm; Hayase, Mihama Town, Fukui Pref.; 1 Nov. 1986; coll. by M. Aizawa et al.)
ZUMT 60814 (37.0 mm; probably Sagami Bay or Suruga Bay; 18–19 July 1990; RV *Tansei-maru*)
ZUMT 63188 (525.0 mm; Ogasawara Islands; Mar. 1913)
ZUMT ABE 9059 (90.2 mm; Osaki, Shimotsu, Kainan City, Wakayama Pref.; 19 Feb. 1953; set net)

LOCALITY UNKNOWN

ZUMT 62859 (111.1 mm), ZUMT 62860 (113.9 mm), ZUMT 62891 (170.5 mm+, head only; no data), ZUMT 62892 (324.0 mm; no data), ZUMT ABE 60-1053 (66.3 mm), ZUMT ABE 61-879 (59.3 mm), ZUMT ABE 61-986 (73.1 mm)

Family Menidae ギンカガミ科

Mene maculata (Bloch & Schneider, 1801) ギンカガミ

JAPAN

ZUMT 12766 (110.7 mm; obtained at Tokyo Fish Market, Tokyo Met.)
ZUMT 22532 (75.1 mm; Tanabe City, Wakayama Pref.)
ZUMT 24127 (95.1 mm), ZUMT 24128 (96.1 mm; Arata, Kagoshima City, Kagoshima Pref.)
ZUMT 39175 (59.0 mm; Ukitsu, Muroto City, Kochi Pref.; probably collected by S. Tanaka)
ZUMT 41017 (94.1 mm; Tatsugahama, Minoshima, Arida City, Wakayama Pref., Japan; 20 Nov. 1941; coll. by M. Inoue)
ZUMT 49976 [157.5 mm; Arikawa, Shinkamigoto Town (Nakadori-jima Island, Goto Islands), Nagasaki Pref.; 10 June 1953; coll. by I. Tomiyama]
ZUMT 50694 (49.8 mm), ZUMT 50696 (27.3 mm; Totoro, Nobeoka City, Miyazaki Pref.; 10 Sept. 1959; coll. by Y. Tominaga)
ZUMT 54125 (182.1 mm; Sakihama, Muroto City, Kochi Pref.; 20 Feb. 1976)
ZUMT ABE 10105 (27.6 mm; Manazuru Town, Kanagawa Pref.; 2 Oct. 1954)

EAST CHINA SEA

ZUMT 59865 [approx. 186.2 mm (body cut); East China Sea; coll. by Y. Tominaga]

INDONESIA

ZUMT 62625 (114.0 mm; Jakarta, Java; 5 May, 1909; coll. by K. Aoki and I. Iijima)

LOCALITY UNKNOWN

ZUMT ABE 60-1332 (84.0 mm), ZUMT ABE 61-939 (37.5 mm), ZUMT ABE 61-940 (39.2 mm), ZUMT ABE 61-1055 (106.5 mm), ZUMT ABE 61-1074 (112.8 mm), ZUMT ABE 61-1075 (38.2 mm; no data)

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References

- Betancur-R., R., Wiley, E. O., Arratia, G., Acero, A., Bailly, N., Miya, M., Lecointre, G. and Ortí, G. 2017. Phylogenetic classification of bony fishes. *BMC Evolutionary Biology*, 17: 162. DOI 10.1186/s12862-017-0958-3
- Chiang, W.-C., Lin, P.-L., Chen, W.-Y., and Liu, D.-C. 2014. Marine fishes in eastern Taiwan. Fisheries Research Institute, Council of Agriculture, Keelung. vii + 331 pp. (In Chinese)
- Collette, B. B. 1999. Coryphaeniade, Dolphinfishes (dolphins). Pp. 2656–2658. In: Carpenter, K. E. and Niem, V. H. (eds) *FAO species identification guide for fishery purposes. The living marine resources of the western central Pacific. Vol. 5. Bony fishes part 2 (Mugilidae to Carangidae)*. FAO, Rome.
- Collette, B. B. 2002. Coryphaenidae, dolphinfishes (“dolphins”). Pp. 1422–1425. In: Carpenter, K. E. (ed), *FAO species identification guide for fishery purposes and American Society of Ichthyologists and Herpetologists Special Publication no. 5. The living marine resources of the western central Atlantic. Vol. 3. Bony fishes part 2 (Opisthognathidae to Molidae), sea turtles and marine mammals*. FAO, Rome.
- Collette, B. B. 2016. Coryphaenidae (dolphinfishes, “dolphins”). Pp. 2450–2453. In: Carpenter, K. E. and De Angelis, N. (eds) *FAO species identification guide for fishery purposes. The living marine resources of the eastern central Atlantic. Vol. 4. Bony fishes part 2 (Perciformes to Tetraodontiformes)*. FAO, Rome.

- Friedman, M. and Johnson, G. D. 2005. A new species of *Mene* (Perciformes: Menidae) from the Paleocene of South America, with notes on paleoenvironment and a brief review of menid fishes. *Journal of Vertebrate Paleontology*, 25 (4): 770–783.
- Gibbs, R. H., Jr. and Collette, B. B. 1959. On the identification, distribution and biology of the dolphins, *Coryphaena hippurus* and *C. equiselis*. *Bulletin of Marine Science of the Gulf of Caribbean*, 9: 117–152.
- Girard, M. G., Davis, M. P. and Smith, W. L. 2020. The phylogeny of carangiform fishes: morphological and genomic investigations of a new fish clade. *Copeia*, 108 (2): 265–298.
- Hata, H. 2018. *Mene maculata* (Bloch & Schneider, 1801). Pp. 230–231. In: Koeda, K., Hata, H., Yamada, M. and Motomura, H. (eds) Field guide to fishes landed at Uchinoura Fishing Port, Kagoshima, Japan. The Kagoshima University Museum, Kagoshima. (In Japanese)
- Hata, H. 2020. *Mene maculata* (Bloch & Schneider, 1801). Pp. 272–273. In: Koeda, K., Hata, H., Yamada, M. and Motomura, H. (eds) Fishes from markets in Osumi Peninsula, Kagoshima, Japan. The Kagoshima University Museum, Kagoshima. (In Japanese)
- Hata, H. and Koeda, K. 2022. Records of *Coryphaena equiselis* (Teleostei: Coryphaenidae) from Hachijo-jima Island, Izu Islands, Japan. *Nanki Seibutsu*, in press.
- Kawama, K. 2017a. Coryphaenidae P. 103. In: Motomura, H., Alama, U. B., Muto, N. Babaran, R. P. and Ishikawa, S. (eds) Commercial and bycatch market fishes of Panay Island, Republic of the Philippines. The Kagoshima University Museum, Kagoshima, University of the Philippines Visayas, Iloilo, and Research Institute for Humanity and Nature, Kyoto.
- Kawama, K. 2017b. *Mene maculate* [sic] (Bloch & Schneider, 1801). P. 103. In: Motomura, H., Alama, U. B., Muto, N., Babaran, R. P. and Ishikawa, S. (eds) Commercial and bycatch market fishes of Panay Island, Republic of the Philippines. The Kagoshima University Museum, Kagoshima, University of the Philippines Visayas, Iloilo, and Research Institute for Humanity and Nature, Kyoto.
- Koeda, K. 2018. *Coryphaena hippurus* Linnaeus, 1758. Pp. 228–229. In: Koeda, K., Hata, H., Yamada, M. and Motomura, H. (eds) Field guide to fishes landed at Uchinoura Fishing Port, Kagoshima, Japan. The Kagoshima University Museum, Kagoshima. (In Japanese)
- Koeda, K. 2019a. Coryphaenidae. P. 720. In: Koeda, K. and Ho, H.-C. (eds) Fishes of southern Taiwan. National Museum of Marine Biology & Aquarium, Pingtung, Taiwan.
- Koeda, K. 2019b. Menidae. P. 756. In: Koeda, K. and Ho, H.-C. (eds) Fishes of southern Taiwan. National Museum of Marine Biology & Aquarium, Pingtung, Taiwan.
- Koeda, K. 2020. *Coryphaena hippurus* Linnaeus, 1758. Pp. 270–271. In: Koeda, K., Hata, H., Yamada, M. and Motomura, H. (eds) Fishes from markets in Osumi Peninsula, Kagoshima, Japan. The Kagoshima University Museum, Kagoshima. (In Japanese)
- Koeda, K., Hata, H., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. History of the fish collection of the Department of Zoology, The University Museum, The University of Tokyo. *The University Museum, The University of Tokyo Material Reports*, 129: 1–24. (In Japanese)
- Matsunuma, M. 2013. *Mene maculata* (Bloch & Schneider, 1801). P. 123. In: Yoshida, T., Motomura, H., Musikashinthorn, P., Matsuura, K. (eds) Fishes of northern Gulf of Thailand. National Museum of Nature and Science, Tsukuba, Research Institute for Humanity and Kagoshima University Museum, Kagoshima.

- Matsunuma, M. 2018. *Mene maculata* (Bloch & Schneider, 1801). P. 142. In: Kimura, S., Imamura, H., Quan, N. V., Duong, P. T. (eds) Fishes of Ha Long Bay, the World Natural Heritage Site in Northern Vietnam. Fisheries Research Laboratory, Mie University, Shima.
- Mirande, J. M. 2016. Combined phylogeny of ray-finned fishes (Actinopterygii) and the use of morphological characters in large-scale analyses. *Cladistics*, 33: 333–350.
- Rabosky, D. L., Chang, J., Title, P. O., Cowman, P. F., Sallan, L., Friedman, M., Kaschner, K., Garilao, C., Near, T. J., Coll, M. and Alfaro, M. E. 2018. An inverse latitudinal gradient in speciation rate for marine fishes. *Nature*, 559: 392–395.
- Senou, H. 2013a. Coryphaenidae, dolphins. Pp. 874, 1990. In: Nakabo, T. (ed) Fishes of Japan with pictorial keys to the species third edition. Tokai University, Press, Hadano. (In Japanese)
- Senou, H. 2013b. Menidae, moonfishes. Pp. 877, 1990. In: Nakabo, T. (ed) Fishes of Japan with pictorial keys to the species third edition. Tokai University, Press, Hadano. (In Japanese)
- Woodland, D. J. 2001. Menidae, moonfish. P. 2791. In: Carpenter, K. E. and Niem, V. H. (eds), FAO species identification guide for fishery purposes. The living marine resources of the western central Pacific, volume 5: Bony fishes part 3 (Menidae to Pomacentridae). FAO, Rome.

Report on the specimens of family Ephippidae (Teleostei: Perciformes) deposited in the Department of Zoology, The University Museum, The University of Tokyo

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Abstract

The collection of Ephippidae (Teleostei: Perciformes) deposited in the Department of Zoology, the University Museum, the University of Tokyo (ZUMT) were re-identified in the present study. In total 45 specimens in 45 lots of two genera of four species were found from the collection. A single specimen of *Platax orbicularis* (Forsskål, 1775)(ZUMT 62320) which collected from Natuna Islands (Indonesia), was discovered from the uncataloged specimen group which donated by Sarawak Museum to I. Tomiyama. The collection date of the specimen written as 25 November 1890 on the paper tag which found from the gill chamber of the specimen, and is probably representing the oldest specimen in the ZUMT collection.

Introduction

The fish collection of families Ephippidae (Teleostei: Perciformes) which preserved in the Department of Zoology, the University Museum, the University of Tokyo (ZUMT) were re-identified in the present study. The family Ephippidae found in a variety of shallow-water habitats, estuaries, harbors, and coral reefs (Heemstra 2001). Although eight genera are known for the family (Fricke et al. 2022), two genera, *Ephippus* Cuvier, 1816 and *Platax* Cuvier, 1816, have been recorded from Japanese waters (Hayashi and Hagiwara 2013). During the management of ZUMT, 45 specimens of 45 lots of Ephippidae were discovered from the collection. The specimens were re-identified by the first author, and listed below.

Materials and Methods

The specimens of Ephippidae in ZUMT were re-identified in the present study, generally following Heemstra (2001) and Hayashi and Hagiwara (2013), and confirmation of at least one diagnostic character. The standard length (SL) of the specimens were measured for all specimens. Species are arranged in alphabetical order. Local name, and collector's name and affiliation are given where known (from the specimen catalog or tag), with Japanese language equivalents in parentheses. The following list includes ZUMT number, SL, with number of specimens in parentheses when two or more, type (abbreviated when non-type), collection locality, collection date, collector or donator and affiliation, collection method, and remarks when available. The collection year and collector for some specimens was estimated by

following Koeda et al. (2022). Although, some of the ZUMT specimens collected by Dr. Abe had not been formally cataloged into the ZUMT collection (and the data of some specimens not retained), such specimens which can recognize by having underbar with the number on the accompanying label, are listed herein with the number ZUMT ABE XXXX, due to the possibility of future discovery of Dr. Abe's remaining catalog books with collection data. Catalog numbers after ZUMT 62000 are newly given during this study.

Collection of Ehippidae in ZUMT

During this research, 45 specimens in 45 lots of two genera of four species of Ehippidae were found from the ZUMT collection. A single specimen of *Platax orbicularis* (Forsskål, 1775)(ZUMT 62320) which collected from Natuna Islands (Indonesia) on 25 November 1890, was discovered from the uncataloged specimen group which donated by Tom Harrisson (Sarawak Museum) to Ichiro Tomiyama. This specimen probably representing the oldest specimen in the ZUMT collection.

Ehippidae マンジュウダイ科
Ehippus Cuvier, 1816 マンジュウダイ属
Ehippus orbis (Bloch, 1787) マンジュウダイ

- ZUMT 13699**: 91.4 mm SL, off Tansui (淡水), Taipei (台北), Taiwan, T. Aoki (青木赳雄) at Fisheries Division of Governor-General's Office, Taiwan (台湾総督府殖産局水産課).
ZUMT 39591: 79.3 mm SL, Philippines, probably 1926, U. Yamamura.
ZUMT 57503: 138.6 mm SL, locality unknown.

Platax Cuvier, 1816 ツバメウオ属
Platax orbicularis (Forsskål, 1775) ナンヨウツバメウオ

- ZUMT 19702**: 34.6 mm SL, Keelung (基隆), Taiwan, H. Sato (佐藤春吉) at Taipei Keelung Junior High School (台北基隆中学校).
ZUMT 20253: 77.2 mm SL, Wakayama Pref.
ZUMT 35989: 67.3 mm SL, Fukura (福良), Awaji-shima Island (淡路島), Hyogo Pref., 5 Mar. 1912, R. Uchimura (内村柳太郎).
ZUMT 37649: 95.5 mm SL; **ZUMT 37650**: 124.2 mm SL; **ZUMT 37651**: 104.6 mm SL, **ZUMT 37653**: 27.6 mm SL, Palau, 19 Oct. 1936, probably T. Abe (阿部宗明).
ZUMT 43298: 47.2 mm SL; **ZUMT 43299**: 46.0 mm SL, locality unknown.
ZUMT 42326: 181.5 mm SL, Basilan, Philippines, 1926, U. Yamamura (山村樸次郎).
ZUMT 52175: 46.6 mm SL, Totoro (土々呂), Nobeoka (延岡), Miyazaki Pref., Aug. 1960.
ZUMT 53413: 61.2 mm SL, Ishigaki-jima Island.
ZUMT 54607: 38.3 mm SL; **ZUMT 54608**: 56.1 mm SL, Fish market, Puerto Princesa, Palawan Island, Philippines, 8 Feb. 1985, M. Aizawa (藍澤正宏).
ZUMT 55308: 62.4 mm SL, Palau, Aug. 1935, Y. Haneda (羽根田彌太).

ZUMT 62320: 104.2 mm SL, Natuna Islands (Indonesia), 25 Nov. 1890, donated by Sarawak Museum to I. Tomiyama.

ZUMT ABE 2836: 84.5 mm SL; **ZUMT ABE 3693:** 20.8 mm SL; **ZUMT ABE 3902:** 19.2 mm SL; **ZUMT ABE 6057:** 30.1 mm SL, Palau, 1930's, T. Abe.

Platax pinnatus (Linnaeus, 1758) アカククリ

ZUMT 11103: 108.0 mm SL, Philippines, U. Yamamura.

ZUMT 25567: 192.3 mm SL, Philippines, identified on 12 May 1933, A. W. Herre at Stanford University.

ZUMT ABE 2614: 209.3 mm SL; **ZUMT ABE 2867:** 92.5 mm SL, Palau, 1930's, T. Abe.

Platax teira (Forsskal, 1775) ツバメウオ

ZUMT 12678: 162.7 mm SL, locality unknown.

ZUMT 19397 (anterior half of body) and **ZUMT 19398** (posterior half of body): 273.1 mm SL; **ZUMT 19399:** 226.2 mm SL, Hachijo-jima Island (八丈島), late 1920's to early 1930's, Y. Oshitsu (押津義雄).

ZUMT 20216: 115.5 mm SL, Wakayama Pref., Jan. 1930, N. Ui (宇井縫蔵).

ZUMT 23969: 119.9 mm SL, Shibushi (志布志), Kagoshima Pref.

ZUMT 31001: 142.6 mm SL; **ZUMT 38893:** 235.2 mm SL, Hachijo-jima Island.

Remarks: This species called as "Uchiwauwo (ウチワウヲ)" in local name.

ZUMT 37579: 87.8 mm SL, Misaki (三崎), Miura (三浦), Kanagawa Pref., 1930's, K. Miyoshi (三好 要).

ZUMT 37652: 162.0 mm SL, Palau, 19 Oct. 1936.

ZUMT 42363: 75.8 mm SL, Basilan, Philippines, 1926, U. Yamamura.

ZUMT 47669: 101.9 mm SL, unknown.

ZUMT 48906: 162.2 mm SL, near Joga-shima Island (城ヶ島), Kanagawa Pref., 6 Apr. 1957, I. Tomiyama.

ZUMT 49983: 117.2 mm SL, Arikawa (有川), Nakadori-jima Island (中通島), Goto Islands (五島列島), 10 June 1953, I. Tomiyama.

ZUMT 50033: 172.1 mm SL, Mitsuiraku (三井楽), Fukue-jima Island (福江島), Goto Islands, 13 Oct. 1953, I. Tomiyama.

ZUMT 50210: 130.7 mm SL, Arikawa, Nakadori-jima Island, Goto Islands, 19 Oct. 1953, I. Tomiyama.

ZUMT 62335: 244.2 mm SL, **ZUMT 62336:** 147.9 mm SL, locality unknown.

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References

- Fricke, R., Eschmeyer, W.N., Van der Laan, R. (eds). 2022. Eschmeyer's catalog of fishes: genera, species, references. Electronic version.
<https://researcharchive.calacademy.org/research/ichthyology/catalog/getref.asp?id=20773>.
Accessed 10 Apr. 2022
- Heemstra, P. C. 2001. Ephippidae, Spadefishes (batfishes). Pp. 3611–3622. In: Carpenter, K. E. and Niem, V. H. (eds) FAO species identification guide for fishery purposes. The living marine resources of the western central Pacific, vol. 6. Bony fishes part 4 (Labridae to Latimeriidae). FAO, Rome.
- Hayashi, K. and Hagiwara, K. 2013. Ephippidae. Pp. 1609–1611, 2212. In: Nakabo, T. (ed) Fishes of Japan with pictorial keys to the species, third edition. Tokai University Press, Hadano. (In Japanese)
- Koeda, K., Hata, H., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. History of the fish collection of the Department of Zoology, The University Museum, The University of Tokyo. The University Museum, The University of Tokyo Material Reports, 129: 1–24. (In Japanese)

Report on the specimens of Setarchidae (Teleostei: Scorpaenoidei) deposited in the Department of Zoology, The University Museum, The University of Tokyo

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Abstract

The collection of Setarchidae (Teleostei: Scorpaenoidei) held in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT) includes 30 specimens representing three genera and five species, most of which were collected from 1924 to 1936, but does not include type specimens of nominal species in the family. About two-third of the specimens were donated from the Mitsui Institute of Marine Biology (previously at Shimoda City, Shizuoka Prefecture, Japan). The distributions of the five species in Japanese waters in the early 20th century, as judged from these specimens, were not significantly different from the current distributions. A single specimen of *Lythrichthys longimanus* (Alcock, 1894) from the Enshu-nada Sea, Shizuoka Prefecture represents the first record of this species from the Enshu-nada Sea.

Introduction

The circumglobal deepwater scorpionfish family Setarchidae Matsubara, 1943 (Teleostei: Scorpaenoidei) is one of the most widely distributed scorpionfish family including four valid genera and twelve valid species (Wada et al. 2020, 2021; Romanov et al. 2021; Wada and Motomura 2022), ranging from tropical to temperate waters of the Indo-Pacific and Atlantic deep-seas about 150–2400 m depth (Eschmeyer and Collette 1966; Poss 1999; Nakabo and Kai 2013). This family is characterized by the following characters: cranium thin, cavernous, bones weakly ossified; suborbital stay uniformly broad or gradually becoming wider posteriorly, without spines; no fleshy appendages on head or body; small slit present behind fourth gill arch; lateral line continuous, covered by thin membranous scales; cycloid scales on head and body; total vertebrae 24; and pyloric caecum 4 or 5 (Eschmeyer and Collette 1966; Ishida 1994; Motomura and Struthers 2015; Wada et al. 2021).

During the management of the fish collection in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT), 30 specimens were identified by the first author as belonging to the family Setarchidae. They are listed below with distributional notes.

Materials and Methods

Identifications of the setarchid specimens in ZUMT were confirmed by the first author, with reference to Wada et al. (2020, 2021), Romanov et al. (2021), and Wada and Motomura (2022). Standard lengths (SL) were measured for all specimens, which are arranged herein in alphabetical order by species. 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, type (abbreviated when non-type), collection locality, collection depth, collection date, collecting method, collector or donator and affiliation, and remarks when applicable. Catalog numbers after ZUMT 62000 are newly given during this study.

Collection of Setarchidae in ZUMT

Three genera and five species of the family Setarchidae are represented by 30 specimens held in ZUMT, there being no type specimens of any nominal species. Most of specimens were collected from 1924 to 1936, many representing Kanagawa to Kochi prefectures in the Pacific coast of Japan. No local names were used for any of these specimens. Probably these species were new face in these collection localities of the specimens at that time because deepwater bottom trawl, most common method to catch these species, was newly developed and not a traditionally in Japan at that time (Faculty of Fisheries, Nagasaki University 1973; Kataoka 1999). Currently, the five species are still having no determinate local names (Ichthyological Society of Japan 1981; Fujiwara 2015). The 19 of 30 specimens were donated from Mitsui Institute of Marine Biology (MIMB; previously at Shimoda City, Shizuoka Prefecture, Japan), and most of them collected from Suruga Bay, Shizuoka Prefecture, Japan. These specimens were donated to ZUMT around 1941 when MIMB closes. The distribution of these species in Japan in the early 20th century, as judged from these specimens, was not significantly different from the current distributions (Nakabo and Kai 2013; Wada et al. 2020, 2021). The current common species *Lythrichthys cypho* (Fowler, 1938), *L. eulabes* Jordan & Starks, 1914, and *Setarches guentheri* Johnson, 1862 were also commonly collected in the early 20th century (Wada et al. 2020, 2021; this study). *Ectreposebastes imus* Garman, 1899 and *L. longimanus*, which are still rare, were also rarely collected at that time (Amaoka 1984; Wada et al. 2021; this study).

Setarchidae シロカサゴ科

Ectreposebastes Garman, 1899 クロカサゴ属

Ectreposebastes imus Garman, 1899 クロカサゴ

ZUMT 62446: 65.1 mm SL; **ZUMT 62447:** 62.3 mm SL, probably off Shizuoka Pref., Japan 21 Oct. 1940, R/V Dainichi-maru (大日丸), donated from MIMB. The label reads as follows: DAINITI-MARU: 2599~2600; 21/10 /2600.

Remarks: The date on the label of this specimen is written in the accession of Emperor Jinmu (the same for ZUMT 62448).

ZUMT 63454: 118.2 mm SL, northeast of Suriname (07°49'N, 54°14'W), 676 m depth, 1 Dec. 1980, otter trawl, M. Aizawa, collected at the survey to develop new fishery resources by the Japan Marine Fishery Resource Research Center (JAMARC) during 1 June 1979 to 31 March 1983 (Uyeno et al. 1983).

Lythrichthys Jordan & Starks, 1904 アカカサゴ属

Lythrichthys cypho (Fowler, 1938) アズキカサゴ

ZUMT 62430: 47.7 mm SL; **ZUMT 62431:** 43.6 mm SL; **ZUMT 62432:** 37.8 mm SL; **ZUMT 62433:** 40.2 mm SL; **ZUMT 62434:** 29.8 mm SL, Suruga Bay, off Heda, Numazu City, Shizuoka Pref., Japan, Dec. 1936, donated from MIMB.

ZUMT 62448: 36.3 mm SL, Sagami Bay (details unknown), ca. 400 m depth, 20 Mar 1941, 4 m beam trawl (1270 m length), donated from MIMB. The label reads as follows: SAGAMI SEA: Aguro Bay. D= ca. 400 m: 4m. B. Trawl 1270 m: 20/3.2601.

Lythrichthys eulabes Jordan & Starks, 1904 アカカサゴ

ZUMT 15517: 78.6 mm SL, coast of Kanagawa Pref., Japan, 1924, S. Miyashiro (East Kanagawa Technical Senior High School) [宮代周輔 (東神奈川工業学校)].

ZUMT 18977: 94.4 mm SL, Tosa Bay, off Kochi City, Kochi Pref., Japan, 7 Feb. 1929, T. Kamohara (Kochi Senior High School) [蒲原稔治 (高知高等学校)].

ZUMT 22592: 112.9 mm SL; **ZUMT 22593:** 106.3 mm SL, Tosa Bay, Kannoura (currently Toyo Town), Kochi Pref., Japan, 3 Apr. 1929, T. Kamohara.

ZUMT 24248: 102.9 mm SL; **ZUMT 24260:** 106.3 mm SL, Tosa Bay, off Mimase, Kochi, Kochi Pref., Japan, 15 Jan. 1932, T. Kamohara.

ZUMT 26398: 120.0 mm SL, Sagami Bay, off Iwa, Manazuru, Ashigarashimo, Kanagawa Pref., Japan, 1925, set net (大謀網), T. Fujita (a student at Fishery School) [藤田 正 (水産講習所生徒)].

ZUMT 33519: 32.7 mm SL, Suruga Bay, off Shizuura (currently Shishihama, Numazu City), Shizuoka Pref., Japan, May 1935, N. Kuroda (黒田長礼; details explained in Koeda et al. 2022).

Lythrichthys longimanus (Alcock, 1894) スミクイアカカサゴ

ZUMT 33974: 125.7 mm SL, Enshu-nada Sea, off Hamamatsu, Shizuoka Pref., Japan, N. Ishiuchi (Hamamatsu Normal School) [石内直太郎 (浜松師範学校)].

Remarks: *Lythrichthys longimanus* is widely distributed in eastern Indian to western Pacific oceans (Wada et al. 2021). In Japanese waters, this species has been widely recorded from Kanagawa to Kochi prefectures in the Pacific coast, and Kagoshima to Okinawa

prefectures in the East China Sea coast on the basis of reliably identified specimens, but the distributional gap remained at the Enshu-nada Sea in the Pacific coast of Japan (Wada et al. 2021). Thus, the present specimen represents the first record of the species from this area.

Setarches Johnson, 1862 シロカサゴ属
Setarches guentheri Johnson, 1862 シロカサゴ

- ZUMT 24308:** 85.3 mm SL, Tosa Bay, off Mimase, Kochi, Kochi Pref., Japan, 5 Dec. 1931, T. Kamohara.
- ZUMT 62435:** 88.0 mm SL; **ZUMT 62436:** 78.2 mm SL; **ZUMT 62437:** 49.3 mm SL; **ZUMT 62438:** 52.2 mm SL; **ZUMT 62439:** 51.0 mm SL; **ZUMT 62440:** 47.1 mm SL; **ZUMT 62441:** 50.1 mm SL; **ZUMT 62442:** 50.4 mm SL; **ZUMT 62443:** 53.1 mm SL; **ZUMT 62444:** 45.0 mm SL, Suruga Bay, off Heda, Numazu City, Shizuoka Pref., Japan, Dec. 1936, donated from MIMB.
- ZUMT 62445:** 175.6 mm SL, Suruga Bay, off Heda, Numazu City, Shizuoka Pref., Japan, donated from MIMB.

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References

- Amaoka, K. 1984. *Ectreposebastes imus*. P. 317, pl. 283. In: Masuda, H., Amaoka, K., Araga, C., Uyeno, T. and Yoshino, T. (eds) The fishes of the Japanese archipelago. Tokai University Press, Tokyo.
- Eschmeyer, W. N. and Collette, B. B. 1966. The scorpionfish subfamily Setarchinae, including the genus *Ectreposebastes*. Bulletin of Marine Science, 16: 349–375.
- Faculty of Fisheries, Nagasaki University. 1973. Fishes of southern & western Japan, edited by T. A. Glover during 1912 to 1933. Vol. 1 (group 1~7). Faculty of Fisheries, Nagasaki University, Nagasaki. 429 pp., 176 pls.
- Fujiwara, M. 2015. Minor marine products super minor marine products picture book [Oishii maina gyokai zukan]. Mynavi Corporation, Tokyo. 319 pp. (In Japanese)

- Ichthyological Society of Japan. 1981. Dictionary of the Japanese fish names and their foreign equivalents. Sanseido, Tokyo. vii + 843 pp. (In Japanese)
- Ishida, M. 1994. Phylogeny of the suborder Scorpaenoidei (Pisces: Scorpaeniformes). Bulletin of the Nansei National Fisheries Research Institute, 27: 1–112.
- Kataoka, C. 1999. Modern history of fresh fish distribution and fish market in Nagasaki. Bulletin of the Faculty of Fisheries, Nagasaki University, 80: 1–33.
- Koeda, K., Hata, H., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. History of the fish collection of the Department of Zoology, The University Museum, The University of Tokyo. The University Museum, The University of Tokyo Material Reports, 129: 1–24. (In Japanese)
- Motomura, H. and Struthers, C. D. 2015. Setarchidae. Pp. 1083–1085. In: Roberts, C. D. and Stewart, A. L. and Struthers, C. D. (eds) The Fishes of New Zealand. Vol. 3. Te Papa Press, Wellington.
- Nakabo, T. and Kai, Y. 2013. Scorpaenidae, scorpionfishes. Pp. 683–705, 1939–1946. In: Nakabo, T. (ed) Fishes of Japan with pictorial keys to the species, third edition. Tokai University Press, Hadano. (In Japanese)
- Poss, S. G. 1999. Scorpaenidae. Pp. 2291–2352. In: Carpenter, K. E. and 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). FAO, Rome.
- Romanov, E. V., ChereI, Y. and Marsac, F. 2021. New record of *Ectreposebastes niger* (Fourmanoir, 1971) (Setarchidae, Scorpaeniformes): a rare bathypelagic fish from La Pérouse Seamount, Western Indian Ocean, and distribution of *Ectreposebastes* Garman, 1899 in the Indian Ocean. Zoosystema, 43: 283–296.
- Uyeno, T., Matsuura, K. and Fujii, E. 1983. Fishes trawled off Suriname and French Guiana. Japan Marine Fishery Resource Research Center, Tokyo. 519 pp.
- Wada, H., Kai, Y. and Motomura, H. 2020. Redescription of the circumglobal deepwater scorpionfish *Setarches guentheri* (Setarchidae). Ichthyological Research. DOI: 10.1007/s10228-020-00762-6
- Wada, H., Kai, Y. and Motomura, H. 2021. Revision of the resurrected deepwater scorpionfish genus *Lythrichthys* Jordan and Starks 1904 (Setarchidae), with descriptions of two new species. Ichthyological Research. DOI: 10.1007/s10228-020-00793-z
- Wada, H. and Motomura, H. 2022. Two new species of the deepwater scorpionfish genus *Lioscorpius* (Setarchidae) from the southwestern Pacific Ocean. Ichthyological Research. DOI: 10.1007/s10228-022-00860-7



Fig. 1. Preserved specimen of *Lythrichthys longimanus* from Enshu-nada Sea, Shizuoka Pref., Japan (ZUMT 33974, 125.7 mm SL)

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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References

- Blanc, M. and Hureau, J.-C. 1973. Peristediidae. P. 591. In: Hureau, J.-C. and T. Monod (eds.) Check-list of the fishes of the North-eastern Atlantic and of the Mediterranean. Vol. 1. UNESCO, Paris.
- Bussing, W. A. 2010. A new fish, *Peristedion nesium* (Scorpaeniformes: Peristediidae) from Isla del Coco, Costa Rica. *Revista de Biología Tropical*, 58: 1149–1156.
- Fricke, R., Kawai, T., Yato, T. and Motomura, H. 2017. *Peristedion longicornutum*, a new species of armored gurnard from the western Pacific Ocean (Teleostei: Peristediidae). *Journal of the Ocean Science Foundation*, 28: 90–102.
- Higuchi, J. and Kawai, T. 2020. First record of *Satyrichthys moluccensis* (Bleeker, 1850) (Actinopterygii: Teleostei: Peristediidae) from Samoa, the central Pacific. *The Thailand Natural History Museum Journal*, 14: 147–152.
- Ho, H.-C., Chee, W.-L., Chang, C.-H. and Shao, K.-T. 2013. Taxonomic review and DNA barcoding of the fish genus *Peristedion* (Scorpaeniformes: Peristediidae) in Taiwan. *Platax*, 10: 37–55.
- Ikeda, H. and Nakabo, T. 2015. Fishes of the Pacific coasts of southern Japan. Tokai University Press, Hadano. 596 pp. (In Japanese)
- Kamata, Y. 1979. Topography and Geology of Ariake Sound (Ariakekai no chikei chishitsu). *Bulletin on Coastal Oceanography*, 17: 72–85. (In Japanese)
- Kamohara, T. 1952. Studies on the family Peristediidae found in Japan. *Japanese Journal of Ichthyology*, 2: 1–13. (In Japanese with English summary)
- Kawai, T. 2008. Phylogenetic systematics of the family Peristediidae (Teleostei: Actinopterygii). *Species Diversity*, 13: 1–34.
- Kawai, T. 2011. *Peristedium indicum* Brauer 1906, a junior synonym of *Paraheminodus murrayi* (Günther 1880) (Teleostei: Peristediidae). *Ichthyological Research*, 58: 67–71.
- Kawai, T. 2013. Revision of the peristediid genus *Satyrichthys* (Actinopterygii: Teleostei) with the description of a new species, *S. milleri* sp. nov. *Zootaxa* 3635: 419–438.
- Kawai, T. 2014. *Satyrichthys kikingeri* Pogoreutz, Vitecek & Ahnelt, 2013, a junior synonym of *Satyrichthys laticeps* (Schlegel, 1852) (Actinopterygii: Teleostei: Peristediidae). *Zootaxa* 3900: 135–140.
- Kawai, T. 2016. *Peristedion richardsi* sp. nov. (Actinopterygii: Teleostei: Peristediidae) from Indonesian waters, with synonymy between *Peristedion riversandersoni* Alcock, 1894 and *Peristedion nierstraszi* Weber, 1913. *Zootaxa* 4171: 335–346.
- Kawai, T. 2019. Revision of an armored searobin genus *Scalicus* Jordan 1923 (Actinopterygii: Teleostei: Peristediidae) with a single new species. *Ichthyological Research*. DOI: 10.1007/s10228-019-00691-z
- Kawai, T., Imamura, H. and Nakaya, K. 2003. Records of armored sea robins from the Pacific coast of northern Japan (Teleostei: Peristediidae). *Bulletin of Fisheries Sciences, Hokkaido University*, 54: 13–16.
- Kawai, T., Imamura, H. and Nakaya, K. 2004a. *Paraheminodus kochiensis* Kamohara, 1957 (Teleostei: Peristediidae), a junior synonym of *Paraheminodus murrayi* (Günther, 1880), with a comparison of *Paraheminodus murrayi* and *Paraheminodus laticephalus* (Kamohara, 1952). *Ichthyological Research*, 51: 73–76.

- Kawai, T., Imamura, H. and Nakaya, K. 2004b. A new species of armored sea robin, *Paraheminodus kamoharai* (Teleostei: Peristediidae), from the Philippines. *Ichthyological Research*, 51: 126–130.
- Kawai, T., Nakaya, K. and Séret, B. 2008. A new armored searobin *Paraheminodus longirostralis* (Teleostei: Peristediidae) from New Caledonia. *Ichthyological Research*, 55: 374–378.
- Kikuchi, T. 1970. Fauna and flora of the sea around the Amakusa Marine Biological Laboratory. Part VIII. Fishes. Amakusa Marine Biological Laboratory, Faculty of Science Kyushu University, Amakusa. 52 pp. (In Japanese)
- Koeda, K., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. Report on specimens of the family Pempheridae (Teleostei: Perciformes) deposited in the Department of Zoology, The University Museum, The University of Tokyo. *The University Museum, The University of Tokyo Material Reports*, 128: 1–16.
- Koeda, K., Hata, H., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. History of the fish collection of the Department of Zoology, The University Museum, The University of Tokyo. *The University Museum, The University of Tokyo Material Reports*, 129: 1–24. (In Japanese)
- Koyanagi, S. 1931. Marine creatures of the Ariake Sound (Ariakekai san doubutu chousa). Kose-mura Village, Saga. 234 pp. (In Japanese)
- Miller, G. C. 1967. A new species of western Atlantic armored searobin, *Peristedion greyae* (Pisces: Peristediidae). *Bulletin of Marine Science*, 17: 16–41.
- Miller, R. G. and Richards, W. J. 1990. Peristediidae. P. 685. In: Quéro, J.-C., J.-C. Hureau, C. Karrer, A. Post and L. Saldanha (eds) Check-list of the fishes of the eastern tropical Atlantic. CLOFETA. UNESCO, Paris.
- Miller, R. G. and Richards, W. J. 2003. Peristediidae. Pp. 1278–1285. In: Carpenter, K. E. (ed.) *The living marine resources of the Western Central Atlantic. Volume 2: Bony fishes part 1 (Acipenseridae to Grammatidae)*. FAO species identification guide for fishery purposes and American Society of Ichthyologist and Herpetologists Special Publication No. 5. FAO, Rome.
- Morotomi Town History Compilation Committee. 1984. *History of Morotomi Town (Morotomi-cho Shi)*. Morotomi Town, Saga. 1379 pp. (In Japanese)
- Motomura, H. 2020. List of Japan's all fish species. Current standard Japanese and scientific names of all fish species recorded from Japanese waters. The Kagoshima University Museum, Kagoshima. 560 pp. (In Japanese)
- Nelson, J. S. 2006. *Fishes of the world*. Fourth Edition. John Wiley & Sons, New York. xix + 601 pp.
- Ono, M. and Kawai, T. 2014. Review of armored searobins of the genus *Peristedion* (Teleostei: Peristediidae) in Japanese waters. *Species Diversity*, 19: 117–131.
- Richards, W. J. 1999. Family Triglidae. Pp. 2359–2382. In: Carpenter, K. E. and V. H. Niem (eds.) *FAO Species Identification Guide for Fishery Purposes. The Living Marine Resources of the Western Central Pacific. Volume 4: Bony Fishes Part 2 (Mugilidae to Carangidae)*. FAO, Rome.

- Richards, W.J. and Miller, G.C. 2016. Peristediidae. Armored searobins. Pp. 2296–2297. In: Carpenter, K. E. and De Angelis, N. (eds) The living marine resources of the Eastern Central Atlantic. Volume 3: Bony fishes part 1 (Elopiformes to Scorpaeniformes). FAO, Rome.
- Tenda, M. and Kawai, T. 2012. Record of the armored searobin *Peristedion barbiger* (Garman, 1899) (Actinopterygii: Teleostei: Peristediidae) off Peru with taxonomic notes. *Species Diversity*, 17: 135–144.
- Uchida, K. and Tsukahara, H. 1955. The fish-fauna of Ariake Sound. *Bulletin of the Biogeographical Society of Japan*, 16–19: 292–302. (In Japanese)
- Yamada, U., Tokimura, M., Horikawa, H. and Nakabo, T. 2007. Fishes and Fisheries of the East China Sea and Yellow Sea. Tokai University Press, Hadano. (In Japanese)
- Yamada, U. and Yagishita, N. 2013. Peristediidae. armored searobins. Pp. 727–731, 1951–1952. In: Nakabo, T. (ed) Fishes of Japan with pictorial keys to the species, third edition. Tokai University Press, Hadano. (In Japanese)
- Wada, H., Kai, Y. and Motomura, H. 2020. Northernmost record of *Peristedion riversandersoni* (Teleostei: Peristediidae) from off Iwate Prefecture, Japan, with newly recognized diagnostic characters for the species. *Taxa*, proceedings of the Japanese Society of Systematic Zoology, 48: 1–8. (In Japanese)
- Wada, H., Koeda, K., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. Report on the specimens of Setarchidae (Teleostei: Scorpaenoidei) deposited in the Department of Zoology, the University Museum, the University of Tokyo. *The University Museum, The University of Tokyo Material Reports*, 29: 49–54.
- Washio, M., Ariyoshi, T. and Noguchi, T. 1996. Fish-fauna in the innermost waters of Ariake Sound, western Kyushu, Japan. *Bulletin of Saga Prefectural Ariake Fisheries Research and Development Center*, 17: 7–10. (In Japanese)



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

Report on specimens of Trachinidae and Uranoscopidae (Teleostei: Perciformes: Trachinoidei) deposited in the Department of Zoology, The University Museum, The University of Tokyo

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Abstract

The Trachinidae and Uranoscopidae (Teleostei: Perciformes: Trachinoidei) collection held in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT) comprised 81 specimens, representing four genera and eight species, most of which were collected in the late 20th century, and included three paratypes of *Uranoscopus flavipinnis* Kishimoto, 1987.

Introduction

The weeverfish family Trachinidae Rafinesque, 1815 (Teleostei: Perciformes: Trachinoidei) is currently represented by two valid genera and nine valid species, occurring primarily in the East Atlantic, including the Mediterranean and Black seas (except *Trachinus cornutus* Guichenot, 1848 in the southeastern Pacific), and inhabiting sandy or muddy bottoms from shallow beaches to continental shelves in various depths shallower than 200 m (Pequeño 1989; Roux 1990; Smith 2016a; Fricke et al. 2022). The stargazer family Uranoscopidae Jordan & Evermann, 1898 (Trachinoidei) is currently represented by seven valid genera and about 60 valid species, inhabiting sandy or muddy bottoms on continental shelves and upper slopes in depths less than 400 m in the Atlantic, Indian, and Pacific oceans (Kishimoto 2001; Yamada and Yagishita 2013; Smith 2016b; Fricke et al. 2022). The families are similar in sharing eyes on the dorsal surface of the head, a large vertically oblique mouth, and bottom-dwelling behavior (Kishimoto 2001; Smith 2016a, b), and are considered to be phylogenetically close (Pietsch 1989; Imamura and Odani 2013). However, Trachinidae differs from Uranoscopidae in having a small, rounded head (vs. large, dorsally flattened in the latter), a strong venomous spine on the outer surface of the opercle (vs. present on uppermost part of cleithrum or absent), and the dorsal fin origin level with or anterior to the pectoral fin origin (vs. behind pectoral fin origin) (Kishimoto 2001; Smith 2016a, b).

During management of the fish collection in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT), 81 specimens were identified by the first author

as belonging to the families Trachinidae or Uranoscopidae. They are listed below with distributional notes.

Materials and Methods

Identifications of the trachinoid specimens in ZUMT were confirmed by reference to Kishimoto (2001), Smith (2016a), Vilasri et al. (2019), and Prokofiev (2021). Japanese names for the family Trachinidae, the genus *Trachinus* Linnaeus, 1758, and *Trachinus draco* Linnaeus, 1758 followed Abe (1977), who provided a comprehensive list of Japanese names for European fishes. The validity of *Uranoscopus tosae* (Jordan and Hubbs, 1925) and its Japanese name followed Yamada and Yagishita (2013). Institutional codes follow Sabaj (2020). Standard lengths (SL) were measured for all specimens, which are arranged herein in alphabetical order by species. Collector's name and affiliation are given where known (from ZUMT specimen ledger 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, type status (if applicable), collection locality, collection depth, collection date, collecting method, and collector or donator and affiliation. Remarks are given where applicable. Catalog numbers after ZUMT 62000 were newly given during this study.

Collection of Trachinidae and Uranoscopidae in ZUMT

Only a single specimen of the family Trachinidae was found in the ZUMT collection, probably having been obtained for inclusion in teaching material (an example of the suborder Trachinoidei) for fisheries science and/or ichthyology courses at The University of Tokyo.

Three genera and seven species of the family Uranoscopidae were represented by 80 specimens held in ZUMT, including three paratypes of *Uranoscopus flavipinnis* Kishimoto, 1987. Specimens were collected from 1909 to 1988, mainly in the later years, many representing Kanagawa to Wakayama Prefectures on the Pacific coast of Japan and the East China Sea. In addition, specimens from the East China Sea were collected by *F/V Ten-yo-maru* (天洋丸), owned by Y. Tominaga (富永義昭). Most specimens were identified as *Uranoscopus japonicus* Houttuyn, 1782, *Uranoscopus oligolepis* Bleeker, 1879, or *Xenocephalus elongatus* (Temminck & Schlegel, 1843), the three species most commonly caught by bottom trawl on the continental shelf in temperate Japanese waters (Kishimoto 1984, 2001; Yamada et al. 2007; Yamada and Yagishita 2013).

Trachinidae ハチミシマ科

Trachinus Linnaeus, 1758 ハチミシマ属

Trachinus draco Linnaeus, 1758 ハチミシマ

ZUMT 5712: 125.9 mm SL, Black Sea, Sevastopol, Crimea Peninsula.

Uranoscopidae ミシマオコゼ科

Ichthyoscopus Swainson, 1839 サツオミシマ属

Ichthyoscopus pollicaris Vilasri, Ho, Kawai & Gomom, 2019 サツオミシマ

ZUMT 39389: 179.8 mm SL, southern Japan (details unknown).

ZUMT 50567: 270.0 mm SL, East China Sea, 13 Sept. 1959, Y. Tominaga (富永義昭).

ZUMT 50600: 236.2 mm SL, East China Sea, 1950, Y. Tominaga.

Uranoscopus Linnaeus, 1758 ミシマオコゼ属

Uranoscopus bicinctus Temminck & Schlegel, 1843 メガネウオ

ZUMT 2298: 245.5 mm SL, Nagasaki Pref., Japan, 3 July 1909, local name "Mishima-joroshu (ミシマジヨロシユ)".

ZUMT 41838: 192.7 mm SL, no data.

Remarks: Tanaka (1913b) described and figured this species based on a single specimen landed at the Tokyo Market, Japan (ZUMT 3633, 273 mm SL). However, that particular specimen was not found during this study.

Uranoscopus japonicus Houttuyn, 1782 ミシマオコゼ

ZUMT 13293: 176.5 mm SL, off Fukaura, Aomori Pref., Japan, 17 Nov. 1923, S. Tanabe (田辺貞夫), local name "Beko (ベコ)".

ZUMT 19033: 128.9 mm SL, Keelung, Taiwan, May 1928, H. Sato (Taipei Keelung Junior High School) [佐藤春吉 (台湾基隆中学校)].

ZUMT 19639: 199.6 mm SL, Genkai-nada Sea, Fukuoka Pref., Japan, before 1930, T. Matsumoto (Fukuoka Prefectural Moji Junior High School) [松本唯雄 (福岡県門司中学校)].

ZUMT 20510: 192.9 mm SL, off Naoetsu, Joetsu, Niigata Pref., Japan, 19 May 1909.

ZUMT 20823: 171.4 mm SL, Sagami Bay, Misaki, Kanagawa Pref., Japan.

ZUMT 21172: 148.8 mm SL, Shibushi Bay, Fukushima, Kushima, Miyazaki Pref., Japan, Miyazaki Prefectural Fukushima Village Fish Corp. (宮崎県福島村漁業組合).

ZUMT 23390: 145.0 mm SL, Kumano-nada Sea, Owase, Mie Pref., Japan, K. Nakahara (Mie Prefectural Owase Girls High School) [中原鋼作 (三重県尾鷲町尾鷲高等女学校校長)], local name "Mishimafugu (ミシマフグ)".

ZUMT 23455: 149.2 mm SL, off Niigata Pref., Japan, K. Igarashi (Niigata Girls High School) [五十嵐こづる (三重県尾鷲町尾鷲高等女学校校長)], local name "Ganko (ガンコ)".

ZUMT 23864: 136.5 mm SL; **ZUMT 23887:** 166.6 mm SL, probably Kagoshima Bay, Naya, Kagoshima, Kagoshima Pref., Japan, probably 1930, local name "Gata-anko (ガタアンコ)".

- ZUMT 24253:** 110.1 mm SL, Tosa Bay, Mimase, Kochi, Kochi Pref., Japan, 15 Jan. 1932, T. Kamohara (蒲原稔治).
- ZUMT 24345:** 127.0 mm SL, Miyazu, Kyoto, Japan, Nov. 1931, Kyoto Fishery School (京都府水産講習所).
- ZUMT 31260:** 122.9 mm SL, Matsue, Shimane Pref., Japan, R. Yanai (Shimane Prefectural Matsue High School) [柳井隆一 (島根県松江高校)].
- ZUMT 33704:** 130.8 mm SL, Enshu-nada Sea, off Maisaka, Hamamatsu, Shizuoka Pref., Japan, 1930, S. Ooe (Shizuoka Prefectural Hamamatsu Girls' Senior High School) [大恵尚一 (静岡県浜松高等女学校)].
- ZUMT 44065:** 122.9 mm SL, Wakayama Pref., Japan.
- ZUMT 46217:** 162.6 mm SL, Toyama Bay, Uozu or Namerikawa, Toyama Pref., Japan.
- ZUMT 47958:** 142.2 mm SL, East China Sea, Fukue-jima I., Goto Is., Mitsuiraku, Fukue, Goto, Nagasaki Pref., Japan, 22 May 1953, I. Tomiyama (富山一郎).
- ZUMT 49966:** 152.3 mm SL, East China Sea, Fukue-jima I., Goto Is., Nagasaki Pref., Japan, 10 June 1953, I. Tomiyama, 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 51013:** 119.7 mm SL, East China Sea, landed at Fukuoka Fish Market, Japan, 16 Mar. 1960, bottom trawl.
- ZUMT 56942:** 181.7 mm SL; **ZUMT 56943:** 188.5 mm SL, East China Sea, southeast of Tsushima Is., Nagasaki Pref., Japan (34° 20'42"N, 129° 56'37"E), 119–122 m depth, 10 July 1987, Y. Tominaga and M. Aizawa (*F/V No. 36 Ten-yo-maru*) [富永義昭・藍澤正宏 (第36天洋丸)].
- ZUMT 57682:** 93.9 mm SL, East China Sea, 5 May 1988.
Remarks: The left and right sides of the ventral preopercular edge of this specimen had three and four spines, respectively. Although *U. japonicus* usually has three spines on the ventral margin of the preopercle, numbers may range from three to six (Kishimoto 1987).
- ZUMT 62537:** 156.6 mm SL, Sagami Bay, Zaimokuza, Kamakura, Kanagawa Pref., Japan, 11 Apr. 1932, T. Abe (阿部宗明).
- ZUMT 62538:** 152.3 mm SL, no data.
- ZUMT ABE 10194:** 194.6 mm SL, locality and date unknown, probably collected by T. Abe.
- ZUMT ABE '62-300:** 163.9 mm SL, Sagami Bay, off Manazuru, Kanagawa Pref., Japan, collected between 11 Mar. 1962 to 21 Apr. 1962, T. Abe.

Remarks: Tanaka (1913a) described and figured this species based on a single specimen landed at Wakayama Market, Kii Province (currently Wakayama Prefecture), Japan (ZUMT 3472, 163 mm SL). However, that specimen was not found during this study.

Uranoscopus kishimotoi Fricke, 2018

(Fig. 1)

ZUMT 52228: 120.1 mm SL, probably East China Sea.

Remarks: This specimen was probably collected from the East China Sea by *F/V Ten-yo-maru*, since most of the specimens collected from that area by *F/V Ten-yo-maru* had similar registration numbers. However, locality, collector, and date information had not been recorded in the ledger. The species has also been recorded from Japan (details lacking) (Prokofiev 2021) and Taiwan (fully detailed, based on specimens) (Vilasri 2019). *Uranoscopus kishimotoi* is similar to *U. japonicus*, the two species sharing many diagnostic characters, including most meristics, ossified head features, and aspects of the anterior nostril (Fricke 2018; Prokofiev 2021). However, *U. kishimotoi* is distinguished from *U. japonicus* in having a tubular posterior nostril (vs. slit-like in the latter), prelingual filament short or absent in all ages (vs. a wide lamellar protrusion with a fringe along the edges when juvenile), white dorsal coloring predominating over dark, giving the effect of a thin dark vermiculate pattern on a white background (vs. rounded white spots or an irregular white-spotted marbled pattern, the dark areas being wide enough for the pattern to be perceived as light against a dark background), and 25 vertebrae in total (vs. 26 or 27) (Fig. 1; Fricke 2018; Prokofiev 2021).

Uranoscopus oligolepis Bleeker, 1878 キビレミシマ

ZUMT 31774: 142.0 mm SL, Tokyo Market, Japan, 6 May 1936, S. Inuo (犬尾三郎).

ZUMT 41499: 73.5 mm SL; **ZUMT 41529:** 114.7 mm SL, Toyama Bay, Uozu, Toyama Pref., Japan, June 1932, I. Tomiyama.

ZUMT 44426: 174.0 mm SL, Miyazu, Kyoto, Japan, 8 July 1903, Iizuka (飯塚; first name unknown).

ZUMT 45492: 70.8 mm SL; **ZUMT 46184:** 77.5 mm SL, Toyama Bay, Uozu or Namerikawa, Toyama Pref., Japan, I. Tomiyama.

ZUMT 46451: 147.6 mm SL, no data.

ZUMT 49897: 134.2 mm SL, East China Sea, Fukue-jima I., Goto Is., Nagasaki Pref., Japan, 10 June 1953, I. Tomiyama.

ZUMT 50604: 108.4 mm SL, Fukuoka Fish Market, Fukuoka Pref., Japan, Y. Tominaga.

ZUMT 51736: 67.2 mm SL; **ZUMT 51830:** 175.9 mm SL, East China Sea, 17 Aug. 1959, *F/V No. 51 Ten-yo-maru* (第 51 天洋丸).

ZUMT 54473: 124.7 mm SL; **ZUMT 54474:** 142.3 mm SL, Norin-kaiku 345 (農林 345 区), East China Sea (32° 35'N, 122° 40'E), 23 m depth, 11 Oct. 1984, *F/V No. 8 Ten-yo-maru* (第 8 天洋丸).

ZUMT 55110: 154.5 mm SL, female; **ZUMT 55111:** 116.9 mm SL, female; **ZUMT 55112:** 82.7 mm SL, male, paratypes of *Uranoscopus flavipinnis*, Suruga Bay, off Miho Peninsula, Shizuoka, Shizuoka Pref., Japan, 7–35 m depth, 8 Apr. 1979 to 4 July 1980.

Remarks: These specimens were designated by Kishimoto (1987) as three of the 38 paratypes of *U. flavipinnis*. The holotype of *U. flavipinnis* is registered as HUMZ 107319 and is still deposited at the Hokkaido University Museum, Hakodate, Hokkaido, Japan; the remaining paratypes of *U. flavipinnis* are registered in BMNH, HUMZ, MNHN, MSM, NSMT, RMNH, USNM, and YCM (Kishimoto 1987; Fricke et al. 2022). *Uranoscopus chinensis* Guichenot, 1882 and *U. flavipinnis* are currently treated as junior synonyms of *U. oligolepis* (Prokofiev 2021; Fricke et al. 2022).

ZUMT 63359: 160.0 mm SL, Kii Peninsula, Ukui, Nanki-katsuura, Higashimuro, Wakayama Pref., Japan.

Uranoscopus tosae (Jordan & Hubbs, 1925) ヤギミシマ

ZUMT ABE '59-689: 172.6 mm SL, locality and date unknown, T. Abe.

Xenocephalus Kaup, 1858 アオミシマ属

Xenocephalus elongatus (Temminck & Schlegel, 1843) アオミシマ

ZUMT 11495: 183.0 mm SL, off Onahama, Fukushima Pref., Japan, 36.6 m depth (20 fathoms), 16 Nov. 1922, S. Nakadaira (Fukushima Prefectural Onahama Fisheries Experimental Station) [中平貞次郎 (福島県小名浜水産試験場)], local name "Mishimafugu (ミシマフグ)".

ZUMT 11503: 155.6 mm SL, off Onahama, Fukushima Pref., Japan, S. Nakadaira.

ZUMT 13294: 139.7 mm SL, off Fukaura, Aomori Pref., Japan, 17 Nov. 1923, S. Tanabe, local name "Beko (ベコ)".

ZUMT 13315: 138.9 mm SL, off Cape Nyudo-zaki, Kitaura, Oga, Akita Pref., Japan, 24 Nov. 1923, S. Tanabe, local name "Beko (ベコ)".

ZUMT 20104: 201.6 mm SL; **ZUMT 20105:** 202.7 mm SL, Sagami Bay, Misaki, Kanagawa Pref., Japan.

ZUMT 23456: 147.8 mm SL; **ZUMT 24470:** 163.1 mm SL, off Niigata Pref., Japan, collected in 1931 or 1932, K. Igarashi.

ZUMT 25173: 164.5 mm SL, Toyooka, Hyogo Pref., Japan, T. Tsuchihashi (Hyogo Prefectural Toyooka Girls High School) [土橋忠重 (兵庫県豊岡高等女学校)].

ZUMT 25364: 130.1 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 Girls Normal School) [吉兼宗一 (愛知県女子師範学校)].

ZUMT 31483: 183.4 mm SL, Matsue, Shimane Pref., Japan, probably 1935, R. Yanai.

ZUMT 45322: 203.6 mm SL, Sagami Bay, off Odawara, Kanagawa Pref., Japan, F. Sakamoto (坂本福治), local name "Aokoze (アオオコゼ)".

ZUMT 46291: 217.0 mm SL; **ZUMT 46292:** 220.4 mm SL, probably Toyama Bay, Uozu or Namerikawa, Toyama Pref., Japan.

ZUMT 46561: 137.5 mm SL; **ZUMT 62549:** 150.3 mm SL; **ZUMT 62568:** 341.1 mm SL, no data.

ZUMT 50540: 202.8 mm SL; **ZUMT 50541:** 198.9 mm SL, Nagasaki Fish Market, Nagasaki Pref., Japan, 26 Aug. 1959, Y. Tominaga.

ZUMT 51031: 208.1 mm SL, East China Sea, landed at Fukuoka Fish Market, 16 Mar. 1960, bottom trawl.

ZUMT 51215: 191.1 mm SL, Norin-kaiku 158 (農林 158 区), East China Sea, 5 Dec. 1959, F/V No. 35 *Ten-yo-maru* (第 35 天洋丸).

ZUMT 51529: 157.8 mm SL, Norin-kaiku 304, 305, and 314 (農林 304, 305, and 314 区), East China Sea, 30 Mar. 1960.

ZUMT 51570: 132.2 mm SL, Norin-kaiku 266 (農林 266 区), East China Sea, 28 Mar. 1960.

ZUMT 54663: 7 specimens, 63.9–71.3 mm SL, Suruga Bay, off Mt. Kuno, Shizuoka, Shizuoka Pref., Japan, 9 May 1983, bottom trawl.

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References

- Abe, T. 1977. Appendix III, European fishes. Pp. 1141–1204. In: Seno, T. and Noda, K. (eds) Daigakusyorins neues wörterbuch Deutsch-Japanisch. Daigakusyorin, Tokyo. (In Japanese)
- Fricke, R. 2018. Two new species of stargazers of the genus *Uranoscopus* (Teleostei: Uranoscopidae) from the western Pacific Ocean. *Zootaxa*, 4476: 157–167.
- Fricke, R., Eschmeyer, W. N., Van der Laan, R. (eds) 2022. Catalog of fishes: genera, species, references. Electric version.
<http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>.
Accessed 31 March 2022.
- Imamura, H. and Odani, K. 2013. An overview of the phylogenetic relationships of the suborder Trachinoidei (Acanthomorpha: Perciformes). *Ichthyological Research*, 60: 1–15.
- Kishimoto, H. 1984. Uranoscopidae. Pp. 292–293, pl. 263. In: Masuda, H., Amaoka, K., Araga, C., Uyeno, T. and Yoshino, T. (eds) The fishes of the Japanese Archipelago. Tokai University Press, Tokyo.
- Kishimoto, H. 1987. A new stargazer, *Uranoscopus flavipinnis*, from Japan and Taiwan with redescription and neotype designation of *U. japonicus*. *Japanese Journal of Ichthyology*, 34: 1–14.
- Kishimoto, H. 2001. Uranoscopidae, stargazers. Pp. 3519–3531. In: Carpenter, K. E. and Niem, V. H. (eds) FAO Species Identification Guide for Fishery Purposes. The Living Marine Resources of the Western Central Pacific. Volume 4: Bony Fishes Part 4 (Labridae to Latimeriidae), estuarine crocodiles, sea turtles, sea snakes and marine mammals. FAO, Rome.

- Koeda, K., Hata, H., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. History of the fish collection of the Department of Zoology, The University Museum, The University of Tokyo. The University Museum, The University of Tokyo Material Reports, 129: 1–24. (In Japanese)
- Pequeño, G. 1989. Peces de Chile. Lista sistemática revisada y comentada. *Revista de Biología Marina, Valparaiso*, 24: 1–132.
- Roux, C. 1990. Trachinidae. Pp. 893–895. In: Quéro, J.-C., Hureau, J.-C., Karrer, C., Post, A. and Saldanha, L. (eds.) Check-list of the fishes of the eastern tropical Atlantic. Volume 3. CLOFETA. UNESCO, Paris.
- Sabaj, M. H. 2020. Codes for natural history collections in ichthyology and herpetology. *Copeia*, 108: 593–669.
- Smith, W. L. 2016a. Trachinidae, weeverfishes. Pp. 2769–2779. In: Carpenter, K. E. and De Angelis, N. (eds) The living marine resources of the Eastern Central Atlantic. Volume 3: Bony fishes part 1 (Elopiformes to Scorpaeniformes). FAO, Rome.
- Smith, W. L. 2016b. Uranoscopidae, stargazers. Pp. 2786–2792. In: Carpenter, K. E. and De Angelis, N. (eds) The living marine resources of the Eastern Central Atlantic. Volume 3: Bony fishes part 1 (Elopiformes to Scorpaeniformes). FAO, Rome.
- Tanaka, S. 1913a. Figures and descriptions of the fishes of Japan, including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea and southern Sakhalin, 11: 187–198, pls. 51–55.
- Tanaka, S. 1913b. Figures and descriptions of the fishes of Japan, including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea and southern Sakhalin, 15: 247–262, pls. 71–75.
- Pietsch, T. W. 1989. Phylogenetic relationships of trachinoid fishes of the family Uranoscopidae. *Copeia*, 1989: 253–303.
- Prokofiev, A. M. 2021. To the taxonomy of the stargazers of the genus *Uranoscopus* of the Indo-Pacific waters with a description of three new species (Uranoscopidae). *Journal of Ichthyology*, 61: 655–679.
- Vilasri, V. 2019. Family Uranoscopidae. Pp. 1097–1105. In: Koeda, K., and Ho, H.-C. (eds) Fishes of southern Taiwan. National Museum of Marine Biology & Aquarium, Pingtung.
- Vilasri, V., Ho, H.-C., Kawai, T. and Gomon, M. F. 2019. A new stargazer, *Ichthyoscopus pollicaris* (Perciformes: Uranoscopidae), from East Asia. *Zootaxa*, 4702: 49–59.
- Yamada, U., Tokimura, M., Horikawa, H. and Nakabo, T. 2007. Fishes and Fisheries of the East China Sea and Yellow Sea. Tokai University Press, Hadano. (In Japanese)
- Yamada, U. and Yagishita, N. 2013. Uranoscopidae, stargazers. Pp. 1277–1279, 2096–2097. In: Nakabo, T. (ed) Fishes of Japan with pictorial keys to the species, third edition. Tokai University Press, Hadano. (In Japanese)

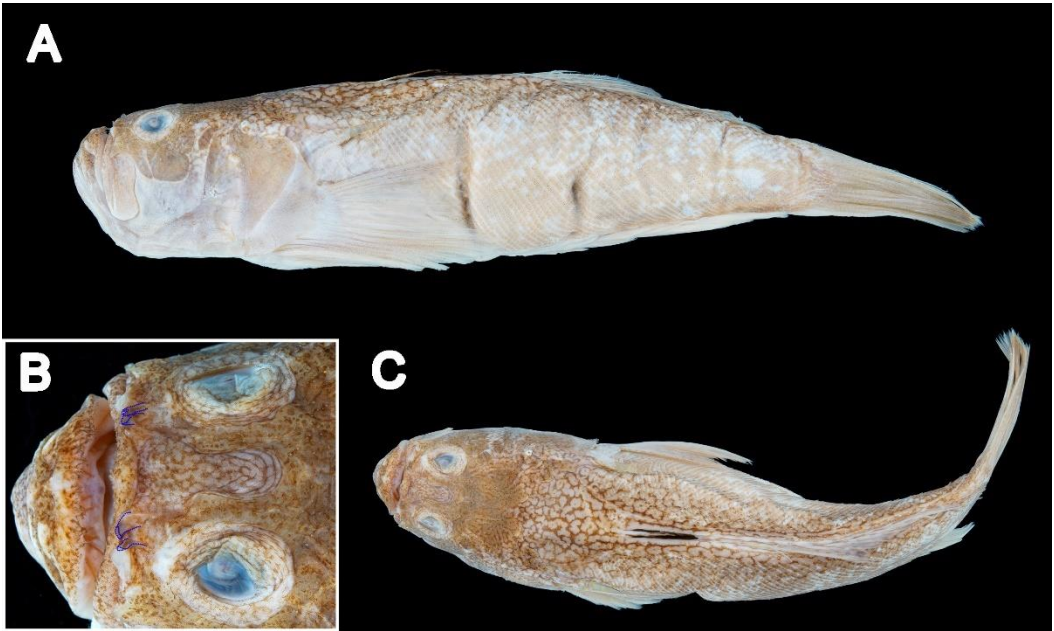


Fig. 1 Preserved specimen of *Uranoscopus kishimotoi* probably from the East China Sea (ZUMT 52228, 120.1 mm SL). A: lateral surface; B: close-up of dorsal surface of head (image reversed; nostrils outlined in dark blue); C: dorsal surface

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

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Abstract

The collection of Zeiformes (Teleostei) held in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT) comprise 171 lots, including 196 specimens representing five families, 11 genera and 15 species. Presence of the holotype of *Xenocyttus nemotoi* Abe, 1957 which was regarded as junior synonym of *Pseudocyttus maculatus* Gilchrist, 1906, was confirmed. Many specimens of several families which collected from New Zealand and Surinam were held in the collection. Various local names for Zeidae in each local region were listed with the specimens.

Introduction

The fish collection of Zeiformes (Teleostei) preserved in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT) were re-identified in the present study. The Zeiformes is a small order comprises seven families, mostly inhabit in deep-sea (Tyler et al. 2003). Some of the species of Zeidae and Oreosomatidae are fished and traded commercially. Especially the latter family is an important trade fish group which imported from southern hemisphere to Japan for more than 10,000 kg/year (Seafood Market Improvement Association 2021; Tokyo Metropolitan Central Wholesale Market Annual Report 2022). The specimens of the order held in ZUMT are listed below.

Materials and Methods

Identities of the specimens of Zeiformes in ZUMT were confirmed by the first author, generally following Ueno et al. (1983), James et al. (1988), Yearsley and Last (1998), Nakabo (2013), Kai and Tashiro (2019), and Mizumachi et al. (2022). Standard lengths (SL) were measured for all specimens. Species are arranged in alphabetical order. Local name, and collector's name and affiliation are given where known (from the specimen ledger or tag), with Japanese language equivalents in parentheses. The following list includes ZUMT number, SL, with number of specimens in parentheses when two or more, type (abbreviated when non-type), collection locality, collection date, collector or donator and affiliation, collection method, and remarks when available. The collection year and collector for some specimens was estimated

by following Koeda et al. (2022). Specimens stored in large tank were marked with an asterisk (*). Although, some of the ZUMT specimens collected by Dr. Abe had not been formally cataloged into the ZUMT collection (and the data of some specimens not retained), such specimens which can recognize by having underbar with the number on the accompanying label, are listed herein with the number ZUMT ABE XXXX, due to the possibility of future discovery of Dr. Abe's remaining catalog books with collection data. Catalog numbers after ZUMT 62000 are newly given during this study.

Collection of Zeiformes in ZUMT

Examination of the specimens of Zeiformes deposited in ZUMT comprised 171 lots, including 196 specimens representing five families, 11 genera and 15 species. 41 specimens of Zeniontidae and Oreosomatidae which collected from New Zealand and Surinam were held in the collection including holotype of *Xenocyttus nemotoi* Abe, 1957 which was presently regarded as a junior synonym of *Pseudocyttus maculatus* Gilchrist, 1906. Various local names in each local region for the species of Zeidae which commercially fished in Japan, were listed below.

Parazenidae ベニマトウダイ科

Cyttopsis Gill, 1862 カゴマトウダイ属

Cyttopsis rosea (Lowe, 1843) カゴマトウダイ

ZUMT 15493: 116.3 mm SL, Zushi (逗子), Kanagawa Pref., 24 Nov. 1924, S. Miyashiro (宮代周輔).

ZUMT 24249: 94.0 mm SL; **ZUMT 24250:** 84.6 mm SL; **ZUMT 24251:** 89.9 mm SL, Mimase (御豊瀬), Kochi Pref., 15 Jan. 1932, T. Kamohara (蒲原稔治).

ZUMT 25351: 107.7 mm SL, 400 m off Onahama (小名浜), Fukushima Pref., 16 Dec. 1932, S. Tsunoda (角田春齐).

ZUMT 25267: 60.2 mm SL, off 200 hiro (尋=360 m) south of Shima (志摩), landed at Market of Toyohama Fishing Port (豊浜漁港市場), 31 Mar. 1933, S. Yoshikane (吉兼宗一).

ZUMT 33231: 87.5 mm SL, locality doubtful, nearby Taraika (多来加; currently Patience), Karafuto (樺太; currently Sakhalin), K. Sakamoto (坂本喜一), Hamamatsu Second Junior High School (浜松第二中学校).

Remarks: The similar doubtful situation confirmed on *Peristedion orientale* Temminck & Schlegel, 1843 (Peristediidae). See remarks of Wada et al. (2022c).

ZUMT 33706: 84.6 mm SL, Maisaka (舞坂), Shizuoka Pref., S. Ooe (大恵尚一), Hamamatsu Girls High School (浜松高等女学校).

ZUMT 33973: 119.2 mm SL, Hamamatsu (浜松), Shizuoka Pref., N. Ishiuchi (石内直太郎) at Hamamatsu Normal School (浜松師範).

ZUMT 34072: 67.4 mm SL, Onahama, Fukushima Pref., S. Tsunoda.

ZUMT 35250: 98.0 mm SL; **ZUMT 35251:** 72.9 mm SL, Hamamatsu, Shizuoka Prefecture, S. Araki (荒木精一) (Women's High School, Hamamatsu City) (浜松市立浜松高等女学校).

ZUMT 59317: 76.5 mm SL; **ZUMT 59685:** 56.0 mm SL, off Nakaminato (那珂湊), Ibaraki Pref., 200–220 depth, 31 Oct. 1988, bottom trawl.

ZUMT 59318: 64.8 mm SL, Three Kings Ridge, 30°19.38'S, 172°58.68'E, 389–895 m depth, 14 Jan. 1990, stomach content of *Squalus mitsukurii* Jordan & Snyder, 1903 (Squalidae)(NSMT-P 32393).

Remarks: Although ZUMT 59318 was recorded as a stomach content of NSMT-P 32392, the specimen is an embryo of NSMT-P 32393. Therefore, we judged ZUMT 59318 is a stomach content of NSMT-P 32393.

ZUMT 63248: 82.9 mm SL, locality unknown.

ZUMT 63249: 8 specimens, 58.4–114.8 mm SL, Heda (戸田), Suruga Bay (駿河湾), Shizuoka Pref., 2 Feb. 1936.

ZUMT 63323: 105.4 mm SL, Heda, Suruga Bay, Shizuoka Pref., Oct. 1970.

Parazen Kamohara, 1935 ベニマトウダイ属

Parazen pacificus Kamohara, 1935 ベニマトウダイ

ZUMT 23467: 114.2 mm SL, Kochi Pref., 14 Dec. 1930, T. Kamohara, Kochi High School (高知高等学校).

ZUMT 23653: 73.5 mm SL, Urado (浦戸), Kochi Pref., 10 Apr. 1931, T. Kamohara, Kochi High School.

ZUMT 24257: 105.8 mm SL; **ZUMT 24258:** 91.0 mm SL; **ZUMT 24275:** 124.6 mm SL, Mimase, Kochi Pref., 15 Jan. 1932

ZUMT 32906 (previously NSMT-P 7185): 119.6 mm SL, Suruga Bay, 16–20 Sept. 1968.

ZUMT 39342: 168.6 mm SL, locality unknown.

ZUMT 47010: 132.1 mm SL; **ZUMT 47011:** 120.0 mm SL; **ZUMT 47113:** 74.4 mm SL, probably from Kochi, T. Kamohara.

Zeniontidae ソコマトウダイ科

Capromimus Gill, 1893 マメマトウダイ属

Capromimus abbreviatus (Hector, 1875) マメマトウダイ

ZUMT 56425 (tag T-73): 98.9 mm SL; **ZUMT 56426** (tag T-73): 85.4 mm SL; **ZUMT 59620:** 85.0 mm SL; **ZUMT 59621:** 88.6 mm SL; **ZUMT 59622:** 90.4 mm SL; **ZUMT 59623:** 84.3 mm SL; **ZUMT 59624:** 88.8 mm SL; **ZUMT 59625:** 71.2 mm SL; **ZUMT 59626:** 86.7 mm SL; **ZUMT 59627:** 87.3 mm SL; **ZUMT 59628:** 83.4 mm SL; **ZUMT 59629:** 88.8 mm SL; **ZUMT 59630:** 89.9 mm SL, Chatham Rise, New Zealand, 17 Mar. 1983, M. Aizawa.

ZUMT 63253 (cloth tag MAC 1355: Masahiro Aizawa Collection): 18: 59.6–88.4 mm SL, Chatham Rise (T-73), 43°37'S, 177°41'E, 372–374 m depth, 17 Mar. 1983.

Zenion Jordan & Evermann, 1896 ソコマトウダイ属

Zenion japonicum Kamohara, 1934 ソコマトウダイ

ZUMT 23520: 57.0 mm SL, Urado, Kochi Pref., 10 Apr. 1931, T. Kamohara, Kochi High School.

ZUMT 26047: 58.9 mm SL, Toyama Pref., 22 July 1933, K. Kikuchi (菊池勘左衛門), Toyama High School (富山高等学校).

ZUMT 33652: 49.6 mm SL; **ZUMT 33653**: 55.6 mm SL; **ZUMT 33654**: 57.4 mm SL, near Aichi Pref., 30 Oct. 1933, Aichi Prefectural Fisheries Station (愛知県水産試験場).

ZUMT 39365: 52.4 mm SL, locality unknown.

ZUMT 47210: 36.2 mm SL, probably Kochi Pref.

ZUMT 54653: 50.3 mm SL; **ZUMT 54654**: 41.3 mm SL; **ZUMT 54655**: 40.0 mm SL; **ZUMT 54656**: 43.2 mm SL; **ZUMT 54657**: 58.8 mm SL; **ZUMT 54658**: 64.6 mm SL, Suruga Bay, west of Senoumi (石花海), Shizuoka Pref., 225 m depth, 26 Sept. 1984, Saito (first name unknown), collected by F/V *Hinodemaru* (日の出丸).

Zenion sp. 1

ZUMT 59641: 96.8 mm SL; **ZUMT 59642**: 106.9 mm SL; **ZUMT 59643** (Fig. 1): 101.6 mm SL; **ZUMT 59644**: 76.4 mm SL; **ZUMT 59645**: 79.2 mm SL, Norfolk Island area, 16 Jan. 1975.

Remarks: This species has smaller eye with elongated body compared to *Zenion* sp. 2 (Fig. 1). Although *Zenion leptolepis* (Gilchrist & von Bonde 1924) is known widely from Indo-West Pacific, the advanced taxonomical study is necessary to identify this group.

Zenion sp. 2

ZUMT 59646: 65.0 mm SL; **ZUMT 59647**: 74.0 mm SL; **ZUMT 59648** (Fig. 1): 73.2 mm SL; **ZUMT 59649**: 61.1 mm SL; **ZUMT 59650**: 68.2 mm SL; **ZUMT 59651**: 57.6 mm SL; **ZUMT 59652**: 78.8 mm SL, west of South Fiji Basin, tropical Pacific area.

Remarks: ZUMT specimen ledger written as South Fiji Ridge (南フィジー海嶺), but is probably mistake of South Fiji Basin (南フィジー海盆). This species has huge eye with large head and oval-shaped body compared to *Zenion* sp. 1 (Fig. 1).

Zeidae マトウダイ科

Zenopsis Gill, 1862 カガミダイ属

Zenopsis filamentosa Kai & Tashiro, 2019 イトヒキカガミダイ

ZUMT 4796: 60.9 mm SL, Taiza (間人), Takeno (竹野), Tango (丹後)[currently Kyotango (京丹後)], 14 Aug. 1902, F. Azuma (東 文治).

Remarks: Local name “Bato”.

ZUMT 11512: 174.4 mm SL, Onahama, Fukushima Pref., 19 Nov. 1922, T. Nakahira (中平貞次郎)(Fukushima Prefectural Fisheries Station at Onahama).

Remarks: Local name “Gamidai”.

ZUMT 23862: 150.9 mm SL, Naya (納屋) [currently Nakamachi and Kinsei-cho (中町・金生町)], Kagoshima Pref.

Remarks: Local name “Waide” is an idiom of “Washidai”.

ZUMT 34084: 78.8 mm SL; **ZUMT 34089:** 69.6 mm SL, Onahama, Fukushima Pref., S. Tsunoda (Fukushima Prefectural Fisheries Station at Onahama).

ZUMT 51053*: 235.8 mm SL, Norin Area 265, East China Sea, 1 Mar. 1960.

ZUMT 63321: 193.2 mm SL, near Kesen (氣仙), Rikuzen (陸前), Iwate Pref., 15 Dec. 1925.

ZUMT 63337 (cloth tag Abe 62): 97.1 mm SL, locality unknown.

ZUMT 63423: 160.7 mm SL, Fukuoka City, Fukuoka Pref., 27 Aug. 1931.

Zenopsis nebulosa (Temminck & Schlegel, 1845) カガミダイ

ZUMT 11528*: 189.7 mm SL, Taiza, Takeno, Tango (currently Kyotango), 14 Aug. 1902, F. Azuma.

ZUMT 13119: 92.7 mm SL, Shirahamazaki (白浜崎) or Fudozaki (不動崎), Miyako Bay (宮古湾), S. Tanabe (田辺貞夫).

ZUMT 16297: 49.9 mm SL, Kesen, Iwate Pref., 10 Aug. 1925.

ZUMT 18902: 66.1 mm SL, Kanagawa Pref., Kanagawa Prefectural Hiratsuka Town Suga Elementary School.

ZUMT 22041: 78.9 mm SL, near Wakayama City, Wakayama Pref., Jan. 1920.

ZUMT 25253: 81.1 mm SL, off Onahama, Sept. 1931, S. Tsunoda.

ZUMT 31498* (cloth tag 244): 357.2 mm SL, Matsue (松江), Shimane Pref., Nov. 1935, T. Yanai (柳井隆一), Matsue High School (松江高校).

ZUMT 34001: 56.6 mm SL, Yokohama (横浜) or Ninomiya (二宮), Kanagawa Pref.

ZUMT 34085: 83.0 mm SL; **ZUMT 34086:** 85.0 mm SL; **ZUMT 34087:** 106.7 mm SL;

ZUMT 34088: 73.8 mm SL, Onahama, Fukushima Pref., S. Tsunoda.

ZUMT 40661: 154.7 mm SL, locality unknown.

Remarks: Although the collection locality was written as “probably Morioka (盛岡か?)”, Morioka is a city located inland.

ZUMT 46171*: 285.9 mm SL, Namerikawa (滑川), Uozu (魚津), Toyama Pref.

ZUMT 49875: 153.9 mm SL, Fukue (福江), Fukue-jima Island (福江島), Goto Islands (五島列島), 10 June 1953, I. Tomiyama (冨山一郎).

ZUMT 51241*: 193.9 mm SL, East China Sea, collected at fish landing ground of Fukuoka Fish Market, 24 Dec. 1959, Y. Tominaga.

ZUMT 52285: 95.0 mm SL, Norin Area 253–254, East China Sea, arrival in port at 5 May 1960, F/V No. 1 and No. 2 *Shotokumaru* (第1、第2昭徳丸), bottom trawl.

ZUMT 63320 (cloth tag T-19): 167.7 mm SL, locality unknown.

ZUMT ABE 62-322: 74.1 mm SL; **ZUMT ABE 62-324:** 57.2 mm SL; **ZUMT ABE 62-325:** 61.1 mm SL; **ZUMT ABE 62-326:** 54.2 mm SL; **ZUMT ABE 62-327:** 48.9 mm SL;

ZUMT ABE 62-328: 50.7 mm SL; **ZUMT ABE 62-329**: 49.0 mm SL; **ZUMT ABE 62-330**: 46.6 mm SL; **ZUMT ABE 62-331**: 36.3 mm SL; **ZUMT ABE 62-332**: 37.3 mm SL; **ZUMT ABE 62-333**: 39.4 mm SL, Manazuru (真鶴), Kanagawa Pref., 17 Mar.–2 Apr. 1962.

Zeus Linnaeus, 1758 マトウダイ属
Zeus faber Linnaeus, 1758 マトウダイ

ZUMT 11532*: 228.7 mm SL, Onahama, Fukushima Pref., T. Nakahira.

ZUMT 13051*: 267.2 mm SL, Sokeimura Beach (磯鶏村海岸), Shimohei-gun (下閉伊郡), 1914–1924, Iwate Pref., S. Tanabe.

Remarks: Local name “Matoyo”.

ZUMT 13249* (cloth tag 30 鮫): 263.1 mm SL; **ZUMT 13250**: 33.2 mm SL, Nara Fishing area (奈良漁場), Shirogane-maehama (白金前濱), Hamasuka (浜須賀), probably Miyagi Pref., 27 Oct. 1923, S. Tanabe.

Remarks: Detail locality of “Nara Fishing area, Shirogane-maehama, Hamasuka” could not find, because the local name “Hamasuka” is known from several localities in Japan. We estimated the locality is in Tohoku area, because S. Tanabe provided many specimens from this area in 1920’s. Local name “Baibai”.

ZUMT 13281*: 179.7 mm SL, off Fukaura (深浦沖合), Nishi-tsugaru-gun (西津軽郡), Aomori Pref., May 1923, S. Tanabe.

Remarks: Local name “Matodai”.

ZUMT 13366*: 170.2 mm SL, 12 miles off Nyudozaki (入道崎沖合 12 哩), Oga Peninsula (男鹿半島), Akita Pref., 1914–1924, S. Tanabe.

Remarks: Local name “Kanetataki”.

ZUMT 13881: 86.8 mm SL, Kesen, Iwate Pref., 2 Jan. 1925, G. Toba (鳥羽源蔵), Iwate Prefecture Normal School (岩手県師範学校).

ZUMT 16382: 39.4 mm SL, Kesen, Iwate Pref., 20 Aug. 1925, G. Toba.

ZUMT 20535: 70.6 mm SL; **ZUMT 20536**: 81.6 mm SL, Wakayama Pref., Jan. 1920.

ZUMT 20902: 114.8 mm SL, Misaki (三崎), Miura (三浦), Kanagawa Pref.

ZUMT 23183: 61.3 mm SL; **ZUMT 23184**: 69.3 mm SL, Kimoto (木本), Mie Pref., 3 May 1930, Y. Tsuchiga (槌賀安平), Kimoto Junior High School (木本中学校).

Remarks: Local name “Matohage”.

ZUMT 23367: 120.9 mm SL, Owase (尾鷲), Mie Pref., T. Nalahara (中原綱作).

Remarks: Local name “Matou-uo”.

ZUMT 23951: 75.5 mm SL, Naya (currently Nakamachi and Kinsei-cho), Kagoshima Pref.

Remarks: Local name “Washide”.

ZUMT 24954 (cloth tag 93): 91.9 mm SL, Horiemura Beach (堀江村海岸), Onsen-gun (温泉郡), Ehime Pref., Oct. 1931, J. Ishikawa (石川重次郎), Matsuyama Women's High School (松山高等女学校).

- ZUMT 25274:** 79.7 mm SL, off Onahama, Fukushima Pref., S. Tsunoda, Fukushima Prefectural Onahama Elementary School.
- ZUMT 27918** (cloth tag 0.45): 81.7 mm SL, probably southern Japan (南日本?).
Remarks: Local name “Matouo”.
- ZUMT 31293** (cloth tag No. 66): 128.6 mm SL, Matsue, Shimane Pref., Nov. 1935, T. Yanai, Matsue High School.
- ZUMT 32389:** 40.3 mm SL, Toyama Bay (富山湾), 14 Sept. 1935, H. Yamashita (山下博三).
- ZUMT 33962:** 336.5 mm SL, Kochi Pref., Aug. 1904, S. Tanaka (田中茂穂).
- ZUMT 34002:** 50.7 mm SL, Yokohama or Ninomiya, Kanagawa Pref.
- ZUMT 36426:** 122.3 mm SL, Hayama (葉山), Kanagawa Pref., Aug. 1936, S. Inuo (犬尾三郎).
- ZUMT 41248*:** 147.1 mm SL, Namerikawa, Uozu, Toyama Pref., 1931, I. Tomiyama.
- ZUMT 44248:** 33.6 mm SL, Odawara (小田原), Kanagawa Pref.
- ZUMT 47781:** 125.8 mm SL, Mera (布良), Tateyama (館山), Chiba Pref., collected from Tokyo Market (東京市場), 11 Sept. 1952.
- ZUMT 47893:** 67.2 mm SL, Tamanoura (玉之浦), Fukue-jima Island, Goto Islands, 23 May 1953, I. Tomiyama.
- ZUMT 48026:** 36.2 mm SL; **ZUMT 48027:** 72.3 mm SL, Hirado (平戸), Matsuura-gun (松浦郡), Nagasaki Pref., 29 May 1953, I. Tomiyama.
- ZUMT 49132:** 128.9 mm SL, Misaki, Miura, Kanagawa Pref., 1956, I. Tomiyama.
- ZUMT 49876*:** 179.8 mm SL, Fukue, Fukue-jima Island, Goto Islands, 10 June 1953, I. Tomiyama.
- ZUMT 51340:** 105.0 mm SL, near Fukuoka, collected at Fukuoka Fish Market, Oct.-Dec. 1959, Y. Tominaga.
- ZUMT 52099:** 162.8 mm SL; **ZUMT 52127:** 142.2 mm SL, Norin Area 253–254, East China Sea, landed at Fukuoka Fish Market.
- ZUMT 56913:** 171.8 mm SL; **ZUMT 57643:** 155 mm SL, East China Sea, 9 May 1988, probably Y. Tominaga.
- ZUMT 57628:** 62.0; 71.6 mm SL, East China Sea, 7 May 1988.
- ZUMT 63325:** 40.0 mm SL, locality unknown, written as Yodomi Kanashiro “ヨドミ カナシロ”.
- ZUMT 63422:** 191.9 mm SL, Nishimon-machi Market (西門町市場), Taipei (台北), Taiwan, 1 May 1929.
- ZUMT 47933*:** 185.0 mm SL; **ZUMT 63319*** (cloth tag T-4): 291 mm SL; **ZUMT 63326:** 65.5 mm SL; **ZUMT 63327:** 55.4 mm SL; **ZUMT 63328:** 60.0 mm SL; **ZUMT 63329:** 47.1 mm SL; **ZUMT 63334** (cloth tag 8904): 137.3 mm SL; **ZUMT 63335** (cloth tag 8973): 132.1 mm SL; **ZUMT 63336** (cloth tag 7790): 117.0 mm SL, locality unknown.

Oreosomatidae オオメマトウダイ科
Allocyttus McCulloch, 1914 オオメマトウダイ属
Allocyttus niger James, Inada & Nakamura, 1988 クロマトウダイ

ZUMT 59673: 74.1 mm SL, off Suriname, 15 Dec. 1979.

ZUMT 59680 (MAC 1203): 213.1 mm SL, Chatham Rise (T-33), 44°26'S, 173°53'E, 733–737 m depth, 8 Mar. 1983.

Allocyttus verrucosus (Gilchrist, 1906)

ZUMT 59674: 28.9 mm SL, off Suriname, 15 Dec. 1979.

Remarks: Although Nakabo and Kai (2013) showed the illustration of this specimen as a juvenile of *Allocyttus folletti* Myers, 1960 collected from stomach contents of *Katsuwonus* or *Thunnus* collected at northern Pacific Ocean, ZUMT specimen ledger revealed that the specimen collected from off Suriname, and was herein identified to *A. verrucosus*.

Neocyttus Gilchrist, 1906 ツノマトウダイ属
Neocyttus rhomboidalis Gilchrist, 1906 ツノマトウダイ

ZUMT 56427 (cloth tag T-73): 121.9 mm SL, Chatham Rise, New Zealand, 17 Mar. 1983, M. Aizawa (藍澤正宏).

ZUMT 59677: 99.3 mm SL; **ZUMT 63249:** 113.4 mm SL; **ZUMT 63250:** 109.4 mm SL; **ZUMT 63251:** 98.6 mm SL; **ZUMT 63252:** 101.6 mm SL, locality unknown.

Oreosoma Cuvier, 1829 ガクガクギョ属
Oreosoma atlanticum Cuvier, 1829 ガクガクギョ

ZUMT 59672: 70.8 mm SL, off Suriname, 15 Dec. 1979.

Pseudocyttus Gilchrist, 1906 ヒョウマトウダイ属
Pseudocyttus maculatus Gilchrist, 1906 ヒョウマトウダイ

ZUMT 49756 (previously ABE 55-111): 125.8 mm SL, holotype of *Xenocyttus nemotoi* Abe, 1957, Antarctic Ocean, 64°32'S, 115°25'E, 15 Jan. 1955, stomach content of Fin whale.

Remarks: *Xenocyttus nemotoi* is regarded as a junior synonym of *Pseudocyttus maculatus*.

ZUMT 56429: 165.8 mm SL, dissected, Chatham Rise, New Zealand, 17 Mar. 1983, M. Aizawa.

ZUMT ABE 17653: 174.0 mm SL, New Zealand, 15 Dec. 1971.

Grammicolepididae ヒシマトウダイ科
Xenolepidichthys Gilchrist, 1922 ヒシマトウダイ属
Xenolepidichthys dalgleishi Gilchrist, 1922 ヒシマトウダイ

ZUMT 54387: 72.2 mm SL; **ZUMT 54388**: 83.6 mm SL; **ZUMT 54389**: 84.8 mm SL, off Heda (戸田), Numazu (沼津), Shizuoka Pref., 21 Dec. 1940, Dainichi-maru.

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We are deeply grateful to the late Y. Tominaga for his dedication and efforts to the ZUMT collection. We are also grateful to H. Hata (National Museum of Nature and Science), I. Abe, S. Fujiwara, A. Iinuma, M. Saito, A. Takahashi (Tokyo University of Marine Science and Technology), M. Fukatani, S. Ito (University of Tokyo), and H. Ogata (ZUMT) for curatorial assistance. G. S. Hardy (Ngunguru, New Zealand) kindly improved the English in the manuscript. The present study was supported in part by JSPS KAKENHI 21K06313 JP and the Sasakawa Scientific Research Grant from The Japan Science Society (2021-4064) to the first author.

References

- James, G. D., Inada, T. and Nakamura, I. 1988. Revision of the oreosomatid fishes (Family Oreosomatidae) from the southern oceans, with a description of a new species. *New Zealand Journal of Zoology*, 15: 291–326.
- Kai, Y. and Tashiro, F. 2019. *Zenopsis filamentosa* (Zeidae), a new mirror dory from the western Pacific Ocean, with redescription of *Zenopsis nebulosa*. *Ichthyological Research*, 66: 340–352.
- Koeda, K., Hata, H., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. History of the fish collection of the Department of Zoology, The University Museum, The University of Tokyo. *The University Museum, The University of Tokyo Material Reports*, 129: 1–24. (In Japanese)
- Mizumachi, K., Nakayama, T., Teramura, A. and Endo, H. 2022. First record of *Cyttopsis cypho* (Zeiformes: Parazenidae) from Japan and morphological comparisons with *Cyttopsis rosea*. *Japanese Journal of Ichthyology*. DOI: 10.11369/jji.21-027. (In Japanese with English Abstract)
- Nakabo, T. 2013. *Fishes of Japan with pictorial keys to the species*, third edition. Tokai University Press, Hadano. xlix+2428 pp. (In Japanese)
- Seafood Market Improvement Association. 2021. Standard Japanese names of imported foreign fishes (18th edition). *Annual Report of Fish Information Center and Museum*, (40): 5–15. (In Japanese)

- Tokyo Metropolitan Central Wholesale Market Annual Report. 2022. Market statistics (monthly and annual reports). <https://www.shijou-tokei.metro.tokyo.lg.jp/> Accessed 5 April 2022. (In Japanese)
- Tyler, J. C., O'Toole, B. and Winterbottom, R. 2003. Phylogeny of the genera and families of zeiform fishes, with comments on their relationships with Tetraodontiforms and Caproids. *Smithsonian Contributions to Zoology*, 618: 1–110.
- Ueno, T., Matsuura, K. and Fujii, E. 1983. Fishes trawled off Suriname and French Guiana. Japan Marine Fishery Resource Research Center, Tokyo. (In Japanese and English)
- Yearsley, G. K. and Last, P. R. 1998. *Neocyttus psilorhynchus*, a new oreosomatid (Pisces, Zeiformes) from southern Australia and New Zealand, with redescription of its congeners. *New Zealand Journal of Marine and Freshwater Research*, 32: 555–579.

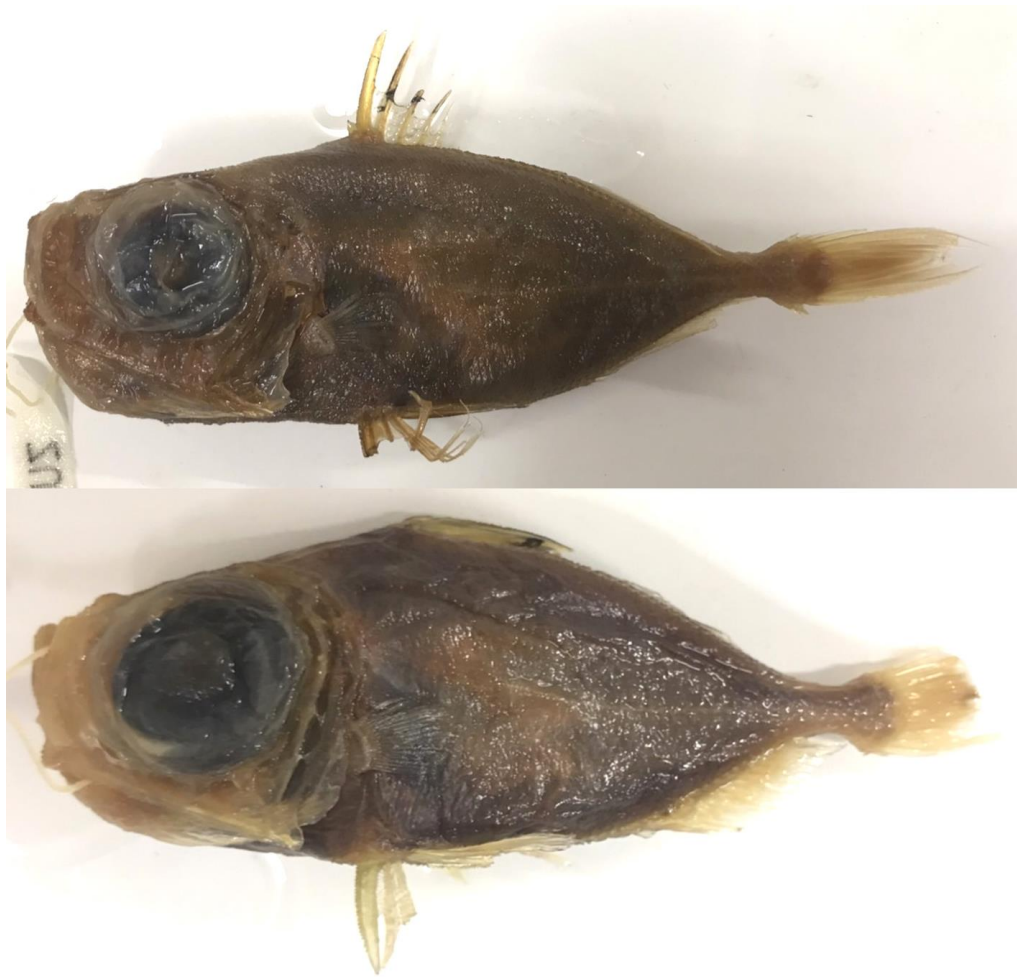


Figure 1. Preserved specimens of *Zenion* sp. 1 (ZUMT 59643; upper) and *Zenion* sp. 2 (ZUMT 59648; lower).

Report on the specimens of family Pomacanthidae (Teleostei: Perciformes) deposited in the Department of Zoology, The University Museum, The University of Tokyo

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Abstract

The collection of Pomacanthidae (Teleostei: Perciformes) held in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT) comprise 301 lots, including 306 specimens representing seven genera and 38 species, most of which were collected in 1960's and 1970's. Although in total seven holotypes and three paratypes have known from ZUMT collection, holotype of *Acanthochaetodon nigrolunatus* Tanaka, 1918 could not find during our investigation.

Introduction

The angelfishes family Pomacanthidae (Teleostei: Perciformes) have bright colors, and highly demanded in the tropical fish aquarium trade. Most of them inhabit in rocky or coral reefs, and form a harem consisting of one male and several females (Senou 2018). Seven genera of 32 species had known from Japanese waters, and Wada et al. (2022) recently reported an additional species, *Centropyge abei* Allen, Young & Colin, 2006, as a new Japanese record.

Although the fish collection in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT) was mainly acquired from Japan and overseas during the late 18th and early 19th centuries, the specimens of family Pomacanthidae is mostly collected in 1960's and 1970's. This is because the taxon was studied by the late Dr. Yoshiaki Tominaga. During his research, he collected a large number of angelfishes not only from Japan but also from overseas by specimen exchanging with other museum collections and purchasing from tropical fish stores. The specimens of the family held in ZUMT are listed below.

Materials and Methods

Identities of the specimens of Pomacanthidae in ZUMT were confirmed by the first author, generally following Allen et al. (1998) and Shimada (2013), with confirmation of at least one diagnostic character. When the diagnostic coloration of the specimen was disappeared due to the long-term preservation, we followed the identification of Dr. Tominaga, which usually recorded on the ZUMT specimen ledger, bottles, or tags. Standard lengths (SL) were measured for all specimens, which are arranged in alphabetical order by species. Local name, and

collector's name and affiliation are given where known (from the specimen ledger or tag), with Japanese language equivalents in parentheses. The following list includes ZUMT number, SL, with number of specimens in parentheses when two or more, type (abbreviated when non-type), collection locality, collection date, collector or donator and affiliation, collection method, and remarks when available. The collection year and collector for some specimens was estimated by following Koeda et al. (2022). Although, some of the ZUMT specimens collected by Dr. Abe had not been formally cataloged into the ZUMT collection (and the data of some specimens not retained), such specimens which can recognize by having underbar with the number on the accompanying label, are listed herein with the number ZUMT ABE XXXX, due to the possibility of future discovery of Dr. Abe's remaining catalog books with collection data.

Collection of Pomacanthidae in ZUMT

Examination of the specimens of Pomacanthidae deposited in ZUMT comprised 301 specimens [38 species in seven genera] in 306 lots, including the six holotypes of *Centropyge interrupta* (Tanaka, 1918), *Chaetodontoplus caeruleopunctatus* Yasuda & Tominaga, 1976, *Genicanthus watanabei* (Yasuda & Tominaga, 1970), *Holacanthus albofasciatus* Tanaka, 1909, *Holacanthus fucosus* Yasuda & Tominaga, 1970, and *Holacanthus venustus* Yasuda & Tominaga, 1969, and three paratypes of *Genicanthus personatus* Randall, 1975, *Genicanthus spinus* Randall, 1975 and *G. watanabei*. However, the holotype of *Acanthochaetodon nigrolunatus* Tanaka, 1918 "Getten-yakko" (ZUMT 8344; Tokyo fish market, probably from Izu, Shizuoka Pref.) could not find during our investigation. Although the taxonomical position of the species has never discussed, we judged this species is a junior synonym of *Pomacanthus semicirculatus* (Cuvier, 1831) on the basis of the description of Tanaka (1918).

Pomacanthidae キンチャクダイ科

Apolemichthys Burton, 1934 シテンヤッコ属

Apolemichthys trimaculatus (Cuvier, 1831) シテンヤッコ

ZUMT 52510: 129.8 mm SL; **ZUMT 52513:** 166.7 mm SL; **ZUMT 52514:** 152.8 mm SL; **ZUMT 52517:** 164.9 mm SL, Seragaki (瀬良垣), Onna (恩納), Okinawa-jima Island, 14 July 1967.

ZUMT 52530: 113.1 mm SL; **ZUMT 52531:** 156.5 mm SL; **ZUMT 52533:** 128.5 mm SL, Nagannu Atoll (ナガンヌ環礁), Keise-jima Island (慶伊瀬島), off west of Okinawa-jima Island, 14 Apr. 1970.

ZUMT 52542: 136.9 mm SL; **ZUMT 52543:** 151.7 mm SL; **ZUMT 52544:** 122.9 mm SL; **ZUMT 52545:** 144.1 mm SL, Okinawa Islands, purchased from Okinawa Kaigyoen (沖縄海魚園), received on 14 Apr. 1970.

ZUMT 52568: 118.8 mm SL (stained and dissected); **ZUMT 52569:** 141.6 mm SL; **ZUMT 52570:** 144.9 mm SL; **ZUMT 52571:** 150.8 mm SL; **ZUMT 52572:** 152.9 mm SL; **ZUMT 52573:** 106.8 mm SL; **ZUMT 52574:** 110.2 mm SL; **ZUMT 52575:** 95.0 mm SL; **ZUMT 52712:** 99.9 mm SL; locality unknown.

Remarks: Although the preserved coloration of the species is pale without black pigmentation on body side, ZUMT 52572 had dusky black pigmentation on its body sides. This specimen is estimated as piebald from its coloration.

ZUMT 52721: 126.0 mm SL, Okinawa-jima Island, purchased from tropical fish fisherman, 1968.

ZUMT 52732: 149.4 mm SL; **ZUMT 52733:** 139.6 mm SL; **ZUMT 52734:** 126.9 mm SL, locality unknown, purchased from tropical fish store, 1967.

ZUMT 52755: 160.7 mm SL, Izu Ocean Park (伊豆海洋公園), Ito (伊東), Shizuoka Pref., 1960's.

ZUMT 63347; ZUMT 63348; ZUMT 63349; ZUMT 63350, locality unknown, preserved in large tank.

ZUMT ABE 6056: 136.9 mm SL, Palau, 1936–1937, T. Abe.

Centropyge Kaup, 1860 アブラヤッコ属
Centropyge bicolor (Bloch, 1787) ソメワケヤッコ

ZUMT 16708: 52.0 mm SL, Yokosuka (横須賀), Kanagawa Pref., H. Tsubota (坪田久福) at Yokosuka Junior Highschool (横須賀中学校).

ZUMT 52519: 94.0 mm SL; **ZUMT 52521:** 68.7 mm SL; **ZUMT 52524:** 61.3 mm SL, Seragaki, Onna, Okinawa-jima Island, 14 Nov. 1967.

ZUMT 52526: 83.8 mm SL, Nagannu Atoll, Keise-jima Island, off west of Okinawa-jima Island, 11 Nov. 1967.

ZUMT 52547: 85.0 mm SL; **ZUMT 52548:** 66.8 mm SL; **ZUMT 52549:** 57.3 mm SL; **ZUMT 52550:** 63.3 mm SL; **ZUMT 52551:** 74.3 mm SL; **ZUMT 52552:** 72.0 mm SL; **ZUMT 52553:** 62.4 mm SL; **ZUMT 52554:** 64.6 mm SL; **ZUMT 52555:** 68.3 mm SL; **ZUMT 52556:** 63.7 mm SL, Okinawa Islands, purchased from Okinawa Kaigyoen, received on 14 Apr. 1970.

ZUMT 52716: 67.2 mm SL; **ZUMT 52717:** 55.4 mm SL, locality unknown.

ZUMT 52729: 61.0 mm SL; **ZUMT 52832:** 80.0 mm SL (stained and dissected), Okinawa-jima Island, purchased from tropical fish fisherman, 1968.

ZUMT 52764: 82.0 mm SL, Izu Ocean Park, Ito, Shizuoka Pref., 1960's.

ZUMT 55393: 35.0 mm SL; **ZUMT 55394:** 40.4 mm SL; **ZUMT 55395:** 73.9 mm SL, Pila Pila Beach, Rabaul, Independent State of Papua New Guinea, 4 June 1970.

ZUMT 63339 (plastic tag MA-069): 74.7 mm SL, Kii Peninsula (紀伊半島), 1970's, donation from Shirahama Aquarium, Kyoto University (京都大学白浜水族館) to M. Aizawa.

Centropyge bispinosa (Günther, 1860) ルリヤッコ

ZUMT 52563: 66.3 mm SL, donation from Keikyū Aburatsubo Marine Park (京急油壺水族館), received on April 1973.

ZUMT 63318: 58.6 mm SL, Onna, Okinawa-jima Island, 11 Apr. 1973.

Centropyge eibli Klausewitz, 1963 (流通名:エイブルズエンゼル)

ZUMT 55373: 68.6 mm SL, Phuket, Thailand, Jan. 1975.

ZUMT 52840: 66.2 mm SL, locality unknown.

Centropyge ferrugata Randall & Burgess, 1972 アカハラヤッコ

ZUMT 52718: 68.7 mm SL; ZUMT 52719: 69.1 mm SL; ZUMT 52720: 61.9 mm SL; ZUMT 52842: 49.9 mm SL (stained and dissected), locality unknown.

ZUMT 52766: 66.8 mm SL, Izu Ocean Park, Ito, Shizuoka Pref., 1960's.

ZUMT 52792: 57.4 mm SL, Nagannu Atoll, Keise-jima Island, off west of Okinawa-jima Island, 11 Nov. 1967.

ZUMT 52798: 62.5 mm SL, Seragaki, Onna, Okinawa-jima Island, 11 Nov. 1967.

ZUMT 55391: 60.2 mm SL; ZUMT 55392: 50.4 mm SL, Seragaki, Onna, Okinawa-jima Island, 14 Nov. 1967.

ZUMT 64157: 73.0 mm SL, Hachijo-jima Island.

Centropyge fisheri (Snyder, 1904) チャイロヤッコ

ZUMT 55370: 29.4 mm SL; ZUMT 55371: 37.7 mm SL; ZUMT 55372: 51.1 mm SL, previously BPBM 7307, Oahu Island, Hawaiian Islands, 10 Aug. 1968, J. E. Randall and University of Hawaii.

ZUMT 52789: 42.9 mm SL, Osezaki (大瀬崎), Numazu (沼津), Shizuoka Pref., 21 Oct. 1972, Mr. Hosokawa.

ZUMT 52791 (one specimen stained and dissected): 4 specimens, 38.7–53.4 mm SL, Osezaki, Numazu, Shizuoka Pref., May 1972.

ZUMT 53967: 54.6 mm SL, Taiwan, purchased from tropical fish store at Taipei, Taiwan.

Centropyge flavissima (Cuvier, 1831) コガネヤッコ

ZUMT 52520: 78.0 mm SL; ZUMT 52522: 68.3 mm SL; ZUMT 52523: 67.1 mm SL, Seragaki, Onna, Okinawa-jima Island, 14 Nov. 1967.

ZUMT 52527: 64.6 mm SL, Nagannu Atoll, Keise-jima Island, off west of Okinawa-jima Island, 11 Nov. 1967.

ZUMT 52878: 55.6 mm SL, Taiwan, transported from Taipei to Yamamoto Marine Aquarium Shop (山本海水魚店).

ZUMT 53037: 83.5 mm SL; ZUMT 53038: 75.7 mm SL, Fanning Islands, Line Islands, coral reef near center of lagoon, 20–25 feet depth, J.E. Randall, J. McVey, and W. Hashimoto.

Centropyge heraldi Woods & Schultz, 1953 ヘラルドコガネヤッコ

- ZUMT 52535:** 89.4 mm SL, Nagannu Atoll, Keise-jima Island, off west of Okinawa-jima Island, 11 Nov. 1967.
ZUMT 52564: 86.3 mm SL, between Kuro-shima (黒島), Kohama-jima (小浜島), and Taketomi-jima islands (竹富島), 24 Nov. 1967.
ZUMT 52735: 81.8 mm SL, locality unknown, purchased from Marine Aquarium Shop, 1967.
ZUMT 52839: 92.9 mm SL; **ZUMT 52713:** 90.3 mm SL, locality unknown.

Centropyge interrupta (Tanaka, 1918) レンテンヤッコ

- ZUMT 8343:** 116.8 mm SL, holotype, Tanabe (田辺), Wakayama Pref., N. Ui (宇井縫蔵).
ZUMT 52760: 116.1 mm SL; **ZUMT 52761:** 90.9 mm SL; **ZUMT 52763:** 75.5 mm SL, Izu Ocean Park, Ito, Shizuoka Pref., 1960's.
ZUMT 52793: 52.5 mm SL, Jogasaki (城ヶ崎), Izu Peninsula (伊豆半島), Shizuoka Pref., 17 Sept. 1967.
ZUMT 55748: 125.8 mm SL, Abeno Beach (アベノ浜), Miyake-jima Island (三宅島), 22 Sept. 1973.
ZUMT 41075: 96.3 mm SL; **ZUMT 63355:** 118.7 mm SL, locality unknown.

Centropyge loriculus (Günther, 1874) (流通名: フレームエンゼル)

- ZUMT 53032:** 48.0 mm SL; **ZUMT 53033:** 52.2 mm SL; **ZUMT 53034:** 32.4 mm SL; **ZUMT 53035:** 36.2 mm SL; **ZUMT 53036:** 50.9 mm SL, outside barrier reef about 1/4 mile east of Teavarae Pass, Papara, Tahiti, 60–100 feet depth, 26 Feb. 1969, Randall, J.E., Allen, G.R., and Baker, B.A.
ZUMT 57504: 68.0 mm SL, northeast side of isolated reef, off north London Resettlement Area, Line Islands, Kiritimati (Christmas Island), 55 feet depth, July 1987, Pyle, R.L.
ZUMT 57565: 58.8 mm SL, Oahu Island, Hawaiian Islands, Apr. 1987, Pleffer, R.

Centropyge multifasciata (Smith & Radcliffe, 1911) シマヤッコ

- ZUMT 53028** (previously BPBM 9435): 156.6 mm SL, 110-170 feet SW side of Augulpelu Reef, Palau Islands, 22 Apr. 1970, Randall, J. E., Emery, A. R. and Helfman, E. S., Rotenone.
ZUMT 57564: 51.6 mm SL, probably Philippines, Feb. 1988, purchased from Coral Fish Hawaii.

Centropyge nox (Bleeker, 1853) オハグロヤッコ

ZUMT 52794: 64.2 mm SL, Philippines, 11 Jan. 1971, Mr. Kennedy to Mr. Yamamoto.

Centropyge potteri (Jordan & Metz, 1912)

(流通名:ポッターズエンゼル・ポッターズピグミーエンゼル)

ZUMT 53029: 83.8 mm SL; **ZUMT 53030:** 82.7 mm SL; **ZUMT 53031:** 84.8 mm SL (previously BPBM 7948), Waikiki, Oahu Island, Hawaiian Islands, 25 feet depth, 30 May 1969, Randall, J.E., Neilm E. and Class, V.C.

Centropyge tibicen (Cuvier, 1831) アブラヤッコ

ZUMT 11041: 86.9 mm SL; **ZUMT 14614:** 79.0 mm SL, Philippines, between May 1925 and April 1926, U. Yamamura (山村樸次郎).

ZUMT 52515: 73.0 mm SL, Seragaki, Onna, Okinawa-jima Island, 14 Nov. 1967.

ZUMT 52538: 67.6 mm SL; **ZUMT 52539:** 74.4 mm SL, Nagannu Atoll, Keise-jima Island, off west of Okinawa-jima Island, 11 Nov. 1967.

ZUMT 52557: 68.4 mm SL, Okinawa Islands, purchased from Okinawa Kaigyoen, received on 14 Apr. 1970.

ZUMT 52567: 54.8 mm SL, between Kuro-shima, Kohama-jima, and Taketomi-jima islands, 24 Nov. 1967.

ZUMT 52724: 69.8 mm SL; **ZUMT 52725:** 67.7 mm SL; **ZUMT 52726:** 79.2 mm SL; **ZUMT 52730:** 59.2 mm SL, Okinawa-jima Island, purchased from tropical fish fisherman, 1968.

ZUMT 63353: 63.0 mm SL; **ZUMT 63354:** 61.4 mm SL, locality unknown.

Centropyge venusta (Yasuda & Tominaga, 1969) スミレヤッコ

ZUMT 52392: 78.4 mm SL, holotype, Izu-oshima Island (伊豆大島), Sagami Bay, Japan, 34°41'N, 139°27'E, about 10 m depth.

ZUMT 52423: 63.0 mm SL, Onna Beach, Okinawa-jima Island, 1 Jan. 1970, A. Taneisi.

Centropyge vrolikii (Bleeker, 1853) ナメラヤッコ

ZUMT 52528: 72.0 mm SL; **ZUMT 52536:** 89.7 mm SL, Nagannu Atoll, Keise-jima Island, off west of Okinawa-jima Island, 11 Nov. 1967.

ZUMT 52566: 81.9 mm SL; **ZUMT 52566:** 80.7 mm SL, between Kuro-shima, Kohama-jima, and Taketomi-jima islands, 24 Nov. 1967.

ZUMT 52727: 72.4 mm SL; **ZUMT 52727**: 70.3 mm SL; **ZUMT 52728**: 70.7 mm SL; **ZUMT 52728**: 65.2 mm SL; **ZUMT 52731**: 42.0 mm SL, Okinawa-jima Island, purchased from tropical fish fisherman, 1968.
ZUMT 52841: 66.7 mm SL, locality unknown.

Chaetodontoplus Bleeker, 1876 キンチャクダイ属
Chaetodontoplus caeruleopunctatus Yasuda & Tominaga, 1976 ホシゾラヤッコ

ZUMT 52825: 78.6 mm SL, holotype, Philippines, transported from Philippines to an aquarium fish dealer in Tokyo.

Chaetodontoplus chrysocephalus (Bleeker, 1855) アカネキンチャクダイ

ZUMT 52804: 118.1 mm SL, Izu Ocean Park, Ito, Shizuoka Pref., Sept. 1969, H. Masuda (益田 一).

ZUMT 53057: 80.2 mm SL, SEAFDEC RVC 62, Oct. 1972.

ZUMT 53965: 145.4 mm SL, Cape Shionomisaki (潮岬), Kushimoto (串本), Wakayama Pref., gill net, Jan. 1976.

ZUMT 55387: 166.8 mm SL, Kushimoto, Wakayama Pref., K. Mochizuki.

ZUMT 55388: 141.6 mm SL, Futo (富戸), Izu Ocean Park, Ito, Shizuoka Pref.

Chaetodontoplus melanosoma (Bleeker, 1853) キヘリキンチャクダイ

ZUMT 55389: 114.7 mm SL; **ZUMT 55390**: 121.3 mm SL, Philippines, transported from Philippines to Yamamoto Marine Aquarium Shop.

ZUMT 63324: 41.5 mm SL, locality unknown.

Chaetodontoplus mesoleucus (Bloch, 1787) チリメンヤッコ

ZUMT 11109: 100.8 mm SL; **ZUMT 42227**: 104.8 mm SL; **ZUMT 42228**: 112.7 mm SL; **ZUMT 42290**: 124.0 mm SL, Philippines, U. Yamamura.

ZUMT 52512: 87.2 mm SL, Seragaki, Onna, Okinawa-jima Island, 14 Nov. 1967.

ZUMT 52537: 74.0 mm SL, Nagannu Atoll, Keise-jima Island, off west of Okinawa-jima Island, 11 Nov. 1967.

ZUMT 52765: 42.5 mm SL, Izu Ocean Park, Ito, Shizuoka Pref., 1960's.

ZUMT 63416 (plastic tag MA-073): 102.8 mm SL, Kii Peninsula, 1970's, donation from Shirahama Aquarium, Kyoto University to M. Aizawa.

ZUMT 52782: 75.5 mm SL, locality unknown.

Chaetodontoplus septentrionalis (Temminck & Schlegel, 1844) キンチャクダイ

ZUMT 2146: 50.9 mm SL, holotype of *Holacanthus albofasciatus* Tanaka, 1909, Nagasaki Pref., T. Chiba.

Remarks: *Holacanthus albofasciatus* (Japanese name: Hakusen-kinchakudai ハクセンキンチャクダイ) is regarded as a junior synonym of *C. septentrionalis*.

ZUMT 2469: 2 specimens, 115.5 mm SL, 155.1 mm SL, Hamada (浜田), Shimane Pref., Sept. 1909, M. Tokuhisa (徳久三種), preserved in large tank.

ZUMT 10446: 132.0 mm SL, Goto Islands, Nagasaki Pref., 25 Mar. 1912, Y. Yamashita (山下幸平) at Saga Junior Highschool (佐賀中学校), preserved in large tank.

ZUMT 12308: 168.5 mm SL, Saiki (佐伯), Oita Pref., 20 Dec. 1914, K. Suito (出納国満), local name unknown, preserved in large tank.

ZUMT 19689: 58.4 mm SL, Keelung (基隆), Taiwan, H. Sato (佐藤春吉) (Taipei Keelung Junior High School) (台北基隆中学校), preserved in large tank.

ZUMT 22162: 145.3 mm SL, Nagasaki Pref., 1 Aug. 1909, I. Kaneko (金子一狼).

ZUMT 23231: 36.2 mm SL, Toyama Bay, identified on 16 Dec. 1930, K. Kikuchi (菊池勘左衛門) at Toyama High School (富山高等学校).

ZUMT 23736: 37.4 mm SL, Himi (氷見), Toyama Pref., 16 Oct. 1931, beach seining, M. Ota (太田外正) at Himi Toyama Prefectural Junior Highschool.

ZUMT 26051: 36.5 mm SL, Toyama Bay, recorded on 22 July 1933, K. Kikuchi at Toyama High School.

ZUMT 33646: 100.3 mm SL, Onoda, Yamaguchi Pref., 4 Oct. 1933, M. Nagatomi (永富三治).

Remarks: Mitsuharu Nagatomi was a botanist at Yamaguchi Pref.

ZUMT 38073: 34.0 mm SL, Takasu (鷹巣), Fukui Pref., 24 Sept. 1937, Fukui Prefecture Normal School (福井師範学校).

ZUMT 52736: 166.6 mm SL (preserved in large tank); **ZUMT 52751:** 174.4 mm SL (preserved in large tank); **ZUMT 52752:** 143.1 mm SL; **ZUMT 52753:** 165.9 mm SL (preserved in large tank); **ZUMT 52754:** 145.1 mm SL; **ZUMT 52757:** 134.7 mm SL; **ZUMT 52767:** 121.6 mm SL; **ZUMT 52768:** 36.8 mm SL, Izu Ocean Park, Ito, Shizuoka Pref., 1960's.

ZUMT 52786: 2 specimens, 25.3 mm SL, 29.6 mm SL, Jogasaki, Izu Peninsula, Shizuoka Pref., Nov. 1967.

ZUMT 52787: 20.6 mm SL, Jogasaki, Izu Peninsula, Shizuoka Pref., 27 Sept. 1967.

ZUMT 52788 (cloth tag 85): 40.7 mm SL, Jogasaki, Izu Peninsula, Shizuoka Pref., 2 Jan. 1968, H. Masuda.

ZUMT 52801: 28.0 mm SL, Jogasaki, Izu Peninsula, Shizuoka Pref., 5 Jan. 1968, T. Kawase.

ZUMT 53966: 24.6 mm SL, Cape Shionomisaki, Kushimoto, Wakayama Pref., Jan. 1976.

ZUMT 52799: 49.2 mm SL; **ZUMT 52837:** stained and dissected; **ZUMT 63356:** 154.1 mm SL; **ZUMT ABE 83-279:** 110.1 mm SL, locality unknown.

Genicanthus Swainson, 1839 タテジマヤッコ属
Genicanthus lamarck (Lacepède, 1802) タテジマヤッコ

ZUMT 14464: 132.7 mm SL; **ZUMT 14490:** 147.9 mm SL; **ZUMT 14491:** 139.9 mm SL, Ryukyu (琉球), probably Okinawa-jima Island (沖縄島), arrived on 24 Mar. 1925, S. Sakaguchi (坂口総一郎).

ZUMT 15368: 85.7 mm SL, Okinawa-jima Island, S. Sakaguchi at Okinawa Prefectural Daiichi Junior High School.

ZUMT 40390: 138.0 mm SL, Naha Market? (那覇市場?)

ZUMT 52561: 154.6 mm SL, donation from Keikyū Aburatsubo Marine Park, received on April 1973.

ZUMT 52759: 123.3 mm SL, Izu Ocean Park, Ito, Shizuoka Pref., 1960's.

ZUMT 52769: 100.3 mm SL; **ZUMT 52770:** 122.6 mm SL; **ZUMT 52771:** 105.4 mm SL; **ZUMT 52772:** 102.2 mm SL; **ZUMT 52773:** 116.4 mm SL; **ZUMT 52774:** 84.7 mm SL; **ZUMT 52775:** 93.9 mm SL, Toguchi (渡久地), Motobu (本部), Okinawa-jima Island, drive fishing, 22 Oct. 1970, Dr. Ida.

ZUMT 55378: 165.0 mm SL, male; **ZUMT 55379:** 123.3 mm SL, female, Onna, Okinawa-jima Island, 7–10 m depth, 28 June 1976, spear.

ZUMT 55380: 90.8 mm SL; **ZUMT 55381:** 99.4 mm SL; **ZUMT 55382:** 114.3 mm SL; **ZUMT 55383:** 122.0 mm SL, Hamasaki (浜崎)[near Sesoko-jima Island (瀬底島)], Motobu, Okinawa-jima Island, drive fishing, 26 Nov. 1975.

ZUMT 63352: 127.6 mm SL, locality unknown.

Genicanthus melanospilos (Bleeker, 1857) ヤイトヤッコ

ZUMT 15127: 94.0 mm SL, female, Okinawa-jima Island, from 1920 to 1930, S. Sakaguchi.

ZUMT 26736: 155.5 mm SL, male, Naze Port, Amami-oshima Island, received on 3 Feb. 1922, K. Enoya (榎屋兼武) (Oshima Junior High School, Kagoshima Prefecture) (鹿児島県立大島中学校).

ZUMT 52783: 148.3 mm SL, male, Kikai-jima Island (喜界島), 5 Nov. 1972.

ZUMT 52823: 134.4 mm SL, female; **ZUMT 52824:** 104.8 mm SL, male, Ishigaki-jima Island (石垣島),

ZUMT 55374: 125.8 mm SL, male; **ZUMT 55375:** 139.2 mm SL, male; **ZUMT 55376:** 134.4 mm SL, female; **ZUMT 55377:** 138.7 mm SL, female, Onna Beach, 7–10 m depth, 28 June 1976, spear.

ZUMT 55386: 116.4 mm SL, male, Kii Peninsula, Aug. 1965.

Genicanthus personatus Randall, 1975

ZUMT 53027: 91.3 mm SL, paratype, off Magic Island, Honolulu, Oahu Island, Hawaiian Islands, 80 feet depth.

Genicanthus semifasciatus (Kamohara, 1934) トサヤッコ

- ZUMT 19380**: 142.3 mm SL, male; **ZUMT 19381**: 131.2 mm SL, female, Hachijo-jima Island, Y. Oshitsu (押津義雄).
- ZUMT 52964**: 98.5 mm SL, female; **ZUMT 52965**: 111.2 mm SL, female; **ZUMT 52966**: 109.4 mm SL, female; **ZUMT 52967**: 91.8 mm SL, female, Koniya (古仁屋), Amami-oshima Island, Oct. 1970, F. Yasuda (安田富士郎) and Y. Tominaga.
- ZUMT 52422**: 128.5 mm SL, holotype of *Holacanthus fucosus* Yasuda and Tominaga, 1970, Sanbon-ne (about 34°05'N, 139°30'E), Miyake-jima, Japan, about 15 m depth.
- Remarks: *Holacanthus fucosus* (Japanese name: Kumadori-yakko クマドリヤッコ) is regarded as a junior synonym of *Genicanthus semifasciatus*.
- ZUMT 55384**: 134.0 mm SL, female, Hamasaki (near Sesoko-jima Island), Motobu, Okinawa-jima Island, drive fishing, 26 Nov. 1975.
- ZUMT 55385**: 113.6 mm SL, male, Kii Peninsula.

Genicanthus spinus Randall, 1975

- ZUMT 52987**: 193.8 mm SL, paratype, reef off Bounty Bay, Pitcairn Island, 33.5 m depth.

Genicanthus watanabei (Yasuda & Tominaga, 1970) ヒレナガヤッコ

- ZUMT 52420**: 105.6 mm SL, male, paratype; **ZUMT 52421**: 89.1 mm SL, female, holotype, Onna Beach, Okinawa-jima Island, Ryukyu Archipelago (26°30'N, 127°50'E), Dec. 1969.
- ZUMT 52796**: 92.7 mm SL, Motobu, Okinawa-jima Island, drive fishing, 21 May 1968.
- ZUMT 52797**: 84.4 mm SL, Motobu, Okinawa-jima Island, drive fishing, 4 July 1969.
- ZUMT 52969**: 102 mm SL; **ZUMT 52970**: 149.4 mm SL, Koniya, Amami-oshima Island, Oct. 1970, F. Yasuda and Y. Tominaga.

Holacanthus Lacepède, 1802

Holacanthus ciliaris (Linnaeus, 1758) (流通名:クイーンエンゼル)

- ZUMT 52776**: 184.6 mm SL; **ZUMT 52780**: 70.3 mm SL, Philippines, Oct. 1970, probably aquaculture, Mr. Yamamoto.

Holacanthus tricolor (Bloch, 1795) スリワケヤッコ

- ZUMT 52778**: 55.2 mm SL, Philippines, Oct. 1970, Mr. Yamamoto.
- ZUMT 52781**: 49.4 mm SL; **ZUMT 59675**: 72.1 mm SL, locality unknown.

Pomacanthus Lacepède 1802 サザナミヤッコ属
Pomacanthus annularis (Bloch, 1787) ワヌケヤッコ

ZUMT 52562: 118.8 mm SL, donated by Aburatsubo Marine Park (油壺水族館), received on Apr. 1970.

ZUMT 52835: 1326.2 mm SL, stained and dissected, locality unknown.

Pomacanthus arcuatus (Linnaeus 1758) (流通名:グレイエンゼルフィッシュ)

ZUMT 52806: 37.6 mm SL; **ZUMT 52822:** 61.2 mm SL, station190, S.W. Cove, Saint Andrews Islands, 10 Oct. 1965, Richards Ramsay, R/V *Geronimo*, Cruise 6.

ZUMT 52807: 78.6 mm SL, locality unknown.

ZUMT 52836: 105 mm SL, stained and dissected, Silver Bay (30°25'N, 80°25'W), Atlanta, U.S.A.

Pomacanthus imperator (Bloch, 1787) タテジマキンチャクダイ

ZUMT 19117: 168.3 mm SL, preserved in large tank, Mitsune Beach (三根沿岸), Hachijojima Island, 2 July 1929, . Otsuki (大槻洋四郎), collected by spear.

ZUMT 52508: 158.4 mm SL; **ZUMT 52509:** 202.1 mm SL; **ZUMT 52516:** 180.2 mm SL, preserved in large tank, Seragaki, Onna, Okinawa-jima Island, 14 Nov. 1967.

ZUMT 52534: 117.1 mm SL, Nagannu Atoll, Keise-jima Island, off west of Okinawa-jima Island, 11 Nov. 1967.

ZUMT 52785: 24.6 mm SL, Jogasaki, Izu Peninsula, Shizuoka Pref., 30 m depth, 20 Nov. 1967, Nakamura, K.

ZUMT 52826: 181.1 mm SL, stained and dissected, Okinawa-jima Island, purchased from tropical fish fisherman, 1968.

ZUMT 57506: 85.3 mm SL, isolated reef, off north London Resettlement Area, northeast side of Kiritimati (Christmas Island), Line Islands, 85 feet depth, 23 July 1987, Earle, J. L.

ZUMT 52715: 139.0 mm SL; **ZUMT 52790:** 30.0 mm SL; **ZUMT 63340:** 106.8 mm SL; **ZUMT 63341:** 136.0 mm SL; **ZUMT 63342:** 70.7 mm SL; **ZUMT 63343:** 55.3 mm SL, locality unknown.

Pomacanthus navarchus (Cuvier, 1831) イナズマヤッコ

ZUMT 52560: 179.1 mm SL, preserved in large tank, donated by Keikyū Aburatsubo Marine Park, received on Apr. 1970.

ZUMT 52779: 57.5 mm SL, Philippines, Oct. 1970, Mr. Yamamoto.

Pomacanthus paru (Bloch, 1787)

ZUMT 52560: 179.1 mm SL, Silver Bay (24°59'N, 80°??'W), Florida?, U.S.A., 23 May 1961.

Pomacanthus semicirculatus (Cuvier, 1831) サザナミヤッコ

Remarks: S. Tanaka described *Acanthochaetodon nigrolunatus* Tanaka, 1918 on the basis of the specimen purchased at Tokyo Market which collected from Izu area (ZUMT 8344). Although this species is estimated as a junior synonym of *Pomacanthus semicirculatus* from the original description (Tanaka 1918), specimen of this species collected from Tokyo Market, were not found from the collection.

ZUMT 11099: 134.7 mm SL, Philippines, between May 1925 and April 1926, U. Yamamura.

ZUMT 13925: 251.0 mm SL, preserved in large tank, Okinawa-jima Island, S. Sakaguchi.

ZUMT 18925: 56.0 mm SL, Kiragawa (吉良川), Aki (安芸), Kochi Pref., 27 Mar. 1929, T. Kamohara (蒲原稔治).

ZUMT 27651: 51.0 mm SL, Yaku-shima Island (屋久島), end of 1925.

ZUMT 52511: 167.1 mm SL, preserved in large tank, Seragaki, Onna, Okinawa-jima Island, 14 Nov. 1967.

ZUMT 52525: 29.1 mm SL; **ZUMT 52529:** 49.5 mm SL; **ZUMT 52540:** 77.0 mm SL; **ZUMT 52541:** 85.4 mm SL, Nagannu Atoll, Keise-jima Island, off west of Okinawa-jima Island, 11 Nov. 1967.

ZUMT 52723: 112.6 mm SL; **ZUMT 52831:** 88.6 mm SL, stained and dissected, Okinawa-jima Island, purchased from tropical fish fisherman, 1968.

ZUMT 52737: 162.2 mm SL; **ZUMT 52756:** 179.1 mm SL, preserved in large tank, Izu Ocean Park, Ito, Shizuoka Pref., 1960's.

ZUMT 52795: 16.4 mm SL, 24.4 mm SL, Jogasaki, Izu Peninsula, Shizuoka Pref., 8 Oct. 1967, Nakamura, K.

ZUMT ABE 3105: 40.5 mm SL, Palau, 1936–1937, T. Abe.

ZUMT 40416 (cloth tag 103): 72.0 mm SL; **ZUMT 46584:** 182.0 mm SL, preserved in large tank, locality unknown.

ZUMT 52805: 75.0 mm SL; **ZUMT 63322:** 32.5 mm SL; **ZUMT 63344:** 128.0 mm SL; **ZUMT 63345:** 103.1 mm SL; **ZUMT 63346:** 44.6 mm SL, locality unknown.

Pomacanthus sexstriatus (Cuvier, 1831) ロクセンヤッコ

ZUMT 11100: 103.6 mm SL, Philippines, between May 1925 and April 1926, U. Yamamura.

ZUMT 52565: 90.5 mm SL, middle of Kuro-shima, Kohama-jima, and Taketomi-jima islands, 24 Nov. 1967.

ZUMT 52758: 149.5 mm SL, Izu Ocean Park, Ito, Shizuoka Pref.

ZUMT ABE 3852: 239.4 mm SL; **ZUMT ABE 3853:** 205.8 mm SL; **ZUMT ABE 3854:** 297.7 mm SL, Palau, 1936–1937, T. Abe.

ZUMT 56546: 129.0 mm SL, locality unknown.

Pomacanthus xanthometopon (Bleeker, 1853) アデヤッコ

ZUMT 14621: 137.8 mm SL, Philippines.

ZUMT 52558: 124.8 mm SL, preserved in large tank, Okinawa Islands, purchased from Okinawa Kaigyoen, received on 14 Apr. 1970.

ZUMT 52559: 182.8 mm SL, preserved in large tank, donated by Aburatsubo Marine Park, received on Apr. 1970.

ZUMT 52777: 91.8 mm SL, Philippines, Oct. 1970, Mr. Yamamoto.

Pygoplites Fraser-Brunner, 1933 ニシキヤッコ属
Pygoplites diacanthus (Boddaert, 1772) ニシキヤッコ

ZUMT 14622: 129.1 mm SL, Philippines.

ZUMT 52518: 155.3 mm SL, Seragaki, Onna, Okinawa-jima Island, 14 Nov. 1967.

ZUMT 52532: 140.3 mm SL, Nagannu Atoll, Keise-jima Island, off west of Okinawa-jima Island, 11 Nov. 1967.

ZUMT 52722: 129.4 mm SL, Okinawa-jima Island, purchased from tropical fish fisherman, 1968.

ZUMT 52800: 35.5 mm SL, Jogasaki, Izu Peninsula, Shizuoka Pref., 4 Jan. 1968, Kawase, T.

ZUMT 63338 (MA-070): 89.4 mm SL, Kii Peninsula, 1970's, donation from Shirahama Aquarium, Kyoto University to M. Aizawa.

ZUMT 52714: 164.0 mm SL; **ZUMT 63351:** 156.4 mm SL, locality unknown.

Pomacanthidae gen sp.

ZUMT 53051, dissected, near Lubang Island, Philippines, Dec. 1973, donated or purchased by Yamamoto Marine Aquarium Shop.

ZUMT 52838, dissected, locality unknown.

ZUMT 63417: 71.6 mm SL; **ZUMT 63418:** 109 mm SL; **ZUMT 63419:** 126.5 mm SL, stained and dissected.

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References

- Allen, G. R., Steene, R. and Allen, M. 1998. A guide to angelfishes & butterflyfishes. Odyssey Publishing, U.S.A. and Tropical Reef Research, Perth.
- Koeda, K., Hata, H., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. History of the fish collection of the Department of Zoology, The University Museum, The University of Tokyo. The University Museum, The University of Tokyo Material Reports, 129: 1–24. (In Japanese)
- Senou, H. 2018. Pomacanthidae. Pp. 306–307. In: Nakabo, T. (ed) The Natural History of the Fishes of Japan. Shogakukan, Tokyo. (In Japanese)
- Shimada, K. 2013. Pomacanthidae. Pp. 1005–1015, 2025–2029. In: Nakabo, T. (ed) Fishes of Japan with pictorial keys to the species, third edition. Tokai University Press, Hadano. (In Japanese)
- Tanaka, S. 1918. Twelve new species of Japanese fishes. *Dobutsugaku Zasshi*, 30 (356): 223–227. (In Japanese)
- Wada, H., Takase, A. and Senou, H. 2022. First Japanese specimen-based record of *Centropyge abei* (Perciformes: Pomacanthidae) from the east coast of Izu Peninsula, central Japan. *Ichthy, Natural History of Fishes of Japan*, 17: 67–74.

A list of the specimens of Chimaeriformes (Holocephali) in the Department of Zoology, The University Museum, The University of Tokyo

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Abstract

A detailed investigation of the specimens of Chimaeriformes (Holocephali) deposited in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT) found 26 specimens including six egg capsule specimens. However, all of the following type specimens of Chimaeriformes cataloged in ZUMT, were not found: ZUMT 915, *Chimaera jordani* Tanaka, 1905; ZUMT 916 *Chimaera owstoni* Tanaka, 1905; ZUMT 961, *Chimaera spilota* Tanaka (1908); ZUMT 1457, *Chimaera mitsukurii* Dean, 1904a; ZUMT 2155, *Anteliochimaera chaetirhamphus* Tanaka, 1909; ZUMT 1453, *Rhinochimaera pacifica* (Mitsukuri, 1895). This report provides information on accessible specimens with some comments on the morphology of the egg capsules of Japanese chimaeras including the egg capsule specimens.

Introduction

Chimaeriformes “chimaeras” inhabit deep-sea waters worldwide, and three families, six genera and 57 species are regarded as valid (Weigmann 2016; Fricke et al. 2022). Especially, chimaeriformes are represented by 12 species across two families (Chimaeridae and Rhinochimaeridae) in the Japanese waters (Nakabo 2013a, b; Motomura 2020) and five of these species are endemic to Japan. Before the ZUMT collection started on 1904, Kakichi Mitsukuri described a new species *Rhinochimaera pacifica* (Mitsukuri, 1895) which was the first new fish species described by Japanese (Koeda et al. 2022). Secondly, Shigeo Tanaka (pupil of Mitsukuri) who built up the fish collection, started his ichthyological research on Chimaeriformes, and described two chimaeras, *Chimaera jordani* Tanaka, 1905 and *Chimaera owstoni* Tanaka, 1905 in the early history of ZUMT. Three years later, Tanaka described one more new species, *Chimaera spilota* Tanaka, 1908. However, the type specimens of these four species deposited in ZUMT, are presently regarded as “lost” (Fricke et al. 2022). Therefore, all specimens of chimaeras deposited in ZUMT were reidentified in this study, and listed below.

Materials and Methods

The specimens of Chimaeriformes in ZUMT were re-identified by the first author in the present study, generally following Dean (1904ab), Dider et al. (2012), Kokuho et al. (2003), and Nakabo et al. (2013a). Body length (BDL) and total length (TL) were measured for all specimens and egg capsules, respectively, following Dider et al. (2012) and Chembian (2007). Although some of the ZUMT specimens collected by Dr. Abe had not been formally cataloged into the ZUMT collection (and the data of some specimens not retained), such specimens which can recognize by having underbar with the number on the accompanying label, are listed herein with the number ZUMT ABE XXXX, due to the possibility of future discovery of Dr. Abe's remaining catalog books with collection data. Specimens with the same collection locality and date are listed together. Local and personal names are given in Japanese (in parentheses) for specimens thus treated in Japanese in the specimen ledger. The collection year and collector for some specimens was estimated by following Koeda et al. (2022). The list includes collection locality, ZUMT number with number of specimens in parentheses when two or more, size, collection date, collector or donator and affiliation, and remarks when available. Catalog numbers after ZUMT 62000 are newly given during this study.

Collection of Chimaeriformes in ZUMT

The following holotype specimens of Chimaeriformes should be deposited in ZUMT, but unfortunately all of them could not find during the present study: *C. jordani* ジョルダンギンザメ, ZUMT 915 (Tanaka 1905); *C. owstoni* シロブチギンザメ, ZUMT 916 (Tanaka 1905); *C. spilota* (regarded as junior synonym of *H. barbouri*) ココノホシギンザメ, ZUMT 961 (Tanaka 1908); *C. mitsukurii* アカギンザメ, ZUMT 1457 (Dean 1904a); *Anteliochimaera chaetirhamphus* アズマギンザメ, ZUMT 2155 (Tanaka, 1909); *R. pacifica* テングギンザメ, ZUMT 1453 (Mitsukuri 1895). For details on the type specimens, refer to Aizawa et al. (2022). Although Dean (1904a) showed egg capsule specimens of *C. phantasma*, *H. mitsukurii* and *R. pacifica* collected from Misaki, Kanagawa Prefecture were deposited in ZUMT, egg capsule specimens of *H. mitsukurii* were not found during the survey. Several notable specimens especially for egg capsules were found from the collection, e.g., ZUMT 1456 which is *C. phantasma* specimen immediately after description and some egg capsule specimens. Although egg capsules of Chimaeridae are rarely available, they are known to have morphological differences among species, which can contribute to species distributional records. Therefore, the egg capsule specimens in ZUMT should be a valuable resource for future taxonomic studies on chimaeras, and some comments on the morphology of the egg capsules of Japanese chimaeras are given in the remarks.

Chimaeridae ギンザメ科

Chimaera Linnaeus, 1758 ギンザメ属

Chimaera phantasma Jordan & Snyder, 1900 ギンザメ

ZUMT 1456: 270.4 mm BDL, male, Misaki, Miura City, Kanagawa Pref., June 1901, B. Dean.

ZUMT 20359: 227.9 mm BDL, female, Kii-Tanabe (currently Tanabe City), Wakayama Pref., before 1930, N. Ui (宇井縫蔵).

ZUMT 24105: 321.8 mm BDL, male, Naya (currently Nakamachi and Kinsei-cho), Kagoshima City, Kagoshima Pref.

ZUMT 44101: 383.7 mm BDL, male, Hachijo-jima Island, Feb. 1922, M. Uchiyama (内山操).

ZUMT 51079: 128.8 mm BDL, female, East China Sea, 2 Feb. 1960.

ZUMT 51380: 293.8 mm BDL, female; **ZUMT 51381:** 181.6 mm BDL, female; **ZUMT 51382:** 165.7 mm BDL, male; **ZUMT 51383:** 107.6 mm BDL, female, East China Sea, purchased at Fukuoka Fish Market, 12 Aug. 1959, Y. Tominaga (富永義昭).

ZUMT 53479: 95.1 mm BDL, male, Ishigaki-jima Island.

Remarks: This specimen represents the first record of *C. phantasma* from the Ishigaki-jima Island.

ZUMT 54900: 246.7 mm BDL, female, Sagami Bay, 1938, Mitsui Institute of Marine Biology (三井海洋生物研究所).

ZUMT 63371: 341.3 mm BDL, female; **ZUMT 63372:** 166.3 mm BDL, female, no data.

ZUMT 63377: 355.6 mm BDL, female, Nagasaki Pref., Apr. 1910, Nagasaki Prefecture Normal School (長崎師範学校).

Hydrolagus Gill, 1862 アカギンザメ属

Hydrolagus mitsukurii (Jordan & Snyder, 1904) アカギンザメ

ZUMT ABE 18209: 375.5 mm BDL, female, off Inubozaki Cape, Chiba Pref., 15 June 1978, T. Abe (阿部宗明).

Remarks: Tanaka (1913) shown the identification key of this species as a Japanese name “Mitsukuri-ginzame ミツクリギンザメ”.

Hydrolagus barbouri (Garman, 1908) コノホシギンザメ

ZUMT 25605: 115.9 mm BDL, female; **ZUMT 25606:** 143.6 mm BDL, male, off Onahama, Fukushima Pref., 400–500 m depth, before 1933, H. Tsunoda (角田春彦).

ZUMT 31680: 98.8 mm BDL, male, Ibaraki Pref., before 1936, K. Tashiro (田代清友).

ZUMT 63373: 180.1 mm BDL, male; **ZUMT 63374:** 199.0 mm BDL, male; **ZUMT 63375:** 182 mm BDL, no data.

-Egg capsules-

Chimaeridae ギンザメ科

Chimaera Linnaeus, 1758 ギンザメ属

Chimaera phantasma Jordan & Snyder, 1900 ギンザメ

ZUMT 37987 (2): 233.2 mm TL, 112.5+ mm TL, no data.

ZUMT 63401 (Fig.1): 232.4 mm TL, Tokyo Market, Tokyo Met.

ZUMT 63409 (2): 251.3 mm TL, 262.9 mm TL, probably Sagami Bay, 450 m depth, collected on 8 Mar. 1901, K. Aoki (青木熊吉).

Hydrolagus Gill, 1862 アカギンザメ属
Hydrolagus barbouri (Garman, 1908) ココノホシギンザメ

ZUMT 63402 (Fig. 2): 121.5 mm TL, Ishinomaki City, Miyagi Pref., Y. Wakiya (脇谷洋次郎).

Remarks: These specimens were identified as egg capsules of Chimaeridae based on the following characteristics: teardrop shape with small lateral flanges; dorsal surface with raised keel along the middle (Ebert and Dand 2020). The egg capsule of three Japanese chimaeras can be identified by the following characteristics: *C. phantasma* (n=4; Fig. 1): narrow end of egg capsule (tail sheath) extended (capsule width more than 12.6% total length), the apex of the larger end flat; *H. mitsukurii*: narrow end of egg capsule extended (capsule width 12.3% total length), the apex of the larger end constricted; *H. barbouri* (n=1; Kokuho et al. 2003, Fig. 2): narrow end of egg capsule shortened (capsule width 25.8% total length), the apex of the larger end flat (Dean 1904a).

Rhinochimaeridae テングギンザメ科
Rhinochimaera Garman, 1901 テングギンザメ属
Rhinochimaera pacifica (Mitsukuri, 1895) テングギンザメ

ZUMT 1498 (Fig. 3): 168.3 mm TL, Misaki, Miura City, Kanagawa Pref., 4 Mar. 1898, K. Aoki.

ZUMT 3212: 185.3 mm TL, probably Okinose, Tokyo Bay, 1050 m depth, Feb. 1908, K. Aoki.

ZUMT 63410 (2): 173.3 mm TL, 212.7 mm TL, off Atami City, Shizuoka Pref., Sagami Bay, 22 June 1906, A. Owston (deposited by K. Aoki).

Remarks: These specimens were identified as Rhinochimaeridae egg capsules based on the following characteristics: wide ribbed lateral flanges with central spindle; dorsal surface without raised keel (Fig.3) (Ebert and Dand 2020). In the Japanese waters, following four species of Rhinochimaeridae are recorded: *R. pacifica*; *Rhinochimaera africana* Compagno, Stehmann & Ebert, 1990 (クロテングギンザメ); *Harriotta raleighana* Goode & Bean, 1895 (ヨミノツカイ); *Harriotta chaetirhampha* (Tanaka, 1909) (アズマギンザメ) (Nakabo et al. 2013b; Nakayama 2020; Motomura 2020). Although Dean (1904b) reported egg capsules of *R. pacifica* on the basis of the specimens ranged 16.5 or 26 cm deposited in ZUMT, these specimens were not found during the present study. The three egg capsule specimens of Rhinochimaeridae deposited in ZUMT found in the present study are identified as *R. pacifica*, because the shapes of the egg capsules are similar to those of *R. pacifica* shown by Dean (1904b), and *R. pacifica* is only the species of *Rhinochimaera* has been recorded from southern Japan (vs. *R. africana* known south to Iwate Pref. in Pacific coast of Japanese waters) (Nakabo 2013b).

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References

- Aizawa, M., Koeda, K., Hata, H., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. Fish types deposited in the Department of Zoology, The University Museum, The University of Tokyo - Part 2: Myxiniiformes to Acipenseriformes. The University Museum, The University of Tokyo Material Reports, 129: 189–217.
- Chembian, A. J. 2007. New record of *Rhinochimaera atlantica* (Chimaeriformes: Rhinochimaeridae) spawning ground in the Gulf of Mannar along the south-east coast of India. Indian Journal of Fisheries, 54: 345–350.
- Dean, B. 1904a. Notes on *Chimaera*. Two Japanese species, *C. phantasma* Jordan and Snyder and *C. mitsukurii* n. s., and their egg cases. Journal of the College of Science, Imperial University of Tokyo, 19 (3): 1–9.
- Dean, B. 1904b. Notes on the Long-Snouted Chimaeroid of Japan, *Rhinochimaera (Harriotta) Pacifica* (Garman) Mitsukuri. Journal of the College of Science. Imperial University of Tokyo, 19 (4): 1–20, 2 pls.
- Didier, D. A., Kemper, J. M. and Ebert, D. A. 2012. Phylogeny, biology and classification of extant holocephalans. Pp. 97–122. In: Carrier, J. C., Musick, J. A., Heithaus, M. R. (eds) Biology of sharks and their relatives, 2nd edition. CRC Press, Boca Raton.
- Ebert, D. A. and Dando, M. 2020. Field guide to sharks, rays, and chimaeras of Europe and the Mediterranean. Princeton University Press, New Jersey. 383 pp.
- Fricke, R., Eschmeyer, W. N. and van der Laan, R. (eds). 2021. Eschmeyer's catalog of fishes: genera, species, references. Electronic version.
<https://researcharchive.calacademy.org/research/ichthyology/catalog/getref.asp?id=20773>.
Accessed 6 April 2022
- Koeda, K., Hata, H., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. History of the fish collection of the Department of Zoology, The University Museum, The University of Tokyo. The University Museum, The University of Tokyo Material Reports, 129: 1–24. (In Japanese)
- Kokuho, T., Nakaya, K. and Kitagawa, D. 2003. Distribution and reproductive biology of the Nine-spot Ratfish *Hydrolagus barbouri* (Holocephali; Chimaeridae). Memoirs of the Graduate School of Fisheries Science, Hokkaido University, 50 (2): 63–87.

- Tanaka, S. 1905. On two new species of *Chimaera*. Journal of the College Science Imperial University of Tokyo 20 (11): 1–14, pls. 1–2.
- Tanaka, S. 1908. Notes on some Japanese fishes, with descriptions of fourteen new species. Journal of the College of Science, Imperial University, Tokyo, 23 (7): 1–54, pls. 1–4.
- Tanaka, S. 1909. Descriptions of one new genus and ten new species of Japanese fishes. Journal of the College of Science. Imperial University of Tokyo, 27 (8): 1–27, pl. 1.
- Tanaka, S. 1913. Simple identificational keys to fishes, vol. 2. The Ichthyological Journal, 1 (6): 154–156.
- Mitsukuri, K. 1895. On a new genus of the chimaeroid group *Harriotta*. Zoological Magazine, 7 (80): 97–98, pl. 16. (In Japanese)
- Motomura, H. 2020. List of Japan's all fish species. Current standard Japanese and scientific names of all fish species recorded from Japanese waters. The Kagoshima University Museum, Kagoshima. 560 pp.
- Nakabo, T., Yagishita, N. and Yamaguchi, A. 2013a. Chimaeridae. Pp. 146–147, 1755. In: Nakabo T. (ed) Fishes of Japan with pictorial keys to the species, third edition. Tokai University Press, Hadano. (In Japanese)
- Nakabo, T., Yagishita, N. and Yamaguchi, A. 2013b. Rhinochimaeridae. Pp. 148–149, 1755. In: Nakabo T. (ed) Fishes of Japan with pictorial keys to the species, third edition. Tokai University Press, Hadano. (In Japanese)
- Nakayama, N., Matsunuma, M. and Endo, H. 2020. A preliminary review and in situ observations of the spookfish genus *Harriotta* (Holocephali: Rhinochimaeridae). Ichthyological Research, 67: 82–91.
- Weigmann, S. 2016. Annotated checklist of the living sharks, batoids and chimaeras (Chondrichthyes) of the world, with a focus on biogeographical diversity. Journal of Fish Biology, 88: 837–1037.



Figure 1. Egg capsule of *Chimaera phantasma*: ZUMT 63401, 232.4 mm TL, Tokyo Market, Tokyo Met.



Dorsal



Lateral

Figure 2. Egg capsule of *Hydrolagus barbouri*: ZUMT 63402, 121.5 mm TL, Ishinomaki City, Miyagi Pref., Y. Wakiya.



Figure 3. Egg capsule of *Rhinochimaera pacifica*: ZUMT 1498, 168.3 mm TL, Misaki, Miura City, Kanagawa Pref., 4 Mar. 1898, K. Aoki.

List of the specimens of family Sphyraenidae (Actinopterygii: Teleostei) deposited in the Department of Zoology, The University Museum, The University of Tokyo

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Abstract

A total of 224 specimens in 198 lots, representing 10 species of Sphyraenidae, are held in the Department of Zoology, The University Museum, The University of Tokyo. No types are known for the family in the collection. A list of specimens is provided, including all available data, with remarks on some species. An example of *Sphyraena arabiansis* represents the first record of that species from Malaysia.

Introduction

The barracudas included in the family Sphyraenidae are currently regarded as comprising single Recent and fossil genera (Ballen 2019), the family being diagnosed by two widely separated dorsal fins without finlets, a cylindrical body with a long pointed head, and canine-like teeth on both jaws and the palatines (Senou 2001, 2013). Included extant species are distributed world-wide in tropical and temperate seas (Ballen 2019), some being abundantly caught and commercially important (Senou 2001; Russell 2002, 2016; Chiang et al. 2014; Miki 2019b; Hata 2020). However, human consumption of some large-bodied sphyraenid species have been known to result in ciguatera poisoning (Hashimoto 1956; Geller et al. 1991; Matta et al. 1999; Noguchi 2004). Accordingly, *Sphyraena barracuda* (Edwards, 1771) is prohibited from being sold as food in Japan (Ministry of Health and Welfare 1953). Attacks on swimmers by large barracudas have also been reported (de Silva 1963; DeLuca 2014).

The phylogenetic position of Sphyraenidae has been fluid, the family having been included in the suborder Mugiloidei (Jordan and Hubbs 1919; Matsubara 1955; Gosline 1971), and more recently, Scombroidei (Senou 2001, 2013; Russell 2002, 2016). Although the phylogenetic position of Sphyraenidae has not yet been clarified, relationships with several families, including Lactariidae, Centropomidae, and Latidae, have been suggested (Mirande 2016; Rabosky et al. 2018; Girard et al. 2020).

During a survey of the fish collection deposited in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT), numerous specimens of the family collected from various areas were found, and are listed herein.

Materials and Methods

Sphyraenid specimens in the Department of Zoology, The University Museum, The University of Tokyo (abbreviated as ZUMT) were identified during the present study following Senou (2001, 2013), Doiuchi and Nakabo (2005), Morishita et al. (2020a, b) and Morishita and Motomura (2020). Data included in parentheses following registration numbers are as follows: specimen counts, standard length; collection locality; collection date; and collector. Collection data of specimens are omitted if the same as that for the following specimen. Remarks are also given where applicable. The collection year and collector for some specimens was estimated by following Koeda et al. (2022).

The ZUMT specimens listed herein were stored in Room 406 (specimen storage room) in the museum building. Most were stored in shelved containers, although some larger specimens were stored in a glass tank (labelled “Sphyraenidae”; glass lid sealed with a silicon adhesive) in the same room (as of Mar. 2022). Although some of the ZUMT specimens collected by Dr. Tokiharu Abe (most with collection data missing) had not been registered into the ZUMT collection, they are listed herein together with their ZUMT ABE number (underlined number written on specimen label), in the hope that Dr. Abe’s catalog books with collection data will be rediscovered in the future. Of the latter specimens, those labelled between ZUMT ABE 2700 to 6000 were collected from Palau by Dr. Abe between 1936 and 1937 (Koeda et al. 2022).

Results

A total of 198 lots comprising 224 specimens of 10 sphyraenid species were confirmed in the ZUMT fish collection. No types of nominal species were found. However, the distribution of *Sphyraena arabiansis* was newly confirmed based on a ZUMT specimen (see Remarks under that species), and the distributional patterns of some barracudas in Japan in the early 20th century were partially revealed.

Species accounts

Family Sphyraenidae カマス科

Sphyraena arabiansis Abdussamad & Retheesh, 2015 ヤシヤカマス

MALAYSIA

ZUMT 62660 (Fig. 1) [289.0 mm; probably Sarawak State; tagged as “P130”; donated in 1960 by Tom Harrisson (Sarawak Museum) to I. Tomiyama]

Remarks: *Sphyraena arabiansis* has been recorded only from Lakshadweep Islands (southeastern Arabian Sea), southern Japan, and New Caledonia (Abdussamad et al., 2015; Morishita et al. 2020b), the present specimen therefore representing the first record of the species from Malaysia.

Sphyraena barracuda (Edwards, 1771) オニカマス

JAPAN

SHIZUOKA PREF.

ZUMT 17758 (69.3 mm; Enoura, Numazu City; coll. by N. Kuroda)

OKINAWA PREF.

ZUMT 60286 (116.1 mm; estuary of Yonada River, Iriomote-jima Island, Ryukyu Archipelago; 20 Aug. 1989)

PHILIPPINES

ZUMT 14602 (157.5 mm; Philippines)

ZUMT 40988 (182.2 mm; Jolo Island; Feb. 1902; coll. by I. Iijima and K. Aoki)

ZUMT 42357 (269.4 mm; Basilan; 1926; coll. by U. Yamamura)

ZUMT 54648 (207.7 mm; Puerto Princesa, Palawan; 8 Feb. 1985; coll. by M. Aizawa)

PALAU

ZUMT ABE 2999 (379.4 mm), ZUMT ABE 3416 (172.6 mm), ZUMT ABE 3757 (301.0 mm), ZUMT ABE 3878 (321.0 mm; Palau)

Remarks: The Japanese collection site of the ZUMT specimen is shown in Fig. 2A.

Sphyraena forsteri Cuvier, 1829 オオメカマス

JAPAN

KAGOSHIMA PREF.

ZUMT 40728 (3 specimens, 75.7–85.8 mm; Amami-oshima Island, Amami Islands, Ryukyu Archipelago; coll. by K. Enokiya)

LOCALITY UNKNOWN

ZUMT 46390 (290.8 mm), ZUMT 46391 (284.5 mm; no data)

Remarks: The Japanese collection site of the ZUMT specimens is shown in Fig. 2A.

Sphyraena jello Cuvier, 1829 トラカマス

TAIWAN

ZUMT 14939 (233.1 mm), ZUMT 14940 (237.6 mm; Tainan; coll. by T. Aoki)

Sphyraena obtusata Cuvier, 1829 タイワンカマス

JAPAN

IZU ISLANDS

ZUMT ABE 62-118 (293.5 mm; off Ako, Miyake-jima Island, Izu Islands; 15 Oct. 1961; coll. by Y. Kurata)

KANAGAWA PREF.

ZUMT 48604 (277.4 mm; obtained at Misaki Market, Miura City; 21 Nov. 1955; coll. by I. Tomiyama)

RYUKYU ARCHIPELAGO

ZUMT 11265 (150.2 mm), ZUMT 15365 [144.2 mm; probably Okinawa-jima Island; coll. by S. Sakaguchi (Okinawa Prefectural Daiichi Junior High School)]

ZUMT 14283 (236.4 mm), ZUMT 14284 (229.0 mm), ZUMT 14285 (242.0 mm), ZUMT 14286 [236.2 mm; probably from Ryukyu Archipelago; 23 Jan. 1925; coll. by H. Yashiro (Naha Fish Market)]

ZUMT 14437 (239.0 mm), ZUMT 14466 (213.0 mm; Ryukyu Archipelago; coll. by S. Sakaguchi)

ZUMT 16917 (70.9 mm), ZUMT 20066 (70.3 mm; Onna Village, Okinawa Pref.; coll. by S. Sakaguchi)

ZUMT 16987 (129.4 mm), ZUMT 16989 (151.2 mm; Itoman City, Okinawa Pref.; coll. by S. Tanabe)

ZUMT 19081 (324.4 mm; probably collected from Okinawa Pref.; 18 May 1928; coll. by personnel of Okinawa Prefectural Experimental Center)

ZUMT 22765 (78.5 mm; Okinawa Pref.)

TAIWAN

ZUMT 13675 (96.4 mm; Keelung; coll. by T. Aoki)

ZUMT 62566 (145.5 mm; obtained at Ximending Market, Taipei City; 27 Mar. 1930)

PHILIPPINES

ZUMT 54649 (196.1 mm; Puerto Princesa, Palawan; 8 Feb. 1985; coll. by M. Aizawa)

PALAU

ZUMT 42740 (16 specimens, 86.6–162.7 mm; Palau; coll. by Y. Haneda)

ZUMT ABE 3825 (70.1 mm), ZUMT ABE 3827 (44.3 mm), ZUMT ABE 3828 (48.4 mm), ZUMT ABE 3829 (45.5 mm), ZUMT ABE 5911 (229.4 mm; Palau)

TANZANIA

ZUMT 52868 (149.6 mm; Kunduchi, Dar es Salaam)

LOCALITY UNKNOWN

ZUMT 46392 (268.3 mm), ZUMT 46393 (250.5 mm), ZUMT ABE 1746 (169.3 mm), ZUMT ABE 60-35 (182.5 mm; no data)

Remarks: Although *S. obtusata* is now abundantly caught off the Pacific coast of Japan from Wakayama Prefecture to Kyushu (Doiuchi 2001; Kagoshima City Aquarium Foundation 2008, 2018; Ikeda and Nakabo 2015; Hata et al. 2017; Hata 2018, 2020; Miki 2019a, 2021), ZUMT examples of the species from the above area are limited to single specimens collected from Sagami Bay and Miyake-jima Island in 1955 (ZUMT 48604) and 1961 (ZUMT ABE 62-118), respectively (Fig. 2B). This suggests that the frequent occurrence of *S. obtusata* in the area north of Kyushu is a recent phenomenon that began in the latter half of the 20th century. Additionally, *S. obtusata* is abundantly caught in Okinawa Prefecture (Yoshino 1984a; Taguchi 1989; Motonaga 1991; Miura 2012). The abundance of many specimens from the Ryukyu Archipelago in the ZUMT collection suggests that the species has been abundant in that region since the early 20th century.

Sphyræna pinguis Günther, 1874 アカカマス

JAPAN

HOKKAIDO

ZUMT 8255 (68.6 mm; Takashima, Otaru City; Sept. 1909; coll. by personnel of Hokkaido Prefectural Fisheries Experimental Station)

AOMORI PREF.

ZUMT 13242 (147.7 mm), ZUMT 13243 (166.0 mm; Hamasuka, Hachinohe City; 26 Oct. 1923; coll. by S. Tanabe)

ZUMT 34030 [162.0 mm; probably collected from Aomori Pref.; donated by S. Wada (Aomori Normal School)]

IBARAKI PREF.

ZUMT 14395 (204.3 mm; Kuji, Hitachi City)

CHIBA PREF.

ZUMT 27561 (73.0 mm), ZUMT 29419 (66.4 mm), ZUMT 29420 (77.5 mm), ZUMT 29423 (73.4 mm; Chiba Pref.)

TOKYO MARKET

ZUMT 4121 (182.7 mm), ZUMT 4122 (166.8 mm; obtained at Tokyo Market, Tokyo Met.)

KANAGAWA PREF.

ZUMT 3558 (174.9 mm), ZUMT 3559 (196.2 mm; Misaki, Miura City; 20 Sept. 1913; coll. by K. Aoki)

ZUMT 21281 (149.1 mm; Kanagawa Pref.; 20 Sept. 1925)

ZUMT 27402 (63.2 mm; Koajiro, Aburatsubo, Misaki, Miura City; 27 July 1904)

ZUMT 48605 (241.9 mm; obtained at Misaki Market, Miura City; 21 Nov. 1955)

ZUMT 55649 (278.0 mm; Misaki Market, Miura City, Kanagawa Pref.; 29 July 1986)

SHIZUOKA PREF.

ZUMT 18568 (124.1 mm; Hamana Lake; coll. by S. Oe)

ZUMT 43335 (57.4 mm; Shizuura, Numazu City)

HIROSHIMA PREF.

ZUMT 25289 (198.0 mm; obtained at Hiroshima Market; 4 Nov. 1932; coll. by M. Katayama)

YAMAGUCHI PREF.

ZUMT 33644 [89.1 mm; probably collected from Seto Inland Sea in Yamaguchi Pref.; donated by M. Eitomi (San-yo-onoda City)]

TOYAMA PREF.

ZUMT 32305 (44.6 mm), ZUMT 32306 (52.7 mm; Toyama Bay, Toyama Pref.; 28 Aug. 1935)

ZUMT 41219 (193.0 mm), ZUMT 41258 (197.5 mm), ZUMT 41259 (182.5 mm), ZUMT 41341 (168.0 mm; Uozu or Namerikawa City; coll. by I. Tomiyama)

ISHIKAWA PREF.

ZUMT 34180 (80.0 mm), ZUMT 34181 (83.8 mm; Shoin, Suzu City)

KYOTO PREF.

ZUMT 24330 (259.4 mm; Miyazu City; coll. by Kyoto Prefectural Training Center)

SHIMANE PREF.

ZUMT 31183 (103.3 mm; Matsue City)

ZUMT 31472 [282.2 mm; probably collected from Shimane Pref.; donated by R. Yanai (Matsue High School)]

EHIME PREF.

ZUMT 24975 (205.0 mm; Horie, Matsuyama City; Oct. 1931; coll. by S. Ishikawa)

FUKUOKA PREF.

ZUMT 35783 (155.8 mm), ZUMT 35784 (116.9 mm; Ariake Sea, off Okinohata, Yanagawa City; Oct. 1931; coll. by I. Tomiyama)

NAGASAKI PREF.

ZUMT 50071 [191.9 mm; Tamanoura, Goto City (Fukue-jima Island, Goto Islands); 14 Oct. 1953; coll. by I. Tomiyama]

ZUMT 50161 (198.0 mm), ZUMT 50162 (203.9 mm), ZUMT 50163 [178.3 mm; Arikawa, Shinkamigoto Town (Nakadori-jima Island, Goto Islands); 18 Oct. 1953; coll. by I. Tomiyama]

KAGOSHIMA PREF.

ZUMT 31628 (190.0 mm; Kagoshima Pref.)

CHINA

ZUMT 54507 (264.7 mm), ZUMT 54508 (252.5 mm), ZUMT 54509 (267.5 mm), ZUMT 54510 [262.3 mm; East China Sea, northeast of Shanghai (32°15'N, 122°40'E), 25 m depth; 11 Oct. 1984; coll. by FV *8th Ten-yo-maru*]

LOCALITY UNKNOWN

ZUMT 26741 (100.8 mm), ZUMT 46455 (158.5 mm), ZUMT 46876 (189.4 mm), ZUMT 46891 (184.3 mm), ZUMT 63314 (71.2 mm), ZUMT 63387 (173.3 mm), ZUMT 63388 (138.7 mm), ZUMT 63389 (153.7 mm), ZUMT 63390 (173.7 mm), ZUMT 63391 (145.2 mm), ZUMT 63392 (164.3 mm), ZUMT 63396 (152.2 mm), ZUMT 63397 (173.7 mm), ZUMT 63398 (145.5 mm), ZUMT 63399 (155.0 mm), ZUMT ABE 1920 (198.2 mm), ZUMT ABE 2669 (169.5 mm; no data)

Remarks: Although *S. pinguis* had been previously believed to be endemic to the northwestern Pacific (not distributed in the Ryukyu Archipelago) (Senou 1997a, 2002), Doiuchi and Nakabo (2005, 2007) showed that the species was widely distributed in the Indo-West Pacific; that a species previously treated as “Daruma-kamasu” (Yoshino 1984b; Senou 1997b, 2002) from the Ryukyu Archipelago was also identifiable as *S. pinguis*. Although examples of *S. pinguis* collected from Hokkaido to Kyushu were observed in the ZUMT collection, none from the Ryukyu Archipelago were found (Fig. 2B).

***Sphyraena putnamae* Jordan & Seale, 1905 オオカマス**

PHILIPPINES

ZUMT 12679 (323.7 mm; Philippines; coll. by U. Yamamura)

PALAU

ZUMT ABE 2759 (490.0 mm), ZUMT ABE 3826 (73.0 mm; Palau)

***Sphyraena genie* Klunzinger, 1870 タツカマス**

PHILIPPINES

ZUMT 42375 (360.3 mm; Basilan; 1926; coll. by U. Yamamura)

MALAYSIA

ZUMT 62661 (211.9 mm, probably Sarawak State; tagged as “P2368”)

ZUMT 62662 (222.3 mm; probably Sarawak State; tagged as “P1508”)

***Sphyraena stellata* Morishita & Motomura, 2020 ホソカマス**

JAPAN

OGASAWARA ISLANDS

ZUMT 63381 (363.9 mm), ZUMT 63382 (366.7 mm), ZUMT 63383 (373.6 mm; Ogasawara Islands; Mar. 1913; coll. by S. Fujimori)

KANAGAWA PREF.

ZUMT 48603 (319.8 mm; obtained at Misaki Fish Market, Miura City; 21 Nov. 1955; coll. by I. Tomiyama)

OKINAWA PREF.

ZUMT 11167 (166.4 mm), ZUMT 11168 [165.1 mm; probably Okinawa-jima Island, Ryukyu Archipelago; coll. by S. Sakaguchi (Okinawa Prefectural Daiichi Junior High School)]

ZUMT 16753 (228.6 mm), ZUMT 16754 (224.4 mm), ZUMT 16899 (190.2 mm), ZUMT 16900 (180.5 mm), ZUMT 16901 (178.0 mm), ZUMT 16904 (193.3 mm; Onna Village, Okinawa-jima Island; coll. by S. Tanabe)

ZUMT 16988 (141.6 mm; Itoman City, Okinawa-jima Island; coll. by S. Tanabe)

LOCALITY UNKNOWN

ZUMT 46527 (158.3 mm; no data)

Remarks: The Japanese collection sites of the ZUMT specimens are shown in Fig. 2A.

Sphyraena sp. ヤマトカマス

JAPAN**HOKKAIDO**

ZUMT 11328 (157.3 mm; Mombetsu, Date City; Oct. 1919; coll. by M. Tsuda)

CHIBA PREF.

ZUMT 2817 (130.3 mm) ZUMT 11816 (130.7 mm; Takanoshima, Tateyama City)
ZUMT 29418 (92.4 mm), ZUMT 29421 (82.3 mm), ZUMT 29422 (73.2 mm), ZUMT 29424
(79.4 mm), ZUMT 29425 (81.0 mm; Chiba Pref.)
ZUMT 33433 (148.8 mm), ZUMT 33436 (61.9 mm; Katsuura City)

TOKYO MARKET

ZUMT 21040 (89.8 mm; obtained at Tokyo Market)
ZUMT 63405 (194.0 mm) ZUMT 63406 (194.0 mm), ZUMT 63407 (199.9 mm), ZUMT
63408 (197.6 mm; probably obtained at Tokyo Fish Market)

IZU ISLANDS

ZUMT 62995 (5 specimens, 127.7–140.5 mm; Motomachi, Izu-oshima Island; 27 July 1991)

KANAGAWA PREF.

ZUMT 3560 (200.2 mm), ZUMT 3562 (195.7 mm), ZUMT 3563 (172.0 mm), ZUMT 4185
(127.7 mm; Misaki, Miura City; 20 Sept. 1913; coll. by K. Aoki)
ZUMT 20848 (160.4 mm), ZUMT 20867 (166.4 mm; Misaki, Miura City)
ZUMT 21255 (169.6 mm; Kanagawa Pref.; 20 Sept. 1925; coll. by personnel of Kamakura
Normal School)
ZUMT 26726 (51.2 mm; Aburatsubo, Misaki, Miura City; Oct. 1903)
ZUMT 27397 (87.8 mm), ZUMT 27400 (88.6 mm), ZUMT 27401 (92.8 mm; Koajiro, Misaki,
Miura City; 27 July 1904; coll. by S. Tanaka)

SHIZUOKA PREF.

ZUMT 3247 (251.8 mm; Hamana Lake; coll. by T. Aoki)
ZUMT 16272 (75.7 mm), ZUMT 16273 (70.1 mm), ZUMT 16274 [74.1 mm; probably
collected from Shizuoka Pref.; coll. by T. Yoneyama (Shizuoka Prefectural
Izushimodaminami Girls' High School)]
ZUMT 33354 (84.3 mm), ZUMT 33355 (96.8 mm; Shizuoka Pref.)

MIE PREF.

ZUMT 23128 (115.0 mm; Kada Bay, Owase City; 1 Aug. 1922; coll. by Y. Tsuchiga)
ZUMT 23129 (72.8 mm), ZUMT 23130 (72.1 mm), ZUMT 23131 (78.0 mm; Kimoto,
Kumano City; 4 May 1929; coll. by Y. Tsuchiga)

WAKAYAMA PREF.

ZUMT 21985 (149.3 mm; Wakayama Pref.; Jan. 1920)

HYOGO PREF.

ZUMT 2223 (84.0 mm; Fukura, Awaji City, Awaji-shima Island; coll. by R. Uchiyama)

SHIMANE PREF.

ZUMT 31173 (190.0 mm), ZUMT 31271 (202.0 mm; Matsue City)

EHIME PREF.

ZUMT 7146 (135.5 mm; pearl farm in Uchiumi, Ainan Town; 3 July 1916; coll. by K. Otsuki)

KOCHI PREF.

ZUMT 34601 (66.1 mm), ZUMT 34602 (64.5 mm; Kochi Pref.)

FUKUOKA FISH MARKET

ZUMT 51843 (122.8 mm), ZUMT 51844 (116.1 mm), ZUMT 51845 (115.2 mm), ZUMT 51846 (114.6 mm), ZUMT 51847 (107.0 mm; obtained at Fukuoka Fish Market, Fukuoka Pref.; 1959)

NAGASAKI PREF.

ZUMT 2296 (124.1 mm; Nagasaki Pref.; 27 June 1909)

ZUMT 27103 (62.3 mm), ZUMT 43314 (45.4 mm), ZUMT 44483 (6 specimens, 47.1–51.7 mm; Nagasaki Pref.)

ZUMT 47868 [240.0 mm; Tamanoura, Goto City (Fukue-jima Island, Goto Islands); 23 May 1953; coll. by I. Tomiyama]

ZUMT 48124 (244.1 mm), ZUMT 48125 [237.6 mm; Fukue Fish Market, Fukue, Goto City (Fukue-jima Island, Goto Islands); May 1953; coll. by I. Tomiyama]

ZUMT 50030 [256.4 mm; Miiraku, Goto City (Fukue-jima Island, Goto Islands); 13 Oct. 1953; coll. by I. Tomiyama]

ZUMT 50164 [197.8 mm; Arikawa, Shinkamigoto Town (Nakadori-jima Island, Goto Islands); 17 Oct. 1953; coll. by I. Tomiyama]

KAGOSHIMA PREF.

ZUMT 23747 (208.8 mm; Taniyama, Kagoshima City; 20 July 1930)

TAIWAN

ZUMT 13674 (162.5 mm; Keelung; coll. by T. Aoki)

LOCALITY UNKNOWN

ZUMT 63400 (186.2 mm), ZUMT ABE 2262 (80.3 mm), ZUMT ABE 2371 (93.4 mm), ZUMT ABE 2411 (108.7 mm), ZUMT ABE 2412 (84.5 mm), ZUMT ABE 2413 (103.1 mm), ZUMT ABE 2414 (83.6 mm), ZUMT ABE 2668 (190.0 mm), ZUMT ABE 60-36 (56.6 mm; no data)

Remarks: Although the applied name for the species treated as “ヤマトカマス” is frequently regarded as *Sphyraena japonica* Bloch & Schneider, 1801 (e.g., Senou 2013; Chiang et al. 2014; Jeong 2017; Hata 2018; Miki 2019b), it is treated as *Sphyraena* sp. herein, due to its questionable taxonomic status (Motomura 2020). Specimens in ZUMT represented a broad distribution in Japanese waters, from Hokkaido to Kyushu (Fig. 2C).

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References

- Abdussamad, E. M., Rethesh, T. B., Thangaraja, R., Bineesh, K. K. and Prakasan, D. 2015. *Sphyraena arabiansis* a new species of barracuda (family: Sphyraenidae) from the south-west coast of India. *Indian Journal of Fisheries*, 62 (2): 1–6.
- Ballen, G. A. 2019. Nomenclature of the Sphyraenidae (Teleostei: Carangaria): a synopsis of fossil- and extant-based classification systems. *Zootaxa*, 4686 (3): 397–408.
- Chiang, W.-C., Lin, P.-L., Chen, W.-Y. and Liu, D.-C. 2014. Marine fishes in eastern Taiwan. Fisheries Research Institute, Council of Agriculture, Keelung. vii + 331 pp. (In Chinese)
- DeLuca, L. P. 2014. Warning! Barracudas may bite: third circuit puts “teeth” in the FTCA’s discretionary function exception analysis. 58: 773–796.
- de Silva, D. P. 1963. Systematics and life history of the Great Barracuda *Sphyraena barracuda* (Walbaum). University of Miami Press, Miami. viii + 179 pp.
- Doiuchi, R. 2001. *Sphyraena flavicauda* Rüppell. P. 255. In: Nakabo, T., Machida, Y., Yamaoka, K. and Doiuchi, R. (eds) *Iburi, Fishes of Kuroshio*. Osaka Kaiyukan, Osaka. (In Japanese)
- Doiuchi, R. and Nakabo, T. 2005. The *Sphyraena obtusata* group (Perciformes: Sphyraenidae) with a description of a new species from southern Japan. *Ichthyological Research*, 52 (2): 132–151.
- Doiuchi, R. and Nakabo, T. 2007. Molecular evidence for the taxonomic status of three species of the *Sphyraena obtusata* group (Perciformes: Sphyraenidae) from East Asia. *Ichthyological Research*, 54 (3): 313–316.
- Geller, R. J., Olson, K. R. and Sénécal, P. E. 1991. Ciguatera fish poisoning in San Francisco, California, caused by imported barracuda. *The Western Journal of Medicine*, 155 (6): 639–642.
- Girard, M. G., Davis, M. P. and Smith, W. L. 2020. The phylogeny of carangiform fishes: morphological and genomic investigations of a new fish clade. *Copeia*, 108 (2): 265–298.
- Gosline, W. A. 1971. Functional morphology and classification of teleostean fishes. University of Hawaii Press, Honolulu. 208 pp.
- Hashimoto, Y. 1956. A note on the poison of a barracuda, *Sphyraena picuda* Bloch & Schneider. *Bulletin of the Japanese Society of Scientific Fisheries*, 21 (11): 1153–1157.
- Hata, H. 2018. Sphyraenidae. Pp. 418–422. In: Koeda, K., Hata, H., Yamada, M. and Motomura, H. (eds) *Field guide to fishes landed at Uchinoura Fishing Port, Kagoshima, Japan*. The Kagoshima University Museum, Kagoshima. (In Japanese)

- Hata, H. 2020. Sphyraenidae. Pp. 492–502. In: Koeda, K., Hata, H., Yamada, M. and Motomura, H. (eds) Fishes from markets in Osumi Peninsula, Kagoshima, Japan. The Kagoshima University Museum, Kagoshima. (In Japanese)
- Hata, H., Iwatsubo, H., Yamada, M., Maekawa, T. and Motomura, H. 2017. First records of *Sphyraena iburiensis* (Perciformes: Sphyraenidae) from the Amami Islands and southern Kyushu, Japan. *Biogeography*, 19: 10–16.
- Ikeda, H. and Nakabo, T. 2015. Fishes of the Pacific coasts of southern Japan. Tokai University Press, Hadano, 597 pp. (In Japanese)
- Jeong, B. 2017. Sphyraenidae. Pp. 257–259. In: Iwatsubo, H. and Motoura, H. (eds) Field guide to fishes of Kagoshima Bay in southern Kyushu, Japan. Kagoshima Museum of Aquatic Biodiversity, Kagoshima and the Kagoshima University Museum, Kagoshima. (In Japanese)
- Jordan, D. S. and Hubbs, C. L. 1909. Studies in Ichthyology. A monographic review of the family of Atherinidae or silversides. Leland Stanford Junior University Publications University Series. 87 pp., 12 pls.
- Kagoshima City Aquarium Foundation. 2008. Fishes collected with set net confirmed by Kagoshima city aquarium in Kagoshima. Kagoshima City Aquarium Foundation, Kagoshima, 224 pp. (In Japanese)
- Kagoshima City Aquarium Foundation. 2018. Fishes collected with set nets in Kagoshima and confirmed by Kagoshima City Aquarium. Second edition. Kagoshima City Aquarium Foundation, Kagoshima, 335 pp. (In Japanese)
- Koeda, K., Hata, H., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. History of the fish collection of the Department of Zoology, The University Museum, The University of Tokyo. The University Museum, The University of Tokyo Material Reports, 129: 1–24. (In Japanese)
- Matta, J., Milad, M., Manger, R. and Tosteson, T. 1999. Heavy metals, lipid peroxidation, and ciguatera toxicity in the liver of the Caribbean barracuda (*Sphyraena barracuda*). *Biological Trace Element Research*, 70: 69–79.
- Matsubara, K. 1955. Fish Morphology and Hierarchy. Parts I–III. Ishizaki Shoten, Tokyo. xi + 1605pp., 135 pls. (In Japanese)
- Miki, R. 2019a. Sphyraenidae. Pp. 176–181. In: Murase, A., Miki, R., Wada, M. and Senou, H. (eds) Coastal and market fishes around Kadogawa Bay, northern part of Miyazaki Prefecture, southern Japan. Nobeoka Marine Science Station, Field Science Center, University of Miyazaki, Nobeoka. (In Japanese)
- Miki, R. 2019b. Sphyraenidae. Pp. 1151–1155. In: Koeda, K. and Ho, H.-C. (eds) Fishes of southern Taiwan. National Museum of Marine Biology & Aquarium, Pingtung, Taiwan.
- Miki, R. 2021. Sphyraenidae. Pp. 224–229. In: Murase, A., Ogata, Y., Yamasaki, Y., Miki, R., Wada, M. and Senou, H. (eds) Coastal, shelf and deep-sea fishes around Kadogawa Bay, northern part of Miyazaki Prefecture, southern Japan. Nobeoka Marine Science Station, Field Science Center, University of Miyazaki, Nobeoka. (In Japanese)
- Ministry of Health and Welfare, 1953. About “poisonous barracuda”. *Eikanhatsu*, 20: 21. (In Japanese)

- Mirande, J. M. 2016. Combined phylogeny of ray-finned fishes (Actinopterygii) and the use of morphological characters in large-scale analyses. *Cladistics*, 33: 333–350.
- Miura, N. 2012. Fishes at Chinen Market, Okinawa. Wave Kikaku, Yonabaru. 140 pp. (In Japanese)
- Morishita, S., Miki, R., Wada, H., Itou, M. and Motomura, H. 2020a. Morphological comparisons of *Sphyraena qenie* with *S. putnamae*, with a revised key to Indo-Pacific species of *Sphyraena* lacking gill rakers (Sphyraenidae). *Ichthyological Research*, 67: 456–463. Doi: 10.1007/s10228-020-00738-6
- Morishita, S., Miki, R., Senou, H. and Motomura, H. 2020b. First Pacific records of *Sphyraena arabiansis* (Perciformes: Sphyraenidae), with a revised species diagnosis and morphological comparisons with *S. barracuda*. *Japanese Journal of Ichthyology*, 67(1): 73–83. Doi: 10.11369/jji.19-051 (In Japanese)
- Morishita, S. and Motomura, H. 2020. *Sphyraena stellata*, a new barracuda from the Indo-Pacific, with redescrptions of *S. helleri* Jenkins, 1901 and *S. novaehollandiae* Günther, 1860 (Perciformes: Sphyraenidae). *Zootaxa*, 4772 (3): 545–566. DOI: 10.11646/zootaxa.4772.3.6
- Motomura, H. 2020. List of Japan's all fish species. Current standard Japanese and scientific names of all fish species recorded from Japanese waters. The Kagoshima University Museum, Kagoshima. 560 pp. (In Japanese)
- Motonaga, F. 1991. Set net fishing resources surveys in Okinawa-jima Island. Pp. 94–102. In: Okinawa Prefectural Fisheries Experimental Station (ed), 1989 Okinawa Prefectural Fisheries Experimental Station Report. Okinawa Prefectural Fisheries Experimental Station, Naha. (In Japanese)
- Noguchi, T. 2004. Food poisoning due to marine toxin different from before. *Frozen Foods Technical Research*, 62: 1–10. (In Japanese)
- Rabosky, D. L., Chang, J., Title, P. O., Cowman, P. F., Sallan, L., Friedman, M., Kaschner, K., Garilao, C., Near, T. J., Coll, M. and Alfaro, M. E. 2018. An inverse latitudinal gradient in speciation rate for marine fishes. *Nature*, 559: 392–395.
- Russell, B. C. 2002. Sphyraenidae, barracudas. Pp. 1807–1811. In: Carpenter, K. E. (ed), *FAO species identification guide for fishery purposes and American Society of Ichthyologists and Herpetologists Special Publication no. 5. The living marine resources of the western central Atlantic. Vol. 3. Bony fishes part 2 (Opisthognathidae to Molidae), sea turtles and marine mammals*. FAO, Rome.
- Russell, B. C. 2016. Sphyraenidae, barracudas. Pp. 2865–2872 In: Carpenter, K. E. and De Angelis, N. (eds) *FAO species identification guide for fishery purposes. The living marine resources of the eastern central Atlantic. Vol. 4. Bony fishes part 2 (Perciformes to Tetraodontiformes)*. FAO, Rome.
- Senou, H. 1997a. *Sphyraena pinguis*. P. 654. In: Okamura, O. and Amaoka, K. (eds) *Sea fishes of Japan*. Yama-kei Publishers, Tokyo. (In Japanese)
- Senou, H. 1997b. *Sphyraena obtusata*. P. 655. In: Okamura, O. and Amaoka, K. (eds) *Sea fishes of Japan*. Yama-kei Publishers, Tokyo. (In Japanese)
- Senou, H. 2001. Sphyraeniadae, barracudas. Pp. 3685–3697. In: Carpenter, K. E. and Niem, V. H. (eds) *FAO species identification guide for fishery purposes. The living marine resources of the western central Pacific, vol. 6, no. 4*. FAO, Rome.

- Senou, H. 2002. Sphyraenidae, barracudas. Pp. 1334–1337, 1623–1624. In: Nakabo, T. (ed) Fishes of Japan with pictorial keys to the species, English edition. Tokai University, Press, Tokyo.
- Senou, H. 2013. Sphyraenidae, barracudas. Pp. 1636–1639, 2219–2221. In: Nakabo, T. (ed) Fishes of Japan with pictorial keys to the species third edition. Tokai University, Press, Hadano. (In Japanese)
- Taguchi, T. 1989. Field guide vol. 2, sea fishes of Japan. Shogakukan, Tokyo. 259 pp. (In Japanese)
- Yoshino, T. 1984a. *Sphyraena flavicauda* Rüppell. P. 118, pl. 106-E. In: Masuda, H., Amaoka, K., Araga, C., Uyeno, T., and Yoshino, T. (eds) The fishes of the Japanese Archipelago. Tokai University Press, Tokyo. (In Japanese)
- Yoshino, T. 1984b. *Sphyraena obtusata* Cuvier. P. 118, pl. 106-F. In: Masuda, H., Amaoka, K., Araga, C., Uyeno, T., and Yoshino, T. (eds) The fishes of the Japanese Archipelago. Tokai University Press, Tokyo. (In Japanese)



Figure 1. Preserved specimen of *Sphyraena arabiansis*, ZUMT 62660, 289.0 mm, probably Sarawak State.

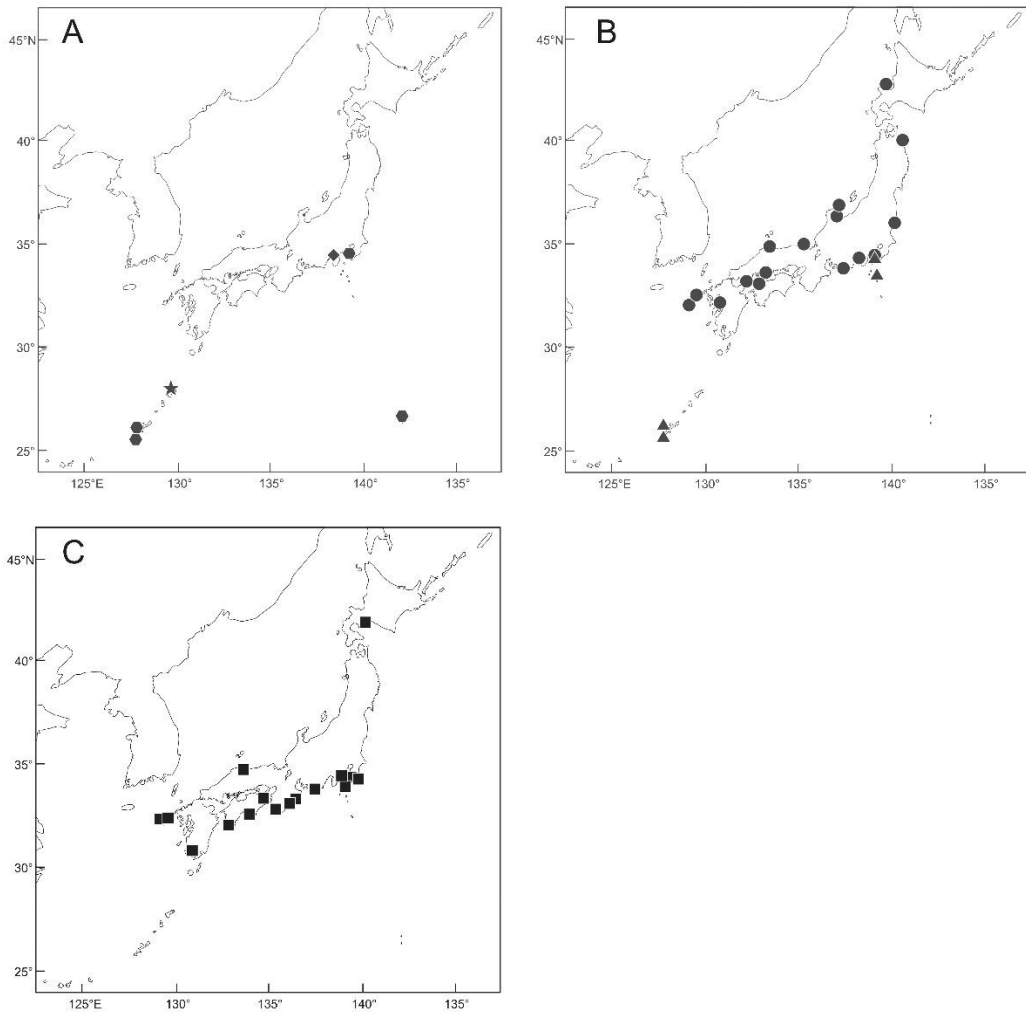


Figure 2. Japanese collection localities of specimens of (A) *Sphyraena barracuda* (diamond), *S. forsteri* (star), and *S. stellata* (hexagons), (B) *Sphyraena obtusata* (triangles) and *S. pinguis* (circles), and (C) *Sphyraena* sp. “Yamato-kamasu” (squares) deposited in ZUMT collection.

List of the specimens of family Gempylidae (Actinopterygii: Teleostei) deposited in the Department of Zoology, The University Museum, The University of Tokyo

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Abstract

A total of 71 specimens of the family Gempylidae, representing nine species in nine genera, are held in the Department of Zoology, The University Museum, The University of Tokyo, including three paratypes of *Tongaichthys robustus* Nakamura & Fujii, 1983. A specimen of *Thyrsitoides marleyi* Fowler, 1929 represents the first record of the species from waters off Fukushima Prefecture.

Introduction

The snake mackerel family Gempylidae, long considered a member of Perciformes (e.g., Nakamura and Parin 1993, 2001; Nakabo and Doiuchi 2013), comprises 26 species in 16 genera (Nakamura and Parin 1993, 2001; Roberts and Stewart 1997; Nakayama et al. 2014; Ho et al. 2017; Fricke et al. 2022). However, the family has been suggested as polyphyletic, and has also been frequently placed in the order Scombriformes, together with families such as Scombridae and Trichiuridae (Miya et al. 2013; Betancur-R. et al. 2017).

Some gempylid species are abundantly caught and important for fisheries worldwide, including Japan (Gushiken 1972; Nakamura and Parin 1993; Nakamura 1995; Chiang et al. 2014; Wong and Ho 2019; Ogata 2021). However, human consumption of some large-bodied species has been known to cause severe diarrhea due to high concentrations in the muscles of an indigestible wax ester (N. Y. 1983; Oikawa 2021). In Japan, marketing of two such species [*Lepidocybium flavobrunneum* (Smith, 1843) and *Ruvettus pretiosus* Cocco, 1833] is prohibited by law (Veterinary Sanitation Division, Environmental Health Bureau, Ministry of Health and Welfare 1970, 1981). Specimens held in the Department of Zoology, The University Museum, The University of Tokyo, representing nine species, are listed below.

Materials and Methods

Gempylid specimens in the Department of Zoology, The University Museum, The University of Tokyo (abbreviated as ZUMT) were identified following Nakamura and Parin (1993, 2001) and Nakabo and Doiuchi (2013). Data included in parentheses following specimen registration numbers are as follows: standard length; collection locality; collection date; and collector. Collection data of specimens are omitted when the same as that for the following specimen. Remarks are also given where applicable. The collection year and collector for some specimens was estimated by following Koeda et al. (2022).

The ZUMT specimens listed herein were primarily stored in Room 406 (specimen storage room), with additional specimens in Room 407 (including types and S. Tanaka specimens), in the museum building. Most were stored in shelved containers, although some larger specimens were stored in a glass tank (labelled “Gempylidae”; glass lid sealed with a silicon adhesive) in room 406 (as of Mar. 2022). Although some of the ZUMT specimens collected by Dr. Tokiharu Abe (most with collection data missing) had not been registered into the ZUMT collection, they are listed herein together with their ZUMT ABE number (underlined number written on specimen label), in the hope that Dr. Abe’s catalog books with collection data will be rediscovered in the future. Of the latter specimens, those labelled between ZUMT ABE 2700 to 6000 were collected from Palau by Dr. Abe between 1936 and 1937 (Koeda et al. 2022).

Results

In the ZUMT fish collection, 71 specimens of nine gempylid species, including three paratypes of *Tongaichthys robustus* Nakamura & Fujii, 1983, were confirmed. Ten specimens had been collected by Zenshiro Maekawa (前川善四郎) and Teijiro Suzuki (鈴木貞次郎) in 1956, over a wide area from the vicinity of Cocos Islands (eastern Indian Ocean) to Kiribati (central Pacific Ocean).

Species accounts

Family Gempylidae クロタチカマス科
***Diplospinus multistriatus* Maul, 1948** ホソクロタチ

PALAU

ZUMT ABE 4155 (160.9 mm; Palau)

***Gempylus serpens* Cuvier, 1829** クロタチカマス

JAPAN

ZUMT 24891 [approx. 701.3 mm (body cut into four parts); Numazu City, Shizuoka Pref. (obtained at Toyohashi Fish Market, Toyohashi City, Aichi Pref.); 23 Sept. 1932]

ZUMT 26274 (573.2 mm; probably collected from Kanagawa Pref.; coll. by personnel of Kanagawa Prefectural Fisheries Experimental Station (Odawara Branch)

ZUMT 55541 (580.0 mm), ZUMT 55542 (532.4 mm; obtained at Chinen Fisheries Cooperation Association, Chinen, Nanjo City, Okinawa Pref.; 15 Sept. 1986; coll. by H. Senou)

NEW GUINEA

ZUMT 63152 (177.4 mm), ZUMT 63153 (160.5 mm; New Guinea; coll. by T. Abe)

KIRIBATI

ZUMT 48594 [526.5 mm; approx. 170 km southeast of Banaba (2°07'S, 170°24'E); 28 Mar. 1956; coll. by Z. Maekawa and T. Suzuki]

ZUMT 48595 [605.3 mm; approx. 300 km southeast of Banaba (3°10'S, 171°07'E); 28 Mar. 1956; coll. by Z. Maekawa and T. Suzuki]

INDIAN OCEAN

ZUMT 48942 [372.2 mm; approx. 600 km southwest of Sumatra, Indonesia (7°00'S, 97°24'E); 6 Aug. 1956; coll. by Z. Maekawa and S. Suzuki]

ZUMT 49029 [185.5 mm; approx. 1200 km west of Sumatra, Indonesia (3°55'S, 90°49'E); 17 Apr. 1957; coll. by Z. Maekawa and S. Suzuki]

ZUMT 49066 [775.4 mm; approx. 850 km northwest of Cook Islands (10°03'S, 89°19'E); 22 Feb. 1955; coll. by M. Shinohara]

LOCALITY UNKNOWN

ZUMT 63242 (812.3 mm; no data)

Lepidocybium flavobrunneum (Smith, 1843) アブラソコムツ

INDONESIA

ZUMT 48746 (64.4 mm; approx. 250 km south of Seram Island, Moluccas (6°00'S, 130°0'E); Jan. 1956; coll. by Z. Maekawa and S. Suzuki)

ZUMT 48930 (45.1 mm; off Molu Island, Banda Sea; Jan. 1956; coll. by Z. Maekawa and S. Suzuki)

PACIFIC OCEAN

ZUMT 48987 [96.7 mm; approx. 860 km northeast of Marshall Islands (10°56'N, 178°34'E); 25 Nov. 1956; coll. by Z. Maekawa and S. Suzuki]

INDIAN OCEAN

ZUMT 48944 [84.0 mm; approx. 500 km north of Cocos Islands (7°00'S, 97°24'E); 6 Aug. 1956; coll. by Z. Maekawa and S. Suzuki]

ZUMT 49055 [143.6 mm; approx. 1000 km northwest of Cocos Islands (9°09'S 88°00'E; obtained from stomach of *Xiphias gladius*); 23 Feb. 1955; coll. by M. Shinohara]

Nealotus tripes Johnson, 1865 フウライカマス

PACIFIC OCEAN

ZUMT 48980 [60.2 mm; approx. 280 km northeast of Tabuaeran, Kiribati (5°12'N, 157°04'W); 5 Oct. 1956; coll. by Z. Maekawa and S. Suzuki)

Promethichthys prometheus (Cuvier, 1832) クロシビカマス

JAPAN

ZUMT 14478 (410.5 mm), ZUMT 14479 (471.2 mm; Okinawa Pref.; coll. by S. Sakaguchi)

ZUMT 20211 (183.0 mm; Wakayama Pref.; Jan. 1920; coll. by N. Ui)

ZUMT 26273 [388.0 mm; probably collected from Kanagawa Pref.; coll. by personnel of Kanagawa Prefectural Fisheries Experimental Station (Odawara Branch)]

ZUMT 26399 (163.0 mm; Iwa, Manazuru Town, Kanagawa Pref.; 1925; coll. by M. Fujita)

ZUMT 49116 (209.1 mm; Misaki, Miura City, Kanagawa Pref.; 1956; coll. by I. Tomiyama)

ZUMT 55648 (309.0 mm; obtained at Misaki Fish Market, Miura City, Kanagawa Pref.)

ZUMT 62752 (380.0 mm), ZUMT 62753 (358.0 mm), ZUMT 62754 (370.0 mm), ZUMT 62755 (295.0 mm), ZUMT 62756 (349.0 mm), ZUMT 62757 (441.0 mm), ZUMT 62758 (360.0 mm), ZUMT 62759 (382.0 mm), ZUMT 62760 (365.0 mm), ZUMT 62761 (421.0 mm), ZUMT 62762 (385.0 mm), ZUMT 62763 (430.0 mm), ZUMT 62764 (365.0 mm; Sagami Bay; 23 Oct. 2021; coll. with line fishing by K. Koeda on *R/V Kaimei*)

ZUMT ABE 10096 (113.5 mm; Manazuru City, Kanagawa Pref.; 2 Oct. 1954)

LOCALITY UNKNOWN

ZUMT 39345 (176.4 mm), ZUMT 62956 (217.5 mm), ZUMT 63241 (367.1 mm), ZUMT ABE 60-1542 (189.7 mm), ZUMT ABE 1543 (169.1 mm; no data)

Rexea prometheoides (Bleeker, 1856) カゴカマス

JAPAN

ZUMT 23641 (189.6 mm; Urado, Kochi City, Kochi Pref.; 10 Apr. 1931; coll. by T. Kamohara)

ZUMT 23642 (129.0 mm; Urado, Kochi City, Kochi Pref.; 26 Feb. 1930; coll. by T. Kamohara)

ZUMT 23748 (210.6 mm; Taniyama, Kagoshima City, Kagoshima Pref.; 20 July 1930)

ZUMT 46010 (176.0 mm; Yanagawa City, Fukuoka Pref.)

ZUMT 47213 (157.8 mm), ZUMT 47219 (114.7 mm; Kochi Pref.)

ZUMT 49885 [217.7 mm; Fukue, Goto City (Fukue-jima Island, Goto Islands), Nagasaki Prefecture; 10 June 1953; coll. by I. Tomiyama]

NEW ZEALAND

ZUMT 64083 [402.0 mm; Chatam Rise, approx. 140 km east of Christ Church (43°14'S, 174°29'E), 550–551 m depth; 6 Mar. 1983]

LOCALITY UNKNOWN

ZUMT 63246 (237.8 mm), ZUMT ABE 60-1154 (176.3 mm; no data)

***Ruvettus pretiosus* Cocco, 1833** バラムツ**JAPAN**

ZUMT 19586 [370.2 mm; probably collected from Mie Pref.; coll. by S. Hirano, Mie Prefectural Fisheries Experimental Station (Hamajima Branch)]

ZUMT 39651 (Muscle tissue only, approx. 22 mm length retained; probably collected from Okinawa Pref.)

ZUMT 57779 (447.5 mm; off Joga-shima Island, Miura City, Kanagawa Pref.; 7 July 1988; coll. by A. Itoh)

ZUMT 63238 (441.2 mm; Kume-jima Island, Okinawa Islands, Ryukyu Archipelago; Oct. 1929)

ZUMT ABE 61-849 (326.7 mm), ZUMT ABE 61-850 (334.2 mm; off Manazuru Town, Kanagawa Pref.; 15 Aug.–31 Dec. 1961)

PALAU

ZUMT ABE 4144 (173.0 mm; Palau)

NEW GUINEA

ZUMT 63145 (203.5 mm; New Guinea; coll. by T. Abe)

PACIFIC OCEAN

ZUMT 48378 [432.5 mm; approx. 630 km north of Howland Island, Northern Phoenix Islands (6°30'N, 177°06'W); 13 Aug. 1955; coll. by M. Shinohara]

ZUMT 48599 (300.9 mm), ZUMT 48600 [417.1 mm; approx. 140 km southeast of Banaba, Kiribati (1°43'S, 170°30'E); Jan. 1956; coll. by Z. Maekawa and S. Suzuki]

LOCALITY UNKNOWN

ZUMT 63237 (340.0 mm; no data)

***Thyrsitoides marleyi* Fowler, 1929** ナガタチカマス**JAPAN**

ZUMT 25263 (278.4 mm; off Onahama, Iwaki City, Fukushima Pref.; Aug. 1931; coll. by S. Tsunoda)

Remarks. In Tohoku District, *T. marleyi* has been recorded only from Hachinohe City, Aomori Prefecture. (Kitagawa et al. 2008; Nakabo and Doiuchi 2013; Hata et al. 2018). Therefore, the present specimen represents the first record of the species from Fukushima Prefecture.

***Tongaichthys robustus* Nakamura & Fujii, 1983**

SOUTH PACIFIC

ZUMT 54254 (219.3 mm), ZUMT 54255 (195.2 mm), ZUMT 54256 [212.3 mm; paratypes of *Tongaichthys robustus* Nakamura & Fujii, 1983; ca. 100 km south of Tonga (22°10.8'S, 175°23.6'W), 288–312 m depth; 11 Jan. 1977].

Remarks. This species was described by Nakamura and Fujii (1983) based on 16 specimens, including the three ZUMT specimens.

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References

- Betancur-R., R., Wiley, E. O., Arratia, G., Acero, A., Bailly, N., Miya, M., Lecointre, G. and Ortí, G. 2017. Phylogenetic classification of bony fishes. *BMC Evolutionary Biology*, 17: 162. DOI: 10.1186/s12862-017-0958-3
- Chiang, W.-C., Lin, P.-L., Chen, W.-Y. and Liu, D.-C. 2014. Marine fishes in eastern Taiwan. Fisheries Research Institute, Council of Agriculture, Keelung. vii + 331 pp. (In Chinese)
- Fricke, R., Eschmeyer, W. N., van der Laan, R. (eds) 2022. Eschmeyer's catalog of fishes: genera, species, references. Online Version, Updated 8 Mar. 2022. <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>. Accessed 17 Mar. 2022.
- Gushiken, S. 1972. Fishes of the Okinawa Islands. Ryukyu Suisan Kyokai, Naha. 247 pp. (In Japanese)
- Hata, H., Maekawa, T., Nakae, M. and Motomura, H. 2017. First specimen-based records of *Thrysitoides marleyi* (Perciformes: Gempylidae) from Kagoshima Prefecture, southern Japan. *Nature of Kagoshima*, 44: 41–45. (In Japanese)

- Ho, H.-C., Motomura, H., Hata, H. and Jiang, W.-C. 2017. Review of the fish genus *Epinnula* Poey (Perciformes: Gempylidae) with description of a new species from the Pacific Ocean. *Zootaxa*, 4363 (3): 393–408.
- Kitagawa, D., Imamura, H., Goto, T., Ishito, Y., Fujiwara, K. and Ueda, Y. 2008. Field Guide of the Fishes from the Tohoku District, North-eastern Waters of Japan. Tokai University Press, Hadano. xvii + 140 pp. (In Japanese)
- Koeda, K., Hata, H., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. History of the fish collection of the Department of Zoology, The University Museum, The University of Tokyo. *The University Museum, The University of Tokyo Material Reports*, 129: 1–24.
- Miya, M., Friedman, M., Satoh, T. P., Takeshima, H., Sado, T., Iwasaki, W., Yamanoue, Y., Nakatani, M., Mabuchi, K., Inoue, J. G., Poulsen, J. Y., Fukunaga, T., Sato, Y. and Nishida, M. 2013. Evolutionary Origin of the Scombridae (Tunas and Mackerels): Members of a Paleogene Adaptive Radiation with 14 Other Pelagic Fish Families. *PLoS ONE* 8(9): e73535.
- Nakabo, T. and Doiuchi, R. 2013. Gempylidae, snake mackerels. Pp. 1640–1643, 2221. In: Nakabo, T. (ed) *Fishes of Japan with pictorial keys to the species* third edition. Tokai University, Press, Hadano. (In Japanese)
- Nakamura, I. 1995. Gempylidae, escolares. Pp. 1106–1113. In: Fischer, W., Krupp, F., Schneider, W., Sommer, C., Carpenter, K. and Niem, V. H. (eds), *Guía FAO para la identificación para los fines de la pesca. Pacífico centro-oriental. Volumen II. Vertebrados Parte 1*. FAO, Rome. (In Spanish)
- Nakamura, I. and Fujii, E. 1983. A new genus and species of Gempylidae (Pisces: Perciformes) from Tonga Ridge. *Publications of the Seto Marine Biological Laboratory*, 27: 173–191.
- Nakamura, I. and Parin, N. V. 1993. FAO species catalogue. Vol. 15. Snake mackerels and cutlassfishes of the world (families Gempylidae and Trichiuridae). *FAO Fisheries Synopsis* 125, 15: i–vii + 1–136.
- Nakamura, I. and Parin, N. V. 2001. Gempylidae, snake mackerels. Pp. 3698–3708. In: Carpenter, K. E. and Niem, V. H. (eds) *FAO species identification guide for fishery purposes. The living marine resources of the western central Pacific*, vol. 6, no. 4. FAO, Rome.
- Nakayama, N., Kimura, Y. and Endo, H. 2014. *Neopinnula minetomai*, a new species of sackfish from off Kuchierabu-jima Island, southern Japan (Actinopterygii: Gempylidae). *Ichthyological Research*, 62: 320–326.
- Ogata, Y. 2021. *Rexea prometheoides*. Pp. 298–299. In: Murase, A., Ogata, Y., Yamasaki, Y., Miki, R., Wada, M. and Senou, H. (eds) *Coastal, shelf and deep-sea fishes around Kadogawa Bay, northern part of Miyazaki Prefecture, southern Japan*. Nobeoka Marine Science Station, Field Science Center, University of Miyazaki, Nobeoka. (In Japanese)
- Oikawa, K. 2021. Food poisoning and administrative response in the latter half of the Showa period. *Journal of Japanese Association of Food Science and Risk Analysis*, 16 (2): 99–115. (In Japanese)
- Roberts, C. D. and Stewart, A. L. 1997. Gemfishes (Scombroidei, Gempylidae, *Rexea*) of New Caledonia, southwest Pacific Ocean, with description of a new species. Pp. 125–141. In:

- Séret, B. (ed) Résultats des Campagnes MUSORSTOM, v. 17. Mémoires du Muséum National d'Histoire Naturelle, Paris (N. S.) (Série A) Zoologie vol. 174. Mémoires du Muséum National d'Histoire Naturelle, Paris.
- Veterinary Sanitation Division, Environmental Health Bureau, Ministry of Health and Welfare.
1970. Handling of *Ruvettus pretiosus* (Baramutsu no toriatsukai ni tsuite). Kannyu vol. 83.
- Veterinary Sanitation Division, Environmental Health Bureau, Ministry of Health and Welfare.
1981. Handling of *Lepidocybium flavobrunneum* (Aburasokomutsu no toriatsukai ni tsuite). Kannyu vol. 1.
- Wong, M.-K. and Ho, H.-C. 2019. Gempylidae. Pp. 1158–1163. In: Koeda, K. and Ho, H.-C. (eds) Fishes of southern Taiwan. National Museum of Marine Biology & Aquarium, Pingtung, Taiwan.
- Y., N. 1983. Escolar Incident. Journal of the Agricultural Chemical Society of Japan, 57 (10): 1077–1078. (In Japanese)

Report on the specimens of family Alepisauridae (Teleostei: Aulopiformes) deposited in the Department of Zoology, The University Museum, The University of Tokyo

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Abstract

The collection of Alepisauridae (Teleostei: Aulopiformes) deposited in the Department of Zoology, the University Museum, the University of Tokyo (ZUMT) were re-identified in the present study. In total 30 specimens of three genera of four species were found from the collection. No types are known for this family in ZUMT collection.

Introduction

The fish collection of families Alepisauridae (Teleostei: Aulopiformes) which preserved in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT) were re-identified in the present study. *Anotopterus* and *Omosudis* were previously recognized to be independent families Anotopteridae and Omosudidae, respectively. However, Davis (2010) revealed that these genera form a monophyletic clade based on morphology and genetic analysis, and suggested to treat them as a single family. The specimens of the family were re-identified by the first author, and listed below.

Materials and Methods

The specimens of Alepisauridae in ZUMT were re-identified in the present study, generally following Nakabo and Kai (2013) and Sutton et al. (2020), and confirmation of at least one diagnostic character. The standard length (SL) of the specimens were measured for all specimens. Species are arranged in alphabetical order. Local name, and collector's name and affiliation are given where known (from the specimen catalog or tag), with Japanese language equivalents in parentheses. The following list includes ZUMT number, SL, collection locality, collection date, collector or donator and affiliation, collection method, and remarks when available. The collection year and collector for some specimens was estimated by following Koeda et al. (2022). Although, some of the ZUMT specimens collected by Dr. Abe had not been formally cataloged into the ZUMT collection (and the data of some specimens not retained), such specimens which can recognize by having underbar with the number on the accompanying label, are listed herein with the number ZUMT ABE XXXX, due to the possibility of future discovery of Dr. Abe's remaining

catalog books with collection data. Catalog numbers after ZUMT 62000 are newly given during this study.

Collection of Alepisauridae in ZUMT

During this research, 30 specimens of three genera of four species of Alepisauridae were found from the ZUMT collection. Almost half of the specimens are Dr. Abe's collection, and unfortunately most of the specimens lacking data except for two specimens. No types are known for this family in ZUMT collection.

Alepisauridae ミズウオ科
Alepisaurus Lowe, 1833 ミズウオ属
Alepisaurus ferox Lowe, 1833 ミズウオ

- ZUMT 16178:** 1040.0 mm SL, Urakawa (浦河), Hokkaido, Apr. 1925, J. Katsuki (勝木重太郎).
- ZUMT 21702:** 998.0 mm SL, Tsunoore (角折), Ota (太田), Kashima (Kashima), Hitachinokuni (常陸国: presently Ibaraki Pref.), T. Murayama (村山忠吉).
- ZUMT 21984:** 910.0 mm SL, near Wakayama, Wakayama Pref., Jan. 1920.
- ZUMT 25391:** 1191.3 mm SL, 300 mile east of Nojima Cape (野島岬), Boso Peninsula (房総半島), Chiba Pref., 20 Jan. 1930, S. Suzuki (鈴木 新), Fukushima Prefectural Fisheries Experiment Station at Onahama.
- ZUMT 48379:** 841.5 mm SL, off south of Hawaiian Islands, 18 Aug. 1955, M. Shinohara (篠原 勝) boarded on training vessel of Toyama Prefectural Fisheries Highschool (富山県立水産高等学校練習船).
- ZUMT 48598:** 855.0 mm SL, Indian Ocean, 28 Mar. 1956, Z. Maekawa (前川善四郎) and T. Suzuki (鈴木貞次郎).
- ZUMT 62769** (Fig. 1): 1119.5 mm SL, northern coast of Miho Peninsula (三保半島), Shizuoka Pref., 17 Feb. 2022, K. Koeda (小枝圭太) and A. Teramura (手良村知功), stranded.
- ZUMT ABE 10635:** 1340.7 mm SL, Hokuyo (北洋: northern Pacific Ocean, Okhotsk and Bering seas), probably station number "C29".
- ZUMT ABE 10703:** 1090.0 mm SL, off Miyako (宮古), Iwate Pref., 4 May 1956, local name "Mizu-sawara".
- ZUMT ABE 61-1214:** 1055.7 mm SL, Manazuru (真鶴), Kanagawa Pref., 15 Aug. to 31 Dec. 1961.
- ZUMT 63840:** 854.0 mm SL; **ZUMT 63841:** 1100.0 mm SL; **ZUMT ABE 9724:** 959.0 mm SL; **ZUMT ABE 9725:** 723.7 mm SL; **ZUMT ABE 9726:** 546.2 mm SL; **ZUMT ABE 9727:** 1028.3 mm SL; **ZUMT ABE 59-100** (wooden tag 240): 1020.0 mm SL; **ZUMT ABE 59-101:** 1010.0 mm SL, locality unknown.

Anotopterus Zugmayer, 1911 ミズウオダマシ属
Anotopterus nikparini Kukuev, 1998 ミズウオダマシ

ZUMT 38999: 832.0 mm SL, off Kamchatskaya, Pacific Fisheries Research Office (太平洋漁業調査室) at Masago (真砂), Hakodate (函館), Hokkaido.

ZUMT ABE 59-94: 909.0 mm SL; **ZUMT ABE 59-95** (wooden tag 252): 590.5 mm SL; **ZUMT ABE 59-96** (wooden tag 80): 716.4 mm SL; **ZUMT ABE 59-97**: 594.0 mm SL; **ZUMT ABE 59-98**: 421.0 mm SL; **ZUMT ABE 59-99** (wooden tag 503): 735.0 mm SL, locality unknown.

Anotopterus vorax (Regan, 1913)

ZUMT 63620: 545.0 mm SL, South Pacific (63° S, 121° E), 1947 to 1977, probably donated by T. Abe (阿部宗明).

Remarks: Collection data was written on a scrap of notebook of Tokai Regional Fisheries Research Laboratory which Dr. Abe belonged from 1947 to 1977.

Omosudis Günther, 1887 キバハダカ属
Omosudis lowii Günther, 1887 キバハダカ

ZUMT 48946: 6 Aug. 1956, Z. Maekawa and T. Suzuki.

ZUMT 49094: 81.1 mm SL; **ZUMT 49095**: 62.0 mm SL, Voldate Island, 31 Jan. 1955, Z. Maekawa and T. Suzuki.

Remarks: On the ZUMT specimen ledger, ZUMT 49096 is also registered as *O. lowii*, but could not find during our investigation.

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References

Fricke, R., Eschmeyer, W.N., Van der Laan, R. (eds). 2022. Eschmeyer's catalog of fishes: genera, species, references. Electronic version.

<https://researcharchive.calacademy.org/research/ichthyology/catalog/getref.asp?id=20773>.

Accessed 10 Apr. 2022

- Heemstra, P. C. 2001. Ephippidae, Spadefishes (batfishes). Pp. 3611–3622. In: Carpenter, K. E. and Niem, V. H. (eds) FAO species identification guide for fishery purposes. The living marine resources of the western central Pacific, vol. 6. Bony fishes part 4 (Labridae to Latimeriidae). FAO, Rome.
- Nakabo, T. and Kai, Y. 2013. Alepisauridae. Pp. 438, 1856–1857. In: Nakabo, T. (ed) Fishes of Japan with pictorial keys to the species, 3rd edition. Tokai University Press, Hadano. (In Japanese)
- Koeda, K., Hata, H., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. History of the fish collection of the Department of Zoology, The University Museum, The University of Tokyo. The University Museum, The University of Tokyo Material Reports, 129: 1–24. (In Japanese)
- Sutton, T. T., Hulley, P. A., Wienerroither, R., Zaera-Perez, D. and Paxton, J. R. 2020. Identification guide to the mesopelagic fishes of the Central and South East Atlantic Ocean. Food and Agriculture Organization of the United Nations, Rome. xvi + 327 pp.



Figure 1. Fresh specimen of *Alepisaurus ferox*: ZUMT 62769, 1119.5 mm SL, northern coast of Miho Peninsular, Shizuoka Pref., 17 Feb. 2022, K. Koeda and A. Teramura, stranded.

List of the specimens of the family Anguillidae (Actinopterygii: Anguilliformes) deposited in the Department of Zoology, The University Museum, The University of Tokyo

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Abstract

During the survey of the fish collection in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT), four anguillid eels (*Anguilla anguilla*, *Anguilla japonica*, *Anguilla luzonensis*, and *Anguilla marmorata*) including 247 specimens of the yellow- and silver-eel stage and numerous glass eels of were confirmed. In the collection, *A. japonica* is most abundant, collected from Japan, Korean Peninsula, China, and Taiwan, the Japanese specimens through 20 prefectures, from Hokkaido to Okinawa. One of two specimens of Dr. Tokiharu Abe's personal collection kept at ZUMT collection room is identified as *A. luzonensis*. It represents as the first reliable record of the species from Palau.

Introduction

The freshwater eels, the family Anguillidae, are known as a most common eels in the order Anguilliformes. The taxon is the most important fishery resources as food, several species are aquacultured. Due to the high pressure of the fishery, especially the glass eels for aquaculture, most of congeners are included in the International Union for Conservation of Nature's Red List (IUCN Red List) (IUCN 2022). The fish collection in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT) is characterized as an early academic fish collection, consist of many fishes donated from various people and/or institutions, including local researchers, which is started from 1904 (Koeda et al. 2022). During the investigation of ZUMT collection, 247 specimens of yellow- and silver-eel stage and numerous glass eels of Anguillidae were found/identified. These were listed below with distributional notes.

Materials and methods

All specimens of Anguillidae in the Department of Zoology, The University of Museum, The University of Tokyo (abbreviated as ZUMT) were identified. Identification of the eel collections follows Smith (1999), Silfvergrip (2009), and Watanabe et al. (2009).

The Japanese standard names of *Anguilla anguilla* Linnaeus, 1758 and *Anguilla luzonensis* Watanabe, Aoyama & Tsukamoto, 2009 follow Fish Information Center and Museum (<http://www.osakana-center.com/wamei/wamei2021.pdf> accessed 26 April 2022) and Kita et al. (2020), respectively. Total lengths (TL) were measured by a 1000 mm ruler nearest to 1 mm, and others for identification by a digital caliper nearest to 0.1 mm. When the specimen was cut or damaged, expressed as “XXX mm+” with a short note (cf., tail tip damaged). For identification, vertebrae were counted by soft X-ray photos for partial specimens.

The ZUMT specimens herein listed were stored in the Room 407 of the building of the museum. Although Dr. Tokiharu Abe’s personal collection (Abe’s collection) had not been registered into the ZUMT collection except for early collection, they are herein listed together with their ZUMT ABE number (number written on the label). Unfortunately, most of collection data of Abe’s collection were missing, specimens with his personal catalog number 2700 to 6000 (=ZUMT ABE 2700 to 6000) are recognized as specimens collected from Palau between 1936 and 1937 (Koeda et al. 2022). The following list includes the ZUMT catalog number, TL, number of specimens in parentheses when more than one, local name in parentheses when noted, collection locality, collection or donated date, and collector or donator as much as possible. Wherever possible, we have included the Japanese text of the local name, locality and collector or donor wrote in the ZUMT specimen ledger in parentheses. Some specimens lack collection locality record, but we have written a possible location that could be inferred from the name of the collector and/or donor. The collection year and collector for some specimens was estimated by following Koeda et al. (2022).

Result and discussion

We confirmed 178 catalog numbers including 245 yellow/silver eels and numerous glass eels, and two specimens of Abe’s collection. At least 25 catalogued specimens and uncatalogued specimen, the holotype of *Anguilla remifera* Jordan & Evermann, 1902 (now synonymized under *Anguilla japonica* Temminck & Schlegel, 1846), were not found (Aizawa et al. 2022). Although ZUMT 42394 and ZUMT 43363 are catalogued as *Caranx* and *Hippocampus* in the specimen ledger, respectively, both were identified as *Anguilla japonica*. It may be caused by misreading.

The present collection of *A. japonica* consists of various Japanese localities including 20 prefectures. Although most of these are growing stage (yellow eel) and elver stage (glass eel), several mature stage eels (silver eel) collected from Ibaraki (ZUMT 17951, ZUMT 17952, ZUMT 17953, ZUMT 17954, dressed by the staff of a local eel wholesaler), Niigata (ZUMT 25311, 491 mm TL), and Fukuoka prefectures or the East China Sea (ZUMT 51221, 679 mm TL) are included. The northernmost specimen was collected from Utonato-numa (=Lake Utonai), Hidaka region of Hokkaido in 1919 (ZUMT 11319, 572 mm TL). The water of Lake Utonai flows into the Pacific Ocean through Yufutsu-gawa and Abira-gawa rivers which is the river where glass eels were recently recorded (Morita and Kuroki 2021). The present collection also includes very rare localities, e.g., mountain rivers and lakes, but since *A. japonica* has long been released into various rivers and lakes for commercial fishing, it is very difficult to use museum specimens for estimation of past natural distributions.

Anguilla marmorata Quoy & Gaimard, 1824 is confirmed from Honshu, Ryukyu Archipelago, Ogasawara Islands of Japan and Taiwan, Philippines and Palau. It is known as a tropical and subtropical species, transported from the tropical region to the coast of Japan by the Kuroshio current, north to Tone-gawa River, Ibaraki Prefecture (Mizuno and Nagasawa, 2009). The northernmost record was based on glass-eel specimens collected from estuary of Tone-gawa River in 1964 and 1965 by Nakamura and Kimura (1967), however, no yellow eels have been recorded. Therefore, ZUMT 16207 (675 mm TL) collected from Aino-kawa River is an only yellow-eel stage specimen from the system.

Jordan and Evermann (1902) reported four specimens of *Anguilla* from Formosa (=Taiwan), based on the specimens kept in the Imperial University of Tokyo (=University of Tokyo). Although three of four were not found including the holotype of *A. remifera*, the specimen recorded as *Anguilla manilensis* Bleeker, 1864 (a junior synonym of *A. marmorata*) was found (ZUMT 22106, 474 mm TL), which is reidentified as *A. luzonensis*.

From Abe's collection collected from Palau, two specimens of *Anguilla* were found. One (ZUMT ABE 3857, 771 mm TL) is identified as *A. luzonensis*, and another (ZUMT ABE 3744, 752 mm TL) as *A. marmorata*. *Anguilla luzonensis* is the newest species of the genus, yellow-stage eels of the species have been recorded only from Luzon Island of Philippines and Lanyu Island of Taiwan (Teng et al. 2009; Watanabe et al. 2009; Chen 2012). Although Barth et al. (2020) indicated its distribution including Palau based on the Global Biodiversity Information Facility database (GBIF) and their personal collections, no reliable records from Palau have been published (Abe 1939; Herre 1939; Bright and June 1981; Hibino and Mochioka 2018). Silfvergrip (2009) included Palau into the distributional region of *Anguilla celebesensis* Kaup, 1856, however it might be also regarded as *A. luzonensis*.

Family Anguillidae ウナギ科
Genus *Anguilla* Schrank, 1798 ウナギ属

Anguilla anguilla (Linnaeus, 1758)
ヨーロッパウナギ

[No locality]

ZUMT 12236, 270 mm TL, ZUMT 12237, 253 mm TL, donated by the British Museum, UK.
ZUMT 63996, 576 mm TL, donated by F. Guitel, L'Université de Rennes, France (Fig. 1A).

Anguilla japonica Temminck & Schlegel, 1846
ニホンウナギ

[Japan: Hokkaido]

ZUMT 11319, 572 mm TL (local name Unaki ウナギ), Utonaito-numa (=Lake Utonai) (ウトナイト沼), Oct. 1919, M. Tsuda (津田美津彦/北海道水産試験場室蘭支場).

[Japan: Honshu]

- ZUMT 1549, 249–256 mm TL (2), Gifu Pref. (岐阜), before 1908.
- ZUMT 1565, ca. 50 mm TL (numerous, glass eel), a river of Numazu, Shizuoka Pref. (駿州沼津ノ川), 2 Mar. 1899, K. Aoki (青木熊吉).
- ZUMT 3030, 162 mm TL, Ogori, Yamaguchi Pref. (周防小郡), 24 Aug. 1911, T. Oda (小田常太郎／山口県立農業学校).
- ZUMT 6911, 251 mm TL, Itakura-numa Pond, Gunma Pref. (板倉沼), 26 Jan. 1916, S. Takano (高野貞助／群馬県館林農業高校).
- ZUMT 8662, 278 mm TL (local name Kaya カヤ), Yamada-gawa River, Kuji-gawa River system, Ibaraki Pref. (久慈川支流山田川), before 1919, E. Sasuga (流石英治／茨城師範学校).
- ZUMT 8663, 340 mm TL (local name Goma ゴマ), probably Ibaraki Pref. (donated with ZUMT 8662), before 1919, E. Sasuga (流石英治／茨城師範学校).
- ZUMT 9144, 295 mm TL, probably Himeji, Hyogo Pref. (donated by Himeji, Hyogo Pref.), before 1919, R. Abe and C. Sakamoto (阿部良平・坂本長蔵).
- ZUMT 9858, 231 mm TL, Hyogo Pref., before 1920, K. Yamadori (山鳥吉五郎).
- ZUMT 9877, 280 mm TL, Suo-oshima Island, Yamaguchi Pref. (大島), before 1920, T. Yamahara (山原種逸／山口県岩国中学校).
- ZUMT 10022, 419 mm TL, Kayu-kawa River, Nagara-gawa River system, Gifu Pref. (長良川支流粥川谷), before 1921, S. Yamada (山田修一郎／高山尋常小学校).
- ZUMT 10514, 140 mm TL, a small river nearby Yaita, Tochigi Pref. (塩谷郡矢板町), before 1922, S. Arakawa (荒川重理／栃木県立矢板町県立農林学校).
- ZUMT 10607, 157 mm TL, Tonda-gawa River, Wakayama Pref. (紀州西牟婁郡富田川), 22 Sept. 1922, H. Kuroiwa (黒岩 恒).
- ZUMT 13486, 188 mm TL, probably Fukushima Pref., before 1924, M. Kanno (菅野美芳).
- ZUMT 17951, 95 mm (head only), ZUMT 17952, 556 mm+ (teared body without head), ZUMT 17953, 664 mm+ (teared body without head), ZUMT 17954, 325 mm+ (teared body without most of tail), Tsuchiura, Ibaraki Pref. (茨城土浦), before 1928, K. Hattori (服部兼松) (Fig. 1B, C, D).
- ZUMT 18034, 315 mm TL, probably Yamanashi Pref., before 1928, K. Yajima (矢島種次／甲府中学校).
- ZUMT 18588, 326 mm TL, about 12 km from river mouth of Hiki-gawa River, Wakayama Pref. (紀州日置川), rec. 10 Dec. 1928, S. Sakaguchi (坂口総一郎／和歌山県師範学校).
- ZUMT 19926, ca. 80 mm TL (7, dried), Tokyo Pref. (=currently Tokyo Met.), coll. and rec. before 21 Apr. 1930, S. Furuta (古田正吉).
- ZUMT 21007, 283 mm TL, Tokyo Market, Tokyo Pref. (=currently Tokyo Met.), before 1930.
- ZUMT 21397, 255 mm TL, ZUMT 21398, 214 mm TL, ZUMT 21471, 142 mm TL, Atsugi, Kanagawa Pref. (厚木), rec. 28 Apr. 1929, T. Senba (仙波高尚／神奈川県立厚木中学校).
- ZUMT 22446, 329 mm TL, Tanabe, Wakayama Pref. (紀州田辺), rec. 11 Aug. 1920, N. Ui (宇井縫蔵).
- ZUMT 23024, 149 mm TL, Lake Hamana, Shizuoka Pref. (浜名湖), id. 27 Sept. 1930, S.

Omori (大恵尚一／浜松市立高等女学校).

ZUMT 23123, 212 mm TL (local name Unagi ウナギ), ZUMT 23124, 174 mm TL (local name Unagi ウナギ), ZUMT 23125, 175 mm TL (local name Unagi ウナギ), Arii and others, Mie Pref. (有井村その他), Aug. 1927, Y. Tsuchiga (槌賀安平／木本中学校).

ZUMT 24855, 203 mm TL (白黄化), Katase-gawa River, nearby Fujisawa, Kanagawa Pref. (相州片瀬川藤沢町付近), before 1931, N. Sato (佐藤尚勝／湘南中学校).

ZUMT 25311, 491 mm TL, off Niigata Pref. (新潟沖), before 1931, S. Yoshihara (吉原七司)

ZUMT 26096, 316 mm TL (local name Unagi ウナギ), ZUMT 26097, 320 mm TL (local name Unagi ウナギ), Toyo-gawa River, nearby Shinshiro, Aichi Pref. (豊川上流新城付近), 24 July 1932, S. Yoshida (吉田関子).

ZUMT 26136, 596 mm TL (local name Goma-unagi ゴマウナギ), Mikawa-shinshiro, Aichi Pref. (三河新城), July 1932, S. Yoshida (吉田関子).

ZUMT 26210, 167–350 mm TL (12), Kuji-gawa River, Tanakura, Fukushima Pref. (磐城棚倉町久慈川), before 1933, H. Tsunoda (角田春彦／小名濱小学校).

ZUMT 26691, 187 mm TL, Hashimoto, Wakayama Pref. (橋本町), before 1934.

ZUMT 28291, 172 mm TL, ZUMT 28292, 139 mm TL, ZUMT 28293, 193 mm TL, ZUMT 28294, 119 mm TL, ZUMT 28328, 60 mm TL (glass eel), Chiba Pref., 1927, S. Kohama (小浜 秀／千葉県女子師範学校).

ZUMT 29173, 149 mm TL, ZUMT 29174, 243 mm TL, Chiba Pref., before 1934, T. Suzuki (鈴木寅之助).

ZUMT 30854, 329 mm TL, Hi-numa Pond, Ibaraki Pref. (涸沼), before 1935.

ZUMT 31241, 33.2 mm+ (tail tip damaged), Matsue, Shimane Pref. (松江), before 1935, R. Yanai (柳井隆一／松江高等学校).

ZUMT 34561, ca. 40–180 mm TL (9, dried), Hi-numa Pond, Ibaraki Pref. (涸沼), 22 May 1935, S. Tanaka (田中茂穂).

ZUMT 35260, 186 mm TL, probably Shizuoka Pref., before 1936, S. Araki (荒木精一／浜松市立高等女学校).

ZUMT 37576, 407 mm TL, ?Misaki or Ushimado, Kanagawa Pref. (三崎？牛窓か？), before 1936, S. Miyoshi (三好 晋／水戸高等学校).

ZUMT 37763, 167 mm TL, probably Fukushima Pref., before 1937, T. Saito (斎藤知賢).

ZUMT 38583, 320 mm TL, a lake of Nagano Pref., 1915, A. Tanaka (田中阿歌麿).

ZUMT 39146, 309 mm TL, ZUMT 39147, 273 mm TL, pond reared specimens, Kyoto Pref., June 1937, S. Tsuji (辻 季吉／河守蚕業学校).

ZUMT 41822, 351 mm TL, ZUMT 41823, 324 mm TL, Asamushi, Aomori Pref. (浅虫), before 1942, S. Tanabe (田辺貞夫).

ZUMT 43950, 252 mm TL, ZUMT 43952, 201 mm TL, ZUMT 43953, 221 mm TL, Kofu, Yamanashi Pref. (甲府), before 1942.

ZUMT 43992, 163 mm TL, ZUMT 43993, 189 mm TL, ZUMT 43994, 157 mm TL, Kamogawa River, Kyoto Pref. (賀茂川), before 1942.

ZUMT 44489, 105 mm TL (local name Meso メソ), ZUMT 44490, 82 mm TL (local name Meso メソ), probably Chiba Pref., before 1943, Y. Imai and H. Ichihara (今井雪雄・市原浜夫).

ZUMT 44515, 185 mm TL, ZUMT 44516, 176 mm TL, ZUMT 44517, 229 mm TL, ZUMT

- 44678, 131 mm TL, ZUMT 44679, 199 mm TL, Sumoto, Awaji-shima Island, Hyogo Pref. (淡路島洲本), before 1943.
- ZUMT 44711, 292 mm TL, ZUMT 44712, 209 mm TL, nearby Kofu, Yamanashi Pref. (甲府付近), rec. 21 July 1921.
- ZUMT 44747, 62–101 mm TL (8), Chiba, Chiba Pref., 1925.
- ZUMT 44958, 193 mm TL, ZUMT 44959, 245 mm TL, probably Chiba Pref., before 1943, T. Suzuki (鈴木寅之助).
- ZUMT 45268, 314 mm TL, Kabura-gawa River, Tone-gawa River system, Gunma Pref. (上州鐺川), before 1943.
- ZUMT 45541, 193 mm TL, ZUMT 45542, 291 mm TL, Tochigi Pref., rec. Sept. 1931.
- ZUMT 56828, 119 mm TL, ZUMT 56829, 433 mm TL, inner part of Koajiro Bay, Misaki, Kanagawa Pref. (三崎町小網代湾奥部), 1 Aug. 1987.
- ZUMT 63994, 359 mm TL, nearby Iga-ueno, Nara Pref. (伊賀上野).
- ZUMT 57316, 117 mm TL, Yokosuna, Shimizu, Shizuoka Pref. (清水市横砂地先), 30 Oct. 1987, M. Aizawa and K. Mochizuki (藍澤正宏・望月賢二).
- ZUMT 57434, 77–92 mm TL (2), mouth of Haya-kawa River, Odawara, Shizuoka Pref., 22 Nov. 1987, M. Aizawa and H. Senou (藍澤正宏・瀬能 宏).

[Japan: Shikoku]

- ZUMT 1367, 219–267 mm TL (2), probably Ehime Pref., May 1907, Y. Shimizu (清水保之／松山商業学校).
- ZUMT 43462, 292 mm TL, Kochi Pref, before 1942.

[Japan: Kyushu]

- ZUMT 1564, ca. 60 mm TL (numerous, glass eel), Oyodo-gawa River, Miyazaki Pref. (日向大淀川), Jan. 1900, T. Ogura (小倉孝治／宮崎中学校).
- ZUMT 1566, ca. 60 mm TL (numerous, glass eel), Oyodo-gawa River, Miyazaki Pref. (日向大淀川), 6 Nov. 1900, T. Ogura (小倉孝治／宮崎中学校).
- ZUMT 2295, 174 mm TL, Nagasaki Pref., before 1909.
- ZUMT 5901, 342 mm TL, a small river of Shimokoshi-shima Island, Kagoshima Pref. (下甕島), 24 July 1899.
- ZUMT 18091, 655 mm TL, ZUMT 18092, 565 mm TL (local name Kuro 黒), ZUMT 18093, 475 mm TL (local name Ao 青), ZUMT 18095, 516 mm TL (local name Aka 赤), Ariake-kai Sea, before 1928, Fukuoka Prefectural Fisheries Experimental Station (福岡県水産試験場).
- ZUMT 32099, 250 mm TL, Kagoshima Pref., before 1936.
- ZUMT 33734, 166 mm TL, ZUMT 33735, 260 mm TL, probably Sendai, Kagoshima Pref., before 1936, T. Arii (有井徳之丞／鹿児島県川内中学校).
- ZUMT 35194, 258 mm TL, Ariake-kai Sea, Okinohata, Fukuoka Pref. (沖端), 26–31 May 1931, I. Tomiyama (富山一郎).
- ZUMT 35666, 192 mm TL, ZUMT 35667, 220 mm TL, ZUMT 35668, 219 mm TL, ZUMT 35669, 226 mm TL, ZUMT 35676, 233 mm TL, Ariake-kai Sea, Oct. 1931, I. Tomiyama (富山一郎).

ZUMT 41120, 315 mm TL, Kagoshima Bay, Kagoshima Pref., rec. June 1938, K. Ogawa (小川一男／鹿児島女子師範学校).

ZUMT 51221, 679 mm TL, East China Sea or Fukuoka, Fukuoka fishmarket, Dec. 1959.

[Japan: Ryukyu Archipelago]

ZUMT 9482, 477 mm TL, Okinawa Pref., before 1920, H. Kuroiwa (黒岩 恒).

ZUMT 14033, 331 mm TL, ZUMT 14034, 306 mm TL, ZUMT 14035, 277 mm TL, ZUMT 14036, 311 mm TL, ZUMT 14037, 284 mm TL, ZUMT 14038, 313 mm TL, ZUMT 14039, 322 mm TL, probably Okinawa-jima Island, 1925, H. Yahiro (屋代弘孝／沖縄県産業課).

ZUMT 45890, 53–61 mm TL (15, glass eel), probably Okinawa Pref., before 1943.

ZUMT 58140, 96 mm TL, mountain torrent of Nakama-gawa River, Iriomote-jima Island (西表島仲間川), 10 July 1988, M. Aizawa and H. Senou (藍澤正宏・瀬能 宏).

ZUMT 60170, 134 mm TL, middle part of Aira-gawa River, Iriomote-jima Island (西表島相良川), 19 Aug. 1989.

[Japan: Izu Islands]

ZUMT 41915, 423 mm TL, probably Hachijo-jima Island, before 1942, K. Uchiyama (内山吉五郎).

[Japan: Ogasawara Islands]

ZUMT 1548, 300 mm TL, before 1908, C. O. Whitman.

[Japan: locality details unknown]

ZUMT 34803, 264 mm TL; ZUMT 34804, 272 mm TL; ZUMT 34805, ca. 50–110 mm TL (22, dried).

[Korean Peninsula: locality details unknown]

ZUMT 12882, 501 mm TL; ZUMT 12883, 326 mm TL; ZUMT 12884, 330 mm TL; ZUMT 12885, 466 mm TL, ZUMT 12886, 292 mm TL, before 1924.

ZUMT 38061, 222 mm TL, before 1937.

[Taiwan]

ZUMT 2509, 350 mm TL, Kee-lung (基隆), 18 Mar. 1908, K. Akamatsu (赤松邦太郎).

ZUMT 19011, 338 mm TL, ZUMT 19012, 342 mm TL, ZUMT 19013, 314 mm TL, ZUMT 19014, 375 mm TL, ZUMT 19015, 318 mm TL, Taipei Market (台北市場), Apr. 1929, H. Sato (佐藤春吉／台湾基隆中学校).

ZUMT 23611, 205 mm TL, freshwater of Taipei (台北), S. Arakawa (荒川重理／台北高等学校).

ZUMT 25129, 297 mm TL, ZUMT 25130, 249 mm TL, ZUMT 25131, 315 mm TL, Xindian River (淡水河新店), Tansui River system, Aug. 1929, M. Imai (今井倭武／台北医学専門学校).

[China]

ZUMT 12355, 598 mm TL; ZUMT 20732, 343 mm TL, nearby Beijing (北京); ZUMT 31107, 263 mm+ (tail tip damaged), Manchuria and China (満州及び支那), before 1925.
ZUMT 63995, 917 mm TL, Longwangtang, Dalian, Liaoning (旅順管内龍王塘水源地), 10 Sept. 1934.

[No locality]

ZUMT 17597, 241 mm TL; ZUMT 42394, 241 mm TL; ZUMT 43363, 80 mm TL; ZUMT 63992, 543 mm TL; ZUMT 63993, 630 mm TL; ZUMT 64027, 167 mm TL; ZUMT 64028, 330 mm TL; ZUMT 64030, ca. 110 mm TL (6), dried; ZUMT 64031, ca. 300 mm TL, dried; ZUMT 64032, ca. 200 mm TL (2), dried.

Anguilla luzonensis Watanabe, Aoyama & Tsukamoto, 2009

ウグマウナギ

[Taiwan]

ZUMT 22106, 474 mm TL, Lan-yu Island (Orchid Island), originally written as Kotosho.

[Palau]

ZUMT ABE 3857, 771 mm TL, 1936 (Fig. 1E, G).

Remarks on morphological features. Proportional characters of ZUMT ABE 3857 are following: head 16.5% TL; predorsal length 35.6%; preanal length 42.9% TL; trunk length 26.6% TL; horizontal distance between verticals through dorsal-fin origin and anus 7.8% TL; length of gape 47.2% of head length. In addition, tooth on maxilla of the present specimen is arranged as a broad band. The present specimen agrees with *A. celebesensis*, *Anguilla interioris* Whitley, 1938, *A. luzonensis* and *Anguilla megastoma* Kaup, 1856 in having broad, undivided tooth bands and mottled pattern on skin, but distributional ranges of *A. interioris* and *A. megastoma* are restricted in New Guinea and southern Indonesia, not overlapped with that of *A. celebesensis* and *A. luzonensis*, separated by currents. *Anguilla luzonensis* is closely similar to *A. celebesensis*, eight key characters including six proportional and two meristic characters of the species are overlapped with those species. However, the former was described as a distinguishable species by Watanabe et al. (2009) because means of those characters are slightly different. Although those characters are deeply overlapped between both species, the present specimen was tentatively identified as *A. luzonensis* because predorsal length and length of gape is remarkably larger than that of *A. celebesensis* provided by Watanabe et al. (2009). The result is also supported by Barth et al. (2020). More abundant morphological information of *A. celebesensis* and *A. luzonensis* are required with molecular evidences.

Anguilla marmorata Quoy & Gaimard, 1824

オオウナギ

[Japan: Honshu]

ZUMT 16207, 675 mm TL, Aino-kawa River, Tone-gawa River system, Hanyu, Satama Pref., 16 July 1924, K. Matsumura (松村 清).

ZUMT 20399, 344 mm TL, Tanabe, Wakayama Pref. (紀州田辺), before July 1920, N. Ui (宇井縫藏).

[Japan: Ryukyu Archipelago]

ZUMT 8805, 366 mm TL, freshwater of Yaeyama Islands, May 1919, H. Kuroiwa (黒岩 恒).

ZUMT 11163, 523 mm TL, ZUMT 11164, 342 mm TL, ZUMT 15337, 410 mm TL, Okinawa-jima Island, S. Sakaguchi (坂口総一郎／沖縄県立第一中学校).

ZUMT 38157, 143 mm TL, Okinoerabu-jima Island, Kagoshima Pref. (沖永良島), Aug. 1937, K. Ogawa (小川一男／鹿児島女子師範学校).

ZUMT 60169, 95 mm TL, ZUMT 60185, 54–68 mm TL (3), middle part of Aira-gawa River, Iriomote-jima Island, 19 Aug. 1989.

[Japan: Ogasawara Islands]

ZUMT 1561, 45–148 mm TL (9), freshwater of Chichi-jima Island, 25 Mar. (Y unknown), before 1908.

[Taiwan]

ZUMT 19016, 285 mm TL, ZUMT 19017, 292 mm TL, ZUMT 19018, 285 mm TL, Taipei Market (台北市場), May 1929, H. Sato (佐藤春吉／台湾基隆中学校).

ZUMT 25147, 280 mm TL (老鰻 ローマー), ZUMT 25148, 261 mm TL (老鰻 ローマー), Tansui River (淡水河), M. Imai (今井倭武／台北医学専門学校).

[Philippines]

ZUMT 42637, 159 mm TL, ZUMT 42638, 168 mm TL, ZUMT 42639, 305 mm TL, ZUMT 42640, 232 mm TL, ZUMT 48518, 253 mm TL, ZUMT 48528, 401 mm TL, Basilan Island, 1926, U. Yamamura (山村樞次郎).

[Palau]

ZUMT 3744, 752 mm TL, 1936 (Fig. 1F, H).

[No locality]

ZUMT 63997, 425 mm TL.

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References

- Abe, T. 1939. A list of the fishes of the Palao Islands. Palao Tropical Biological Station studies, I (4): 523–583.
- Aizawa, M., Koeda, K., Sakamoto, K. and Ueshima, R. 2022. Fish types deposited in the Department of Zoology, The University Museum, The University of Tokyo – Part 1: Anguilliformes. The University Museum, The University of Tokyo Material Reports, 128: 137–149.
- Barth, J. M. I., Gubili, C., Matschiner, M. Tørresen, O. K., Watanabe, S., Egger, B., Han, Y.-S., Feunteun, E., Sommaruga, R. Jehle R. and Schabetsberger, R. 2020. Stable species boundaries despite ten million years of hybridization in tropical eels. Nature Communications, 11, 1433. DOI: 10.1038/s41467-020-15099-x
- Bright, G. R. and June, J. A. 1981. Freshwater Fishes of Palau, Caroline Islands. Micronesica, 17 (1–2): 107–111.
- Chen, I.-S., Tseng, C.-S. and Shao, K.-T. 2012. Red data book of freshwater fishes of Taiwan. Forestry Bureau, Council of Agriculture, Executive Yuan, Taipei, 240 pp.
- Herre, A. W. C. T. 1939. On a collection of fishes from Nanyo, the Japanese mandated islands. Annotationes Zoologicae Japonenses, 18 (4): 298–307.
- Hibino, Y. and Mochioka, N. 2018. Fish collection of Nanyo Islands found from the specimen building of Fisheries and 3rd Building of Faculty of Agriculture, Kyushu University, collected by Dr. Teiso Esaki. Bulletin of the Kyushu University Museum, 15–16: 1–15. (In Japanese with English abstract)
- IUCN. 2022. The IUCN Red List of Threatened Species. Version 2021-3. <https://www.iucnredlist.org> (accessed 25 April 2022)
- Jordan, D. S. and Evermann, B. W. 1902. Notes on a collection of fishes from the island of Formosa. Proceedings of the United States National Museum, 25: 315–368.
- Kita, T., Matsushige, K., Endo, S., Mochioka, N. and Tachihara, K. 2021. First Japanese records of *Anguilla luzonensis* (Osteichthyes: Anguilliformes: Anguillidae) glass eels from Okinawa-jima Island, Ryukyu Archipelago, Japan. Species Diversity, 26 (1): 31–36.
- Koeda, K., Hata, H., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. History of the fish collection of the Department of Zoology, The University Museum, The University of Tokyo. The University Museum, The University of Tokyo Material Reports, 129: 1–24. (In Japanese)
- Mizuno, K. and Nagasawa, K. 2009. The current status of the geographical distribution of the giant mottled eel *Anguilla marmorata* (Anguilliformes, Anguillidae) in Japan. Bulletin of the Biogeographical Society of Japan, 64: 79–87. (In Japanese with English abstract)

- Morita K. and Kuroki, M. 2021. Japanese eel at the northern edge: glass eel migration into a river on Hokkaido, Japan. *Ichthyological Research*, 68: 217–221.
- Nakamura, M. and Kimura, T. 1967. On the elvers of *Anguilla marmorata* Quoy et Gaimard collected in the lower stream of the Tone River. *Miscellaneous Reports of the Research Institute for Natural Resources Tokyo*, 69: 135–138. (In Japanese)
- Silfvergrip, A. M. C. 2009. CITES identification guide to the freshwater eels (Anguillidae) with focus on the European eel *Anguilla anguilla*. The Swedish Environmental Protection Agency, Stockholm. 132 pp.
- Smith, D. G. 1999. Anguillidae. Pages 1630–1636. In: Carpenter, K. E. and Niem, V. H. (eds.) *Species identification guide for fisheries purposes. The living marine resources of the western central Pacific. Batoid fishes, chimeras and bony fishes part 1 (Elopidae to Linophrynidae)*. FAO, Rome.
- Teng, H.-Y., Lin, Y.-S. and Tzeng, C.-S. 2009. A new *Anguilla* species and a reanalysis of the phylogeny of freshwater eels. *Zoological Studies*, 48 (6): 808–822.
- Watanabe, S., Aoyama, J. and Tsukamoto, K. 2009. A new species of freshwater eel *Anguilla luzonensis* (Teleostei: Anguillidae) from Luzon Island of the Philippines. *Fisheries Science*, 75: 387–392.



Figure 1. Featured specimens of *Anguilla* in ZUMT collection. A, *Anguilla anguilla*, ZUMT 63996, 576 mm TL; B, C, D, teared specimens of *Anguilla japonica*, ZUMT 17952, 556 mm+ (B), ZUMT 17953, 664 mm+ (C), ZUMT 17954, 325 mm+ (D), Tsuchiura, Ibaraki Pref.; E, whole body of *Anguilla luzonensis*, ZUMT ABE 3857, 771 mm TL, Palau; F, whole body of *Anguilla marmorata*, ZUMT ABE 3744, 752 mm TL, Palau; G, lateral view of head, *A. luzonensis*, ZUMT ABE 3857, 771 mm TL; H, lateral view of head, *A. marmorata*, ZUMT ABE 3744, 752 mm TL.

Report on the specimens of the family Zenarchopteridae (Teleostei: Beloniformes) deposited in the Department of Zoology, The University Museum, The University of Tokyo

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Abstract

During a detailed investigation of the collection of Zenarchopteridae (Teleostei: Beloniformes) deposited in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT), 75 specimens in two genera without type specimens were found. Based on the observation of these collection, morphological variations into *Zenarchopterus dunckeri* Mohr, 1926 and a newly distribution of *Zenarchopterus xiphophorus* Mohr, 1934 from Borneo were suggested. We also noted on the taxonomic status of the species formerly treated as *Zenarchopterus buffonis* (Valenciennes, 1847) in recent studies.

Introduction

Zenarchopteridae (Beloniformes) is the family of viviparous halfbeaks, with five genera and 59 valid species in the Indo-Pacific (Collette 2004; Tan and Lim 2013; Nelson 2016; Kobayashi et al. 2020), which characterized by their modified anal-fin rays in males. Although they have traditionally been treated as a part of the halfbeaks family Hemirhamphidae, recent phylogenetic studies have suggested their phylogenetic uniqueness (e.g. Lovejoy et al. 2004).

Zenarchopterus is a genus that inhabits various environments, from coastal areas to rivers, and comprises 19 valid species (Collette 2004), one of which has been recorded from Japan (*Z. dunckeri*: Meguro 1972). However, the distribution of each species is still poorly known, attributable to the unclear taxonomy of the genus (Collette 1982), unlike other well-studied freshwater genera such as *Dermogenys*, *Hemirhamphodon* and *Nomorhamphus* (Meisner 2001; Anderson and Collette 2004).

In this study, we re-identified the specimen of zenarchopterid halfbeaks in the Department of Zoology, The University Museum, The University of Tokyo (abbreviated as ZUMT), and note on the taxonomic status and distribution of selected species of the genus *Zenarchopterus*.

Materials and Methods

The specimens of Zenarchopteridae in ZUMT were identified using following reference: Anderson and Collette (2004); Meisner (2001); Mohr, (1926; 1934) and unpublished data by HK. The synonymy and notation of valid names were followed Kottelat (2013), except for the following two species. Brief description are given for selected specimens. Counts of the unpaired fin rays and vertebrae (total = precaudal + caudal) were obtained from radiographs (Softex, E-3). The hypural centrum was treated as a caudal vertebra. Measurements were followed Meisner (2001). Sexes were identified based on the shape of the andropodium.

Contents included in parentheses following registration numbers as follows: [specimen counts (if plural specimens included in the lot), sex (if possible to identify), standard length (in mm), collection locality, collection date, collector]. Collection data of the specimens are omitted if it matches the immediately following specimen. The collection year and collector for some specimens was estimated by following Koeda et al. (2022).

Although, some of the ZUMT specimens collected by Dr. Abe had not been formally cataloged into the ZUMT collection (and the data of some specimens not retained), such specimens which can recognize by having underbar with the number on the accompanying label, are listed herein with the number ZUMT ABE XXXX, due to the possibility of future discovery of Dr. Abe's remaining catalog books with collection data. Catalog numbers after ZUMT 62000 are newly given during this study. ZUMT-ABE 2700–6000 are recognized as which collected from Palau in 1936–1937 (Koeda et al. 2022).

Collection of Zenarchopteridae in ZUMT

In total, 75 specimens of 2 genera, 7 species were found in ZUMT collection. No types are known for this family in the collection. Most of the specimens were collected from southeast Asia, with part of the series of the specimens donated by Tom Harrison (Sarawak Museum) to Ichiro Tomiyama (ZUMT) when Dr. Tomiyama visited Sarawak on 1961 (Koeda et al. 2022). Although the information of the detailed locality and date of these specimens were not known, it was estimated to collected near Sarawak due to there species composition of the series, and the previous tag number are listed together with newly given ZUMT cataloged number. Only few Japanese specimens which *Z. cf. dunckeri* “コモチサヨリ” from the Yaeyama Islands in Okinawa, Japan, were found from the collection. Four lots of specimens, *Zenarchopterus* spp. (ZUMT 55028–55031, Borneo Island, Sarawak, August 1962, coll. I. Tomiyama) were not found (these lots possibly be held by Bruce B. Collette (National Museum of Natural History, Smithsonian Institution: USNM) or duplicated numbers of ZUMT 62519–62525). Several specimens were considered as undescribed species and/or species complex (see remarks).

Zenarchopteridae コモチサヨリ科

Dermogenys Kuhl & van Hasselt in van Hasselt, 1823

Dermogenys siamensis Fowler, 1934

ZUMT 62423: 4 (1 male: 28.8; 3 females: 27.6–39.6), localities and dates unknown.

Description: Dorsal-fin rays 9–10; anal-fin rays 14–15; vertebrae 39–40 (22–23 + 16–17).

Dermogenys cf. orientalis

ZUMT 62424: 9 females, 40.3–53.9, localities and dates unknown.

Description: Dorsal-fin rays 9–11; anal-fin rays 15; vertebrae 38–40 (24–25 + 15); scales on longitudinal series 40, transverse series 9; body depth at pectoral-fin origin (BDP1) 14.1–15.4 % SL, at pelvic-fin origin (BDP2) 13.5–16.0 % SL.

Remarks: Although the observed lot contained only females and lacked locality information, it was tentatively identified as *Dermogenys orientalis* (Weber, 1894) based on a combination of the following morphological traits: a higher maximum body depth at pelvic-fin origin than females of other congeners except those of *D. vogti* Brembach, 1982 (see Meisner 2001); a smaller number of scales on longitudinal series than that of *D. vogti* (40 vs. 52 in a paralectotype of *D. vogti*: HK unpublished data).

Zenarchopterus Gill, 1864 コモチサヨリ属

Zenarchopterus cf. dunckeri コモチサヨリ

Remarks: The present specimens shared a similar structure of the modified anal-fin rays in males (the sixth ray is thickened and greatly elongated). However the outer shape of the fins differed slightly among the specimens from the three localities. Body depth also differed between the specimens from Indonesia (12.0 % SL in male, 10.4 % in female) and those of the Philippines (12.2–14.1 % SL in males, 11.3–13.5 % in females). These morphological variations suggest that several cryptic species may be present with *Z. dunckeri*. However, we tentatively treated them as a single species due to the uncertain taxonomic status of *Z. dunckeri*. Redescription with lectotype designation for “*Zenarchopterus dunckeri*” is necessary to establish the taxonomic status of these cryptic species.

ZUMT 31853: female, 86.3; **ZUMT 31854:** male, 94.9, Sulawesi Tenggara: Buton I., Indonesia [“Buton, Celebes in Nan-yo (南洋)” in ZUMT specimen ledger], during Sept. 1935 to Jan. 1936, Ryoji Wada (和田遼二).

Description: Dorsal-fin rays 10; anal-fin rays 12; vertebrae 39 (27–28 + 11–12); anterior two dorsal-fin ray origins anterior to anal fin origin; fourth dorsal-fin ray of male elongated and thickened, distal tip of fourth dorsal-fin ray flat and wider than the rest of the ray; head length 26.2–27.7 % SL, body depth at anal-fin origin 10.4–12.0 % SL.

ZUMT 51984, 51989, 51994, 51995, 51997–52000, 52032, 52033, 52037, 52038: 12 males, 67.2–90.1; **ZUMT 51977, 51983, 51988, 51990–51993, 52030, 52031, 52034–52036:** 12 females, 62.8–85.5, Sea of Philippines, Jan. 1936–1937, Yaeko Yamamura (山村八重子) [1938, Umejiro Yamamura (山村樞次郎) in ZUMT specimen ledger].

Description: Dorsal-fin rays 10–12; anal-fin rays 11–13; vertebrae 39–41 (27–29 + 11–13); anterior 1–3 dorsal fin rays anterior to anal fin origin; fourth dorsal-fin ray of male elongated and thickened, distal tip of fourth dorsal-fin ray pointed; head length 26.2–27.7 % SL, body depth at anal-fin origin 10.4–12.0 % SL.

Remarks: Although only the name of U. Yamamura was written on the ZUMT specimen ledger, he did not visit the Philippines after returning to Japan in 1926. The specimens should be collected by Y. Yamamura (daughter of U. Yamamura) who visited and collected many specimens from the Philippines during 1936–1937 (Koeda et al. 2022), and donated them to ZUMT by U. Yamamura in 1938.

ZUMT 52415: male, 53.0; **ZUMT 52416:** male, 58.7; **ZUMT 52417:** female, 58.7; **ZUMT 52418:** female, 48.6; **ZUMT 52419:** juvenile, 12.6, Miyara River, Ishigaki-jima I., Yaeyama Island, Ryukyu Archipelago, Japan.

Remarks: These specimens were reported as the first Japanese record of the species with new standard Japanese “Komochi-sayori” by Meguro (1972).

ZUMT 60010: juvenile, 49.4; **ZUMT 60011:** juvenile, 56.1; **ZUMT 60027,** juvenile, 32.6, Urauchi-gawa River, Iriomote-jima I., Yaeyama Islands, Ryukyu Archipelago, 16 Aug. 1989.

Zenarchopterus ectuntio (Hamilton, 1822)

ZUMT 62523 (former tag: P. 2325): male, 99.8; **ZUMT 62524** (P. 4438): female, 102.9; **ZUMT 62525** (P. 4437): male, 102.4, possibly around Sarawak in Borneo Island, donated from Sarawak Museum.

Description: Dorsal-fin rays 12; anal-fin rays 12; vertebrae 42–44 (30–31 + 12–13); anterior 3 or 4 dorsal fin ray origins anterior to anal fin origin.

Zenarchopterus pappenheimi Mohr, 1926

Remarks: All the specimens in ZUMT were also shared the following characteristics with specimens treated as *Zenarchopterus buffonis* (Valenciennes, 1847) in several previous studies (e.g. Collette 1974; Collette and Su 1985): anterior 3–5 dorsal-fin ray origins anterior to anal-fin origin; 12–13 anal-fin rays; 12 dorsal-fin rays; dorsal-fin rays in males without elongation; distinct dark stripe on the upper jaw; and no black spot on the caudal-fin base. However, Kottelat (2013) designated a lectotype of *Hemiramphus buffonis* as a female individual with a dark stripe on the upper jaw with 9 anal-fin rays, which is outside of the previous definition of “*Z. buffonis*” after Mohr (1926). Therefore, *Zenarchopterus buffonis* may be a junior synonym of *Z. beauforti* or *Z. striga*. The number of vertebrae in selected specimens (with asterisk after ZUMT tag): 41–42 (29–30 + 12–13).

ZUMT 62521* (P. 2166): male, 90.5; **ZUMT 62522*** (P. 2167): female, 75.0, possibly around Sarawak in Borneo Island, donated from Sarawak Museum.

ZUMT ABE 3382*: female, 92.1, Palau, 1936–1937, T. Abe.

ZUMT 51976, 51982, 51996, 52039: 4 males, 77.9–99.4; **ZUMT 51975, 51978–51981, 51985–51987:** 8 females, 91.6–102.9, Sea of Philippines, Jan. 1936–1937, Yaeko Yamamura.

Remarks: For the collection date and collector name see remarks of *Zenarchopterus* cf. *dunckeri*.

Zenarchopterus xiphophorus Mohr, 1934

ZUMT 62519 (P. 1965): male, 83.6; **ZUMT 62520** (P. 1967): female, 70.8, possibly collected around Sarawak in Borneo Island, donated from Sarawak Museum.

Description: Dorsal-fin rays 14; anal-fin rays 12–13; vertebrae 42–43 (29–31 + 12–13); anterior four anal fin ray origins anterior to dorsal fin origin in male, anterior three dorsal fin ray origins anterior to anal fin origin in female; fourth dorsal-fin ray of male elongated and thickened, distal tip of fourth dorsal-fin ray pointed.

Remarks: This species has ever recorded only from Sumatra Island in the original description (Mohr 1934; Collette 2004). Present specimens were possibly suggested newly distribution of the species from Borneo.

Zenarchopterus sp.

ZUMT 43184: male, 89.1; **ZUMT 43186:** male, 87.0; **ZUMT 43183:** female, 94.7; **ZUMT 43185:** female, 85.3; **ZUMT 63759:** juvenile, 48.9: Palau, probably 1937, received Jan. 1938, Yata Haneda (羽根田弥太)]; **ZUMT ABE 3374, 3389, 3418:** 3 females; 89.6–101.1, Palau, 1936–1937, T. Abe.

Description: Dorsal-fin rays 10–11; anal-fin rays 10–12; vertebrae 39 (28 + 11); anterior three dorsal fin ray origins anterior to anal fin origin; fourth dorsal-fin ray of male elongated and thickened, distal tip of fourth dorsal-fin ray pointed; sixth anal-fin ray elongated and thickened, seventh ray slightly widened but shorter than sixth; head length 26.4–29.2 % SL, body depth at anal-fin origin 10.8–12.8 % SL.

Remarks: Although the elongation of the sixth anal-fin ray in male specimens was similar to that in *Z. dunckeri*, these specimens were clearly distinguished *Z. dunckeri* by the small elongation of the sixth anal-fin ray, which did not reach beyond the third part of the caudal fin, even in the larger specimens (vs. reach over the half of caudal fin in *Z. cf. dunckeri*: Fig. 1a, b).

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References

- Anderson, W. D. and Collette, B. B. 1991. Revision of the freshwater viviparous halfbeaks of the genus *Hemirhamphodon* (Teleostei: Hemiramphidae). *Ichthyological Exploration of Freshwaters*, 2 (2): 151–176.
- Collette, B. B. 1982. Two new species of freshwater halfbeaks (Pisces: Hemiramphidae) of the genus *Zenarchopterus* from New Guinea. *Copeia*, 1982 (2): 265–276.
- Collette, B. B. 1974. The garfishes (Hemiramphidae) of Australia and New Zealand. *Records of the Australian Museum* 29 (2): 11–105.
- Collette, B. B. 2004. Family Hemiramphidae Gill 1859 — halfbeaks. *Annotated Checklists of Fishes*, 22: 1–35.
- Collette, B. B. and Su, J. 1986. The halfbeaks (Pisces, Beloniformes, Hemiramphidae) of the far east. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 138 (1): 250–302.
- Kobayashi, H., Masengi, K. W. A. and Yamahira, K. 2020. A new “beakless” halfbeak of the genus *Nomorhamphus* from Sulawesi (Teleostei: Zenarchopteridae). *Copeia*, 108 (3): 522–531.
- Koeda, K., Hata, H., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. History of the fish collection of the Department of Zoology, The University Museum, The University of Tokyo. *The University Museum, The University of Tokyo Material Reports*, 129: 1–24. (In Japanese)
- Kottelat, M. 2013. The fishes of the inland waters of Southeast Asia: a catalogue and core bibliography of the fishes known to occur in freshwaters, mangroves and estuaries. *The Raffles Bulletin of Zoology, Supplement*, 27: 1–663.
- Lovejoy, N. R., Iranpour, M. and Collette, B. B. 2004. Phylogeny and jaw ontogeny of beloniform fishes. *Integrative and Comparative Biology*, 44: 366–377.
- Meguro, K. 1972. Northernmost record of the ovoviviparous halfbeak, genus *Zenarchopterus*, from Okinawa Prefecture, Japan, with some morphological notes. *Japanese Journal of Ichthyology*, 19 (3): 186–190.
- Meisner, A. D. 2001. Phylogenetic systematics of the viviparous halfbeak genera *Dermogenys* and *Nomorhamphus* (Teleostei: Hemiramphidae: Zenarchopterinae). *Zoological Journal of the Linnean Society*, 133: 199–283.
- Mohr, E. 1926. Die Gattung *Zenarchopterus* Gill. *Zoologische Jahrbücher, Abteilung für Systematik, Geographie und Biologie der Tiere (Jena)*, 52: 231–266.
- Mohr, E. 1934. *Zenarchopterus*-Studien. *Zoologische Mededeelingen (Leiden)*, 17 (1–2): 11–14.
- Nelson, J. S., Grande, T. C. and Wilson, M. V. 2016. *Fishes of the World*, 5th Edition. John Wiley & Sons, New York. 752 pp.
- Tan, H. H. and Lim, K. K. 2013. Three New Species of Freshwater Halfbeaks (Teleostei: Zenarchopteridae: *Hemirhamphodon*) from Borneo. *Raffles Bulletin of Zoology*, 61(2): 735–747.



Figure 1. Specimens of Zenarchopteridae deposited in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT). (a, b) *Zenarchopterus* cf. *dunckeri* [a: ZUMT 31854, male, 94.9 mm standard length (SL); Buton Island, Indonesia; b: ZUMT 51984, male, 88.9 mm SL; Philippines]; (c) *Z. ectuntio* [ZUMT 62525, male, 102.4 mm SL; probably collected from Sarawak, Malaysia]; (d, e) *Z. pappenheimi* [d: ZUMT 51976, male, 94.3 mm SL; e: ZUMT 51979, female, 95.6 mm SL; Philippines]; (f) *Z. xiphophorus* [ZUMT 62519, male, 83.6 mm SL; probably collected from Sarawak, Malaysia]; (g) *Zenarchopterus* sp. [ZUMT 43184, male, 89.1 mm SL; Palau]; (h) *Dermogenys* cf. *orientalis* [ZUMT 62424, 1 of 9 females, 53.8 mm SL; collection locality unknown]

Report on the specimens of the family Butidae (Teleostei: Gobiiformes) in the Department of Zoology, the University Museum, the University of Tokyo

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Abstract

During a detailed investigation of the collection of Butidae (Teleostei: Gobiiformes) deposited in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT), 47 specimens in four genera of seven species with an unidentified species, including some bearing the Japanese name of *Butis butis* (Hamilton, 1822) and *Bostrychus sinensis* La Cèpède, 1801, were found. No types are known for this family in ZUMT collection. We also confirmed the first reported *Bo. sinensis* specimen in Japan by Kuroiwa (1927), which was later transferred to Field Museum of Natural History, Chicago (FMNH).

Introduction

The family Butidae (Gobiiformes) includes about 10 genera and 46 species inhabiting the inland water of Indo-Pacific and Western Africa (Nelson et al. 2016), and is characterized by unfused pelvic fins, developed cephalic canal pores, position of mandibular telson position, and procurrent cartilages (Hoese and Gill 1993; Akihito et al. 2013). Three species, *Butis amboinensis* (Bleeker, 1854), *Bostrychus sinensis* La Cèpède, 1801, and *Ophiocara ophicephalus* (Valenciennes in Cuvier & Valenciennes, 1837), were recorded from Japan, and most of them recorded only from the Ryukyu Archipelago (Akihito et al. 2013).

In the Department of Zoology, The University Museum, The University of Tokyo (abbreviated as ZUMT), several butid specimens are historically important in Japanese ichthyology such as the first Japanese record of species, specimens bearing standard Japanese name. However, details of these specimens have not demonstrated.

In this study, we listed the butid gudgeon specimens in the ZUMT with an updated taxonomic status and identified the specimens used to propose Japanese names for *Bu. butis* (Hamilton, 1822) and *Bo. sinensis*. We also noted the current deposition of *Bo. sinensis* that was first discovered from Japan.

Materials and Methods

Specimens of Butidae in ZUMT were identified using following reference and unpublished data by HK: *Butis*: Kottelat et al. (1993); *Bostrychus*: Hoese and Kottelat (2005); *Ophiocara*: Keith and Mennesson (2021); *Oxyeleotris*: Koumans (1953). The synonymy and notation of valid names were assigned following Kottelat (2013).

Contents included in the list following registration numbers as follows: specimen counts (if plural specimens included in the lot), sex (if possible to identify from the shape of urogenital papilla); standard length (in mm), collection locality, collection date, collector. Collection data of the specimens are omitted if it matches the immediately following specimen. The collection year and collector for some specimens was estimated by following Koeda et al. (2022). Catalog numbers after ZUMT 62000 are newly given during this study.

Although, some of the ZUMT specimens collected by Dr. Abe had not been formally cataloged into the ZUMT collection (and the data of some specimens not retained), such specimens which can recognize by having underbar with the number on the accompanying label, are listed herein with the number ZUMT ABE XXXX, due to the possibility of future discovery of Dr. Abe's remaining catalog books with collection data. ZUMT-ABE 2700–6000 are recognized as which collected from Palau in 1936–1937 (Koeda et al. 2022).

Collection of Butidae in ZUMT

At least 48 specimens in 4 genera, 7 species, were found in the ZUMT fish collection. No types are known for this family in the collection. Some specimens were considered as undescribed species (see remarks). One specimen of *Bo. sinensis* (ZUMT 8850: the first Japanese specimen of the species) was transferred to another museum (see remarks). Three specimens of *Bo. sinensis* (ZUMT 58296 and ZUMT 60037, from Iriomote-jima I.; and ZUMT 60653 from Ishigaki-jima I., Japan) and a specimen of *Op. ophicephalus* (ZUMT 58053 from Iriomote-jima I., Japan) were not found during the present investigation.

Butidae ノコギリハゼ科

Butis Bleeker, 1856 ノコギリハゼ属

Butis butis (Hamilton, 1822) ノコギリハゼ

Remarks: The Japanese name of this species “Nokogiri-haze (ノコギリハゼ)” was proposed by Tomiyama (1936) based on three specimens (60–100 mm in total length) collected from the Philippines. Although the specimens were collected before 1936, they included both *Bu. butis* and *Bu. amboinensis*. The author pointed out that “*Butis amboinensis* has no accessory scales” and illustrated *Bu. butis* based on a large specimen (about 100 mm in total length), with small accessory scales at the base of the trunk scales. Therefore, we identified two candidates, ZUMT 11141 and ZUMT 31009, sharing these characteristics as bearing the Japanese name.

[Palau]

ZUMT 37815: female, 60.2, during Oct. 1936 to Mar. 1937, T. Abe.

[Philippines]

ZUMT 11141: male, 79.5, possibly 1920's, Umejiro Yamamura (山村樸次郎).

ZUMT 31009: male, 81.4, 1926, U. Yamamura.

ZUMT 42097: female, 49.1, 1936–1937, Yaeko Yamamura (山村八重子) [Jan. 1938, Umejiro Yamamura (山村樸次郎) in ZUMT specimen ledger].

Remarks: Although only the name of U. Yamamura was written on the ZUMT specimen ledger, he did not visited the Philippines after he returning to Japan in 1926. The specimens should be collected by Y. Yamamura (daughter of U. Yamamura) who visited and collected many specimens from the Philippines during 1936–1937 (Koeda et al. 2022), and donated them to ZUMT by U. Yamamura in 1938.

[West Pacific]

ZUMT 31709: male, 85.6, locality details unknown [Nan-yo (南洋) in ZUMT specimen ledger], before 1936.

Remarks: “Nan-yo (南洋)” in this period in ZUMT means West Pacific including Micronesian Islands to Southeast Asia and excluding Korea, China, and Taiwan.

[Locality unknown]

ZUMT 63385: male, 96.7, localities and dates unknown.

Remarks: This specimen contained in unlabeled lot with *Eleotris acanthopoma* Bleeker, 1853, and a Gobiidae gen. sp. with iron tags. Former tag of ZUMT 63385 is “2263”.

Butis amboinensis (Bleeker, 1854) ヤエヤマノコギリハゼ

[Palau]

ZUMT 37814: male, 56.3, during Oct. 1936 to Mar. 1937, T. Abe.

[Philippines]

ZUMT 31010: male, 50.0; ZUMT 31011: male, 45.8, 1926, coll. U. Yamamura.

ZUMT 42090–42096, ZUMT 42098–42100, ZUMT 42105: 12, 6 males and 6 females, 33.7–59.9, 1936–1937, Yaeko Yamamura.

Remarks: For the collection date and collector name, see remarks of *Butis butis*.

Bostrychus La Cepède, 1801 ジャノメハゼ属

Bostrychus sinensis La Cepède, 1801 ジャノメハゼ

Fig. 1a, b

Remarks: Following Chinese specimens in the ZUMT collection were observed by Tomiyama (1936) and he proposed a standard Japanese name of the species “Zyanome-haze (ジャノメハゼ)” (Akihito et al. 2013). A single specimen (ZUMT 8850), the first Japanese record of *Bo. sinensis*, collected by Hisashi Kuroiwa (黒岩 恒) from Ishigaki-jima Island in Japan, was not

found in the present investigation. However, it was discovered that the specimen was initially transferred to Carnegie Museum, Pittsburgh, USA (CM 8318: Jordan and Tanaka 1972), and finally deposited in the Field Museum of Natural History, Chicago, USA (FMNH 59175, 116.8 mm SL: Fig. 1b). Mr. Kuroiwa proposed another Japanese name “Iwasaki-haze (イワサキハゼ)” for the species (Kuroiwa 1927), but this name has never been used in other studies.

[China]

ZUMT 18009: 118.2, Shanghai Market (上海市場), Tamiji Kawamura (川村多實二).

ZUMT 21219: 178.0; ZUMT 21220: 113.5, Shanghai, Kurami Narita (成田蔵巳).

Remarks: ZUMT 18009 was transferred from the Otsu Hydrobiological Station, Kyoto University, Japan (recently called as Center for Ecological Research, Kyoto University) by Denzaburo Miyadi (宮地傳三郎). Although no information of the sample collection date was noted in the ZUMT specimen ledger, two specimens, possibly as an original lot (FAKU-P 258), were collected from the same locality on 10 Dec. 1915 by T. Kawamura (川村多實二), and stored in Kyoto University Museum (HK, personal observation).

ZUMT 30142: 140.1; ZUMT 30143: 132.1, Hainan Island, Guangdong Province, Qing dynasty (清国, 広東省, 海南島), Oct. 1906, Ichigoro Katsude (勝出市五郎).

[Japan]

ZUMT 58009: 79.9, Nakama-gawa River (仲間川), Iriomote-jima I., Yaeyama Islands, Ryukyu Archipelago, 7 July 1988, H. Senou and M. Aizawa

ZUMT 58293: 87.1; ZUMT 58294: 91.2; ZUMT 58295: 111.0; ZUMT 58297: 52.7, Yonada-gawa River (与那田川), Iriomote-jima I., Yaeyama Islands, Ryukyu Archipelago, 13 July 1988, H. Senou and M. Aizawa

ZUMT 60035: 103.0; ZUMT 60038: 93.9; ZUMT 60039: 115.1, Yonada-gawa River, 17 Aug. 1989.

ZUMT 60125: 33.2; ZUMT 60126: 41.1, Yonada-gawa River, 18 Aug. 1989.

Ophiocara Gill, 1863 ホシマダラハゼ属

Ophiocara ophicephalus (Valenciennes, 1837) ホシマダラハゼ

Remarks: We treated specimens with “silver dotted pattern” in Keith and Mennesson (2021) as *O. ophicephalus*.

[Palau]

ZUMT 37767: female, 148.8, Palau, during Oct. 1936 to Mar. 1937, T. Abe.

ZUMT-ABE 3091: juvenile, 52.9, 1936–1937, T. Abe.

[Philippines]

ZUMT 48524: 97.3, Basilan, 1926, U. Yamamura.

ZUMT 11112: male, 146.6, Philippines, possibly 1920's, U. Yamamura.

[Japan]

ZUMT 58052: female, 174.0, Nakama-gawa River, Iriomote-jima I., Yaeyama Islands, Ryukyu Archipelago, 9 Jul. 1988, H. Senou and M. Aizawa.

ZUMT 60727: male, 169.0, Sukuji-gawa River (底地川), Ishigaki-jima I., Yaeyama Islands, Ryukyu Archipelago, 29 Aug. 1989.

Ophiocara* cf. *ophicephalus

Fig. 1c

Remarks: Following specimens may be an undescribed species. This species is distinguished from *Op. ophicephalus* by the color pattern and arrangement of the ctenoid scale (currently under study by HK).

[Philippines]

ZUMT 55323: male, 205.0, Manila, Luzon I., Philippines, Aug. 1922, Yata Haneda (羽根田弥太).

[Palau]

ZUMT-ABE 3129: male, 221.2; ZUMT-ABE 3130: female, 220.5, 1936–1937, T. Abe.

Ophiocara* cf. *cantoris

Fig. 1d

[Singapore]

ZUMT 40749: 92.2, Singapore, 12 Mar. 1910, Isao Iijima (飯島 魁) and Kumakichi Aoki (青木熊吉).

Remarks: The observed specimen shared the trunk melanophore patterns with *Op. cantoris* (Günther, 1861) figured in Keith and Mennesson (2021). However, the number of predorsal scales of the specimen was fewer than that of *Op. cantoris* (21 vs. 25–27 in *Op. cantoris*; Keith and Mennesson 2021).

***Ophiocara* sp.**

[?South Africa]

ZUMT 55238: juvenile, 36.2; ZUMT 55239: juvenile, 39.2, questionably from South Africa (paper tag written as “Nyara rpo.?”).

Remarks: “Nyara” may be local place in Eastern Cape region in South Africa. However, this species was collected together with *Stenogobius* sp. and *Hypseleotris cyprinoides*, which usually inhabit waters in the Western Pacific Region. Identification of the specimens is pending due to the poor condition and uncertain locality of them.

Oxyeleotris Bleeker, 1874
Oxyeleotris urophthalmus (Bleeker, 1851)

Fig. 1e

[Singapore]

ZUMT 40748: 96.8, possibly female, Singapore, 12 Mar. 1910, coll. I. Iijima and K. Aoki.

Remarks: *Oxyeleotris urophthalmus* resembles *Bo. sinensis* and *Odonteleotris macrodon* (Bleeker, 1853) in having a large number of lateral cycloid scales and elongated body. However, this species can be clearly distinguished from former by not having vomerine teeth (vs. with vomerine teeth in *Bo. sinensis*: Larson, 2008) and from the latter by having single interorbital canal pore (vs. divided in *Od. macrodon*: personal observation of HK)

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References

- Akihito, Sakamoto, K., Ikeda, Y. and Aizawa, M. 2013. Gobioidae. Pp. 1347–1608, 2109–2211. In: Nakabo, T. (ed) Fishes of Japan with pictorial keys to the species, third edition. Tokai University Press, Hadano. (In Japanese)
- Hoese, D. F. and Gill, A. 1993. Phylogenetic relationships of eleotridid fishes (Perciformes: Gobioidae). *Bulletin of Marine Science*, 52 (1): 415–440.
- Hoese, D. F. and Kottelat, M. 2005. *Bostrychus microphthalmus*, a new microphthalmic cavefish from Sulawesi (Teleostei: Gobiidae). *Ichthyological Exploration of Freshwaters*, 16 (2): 183–191.
- Jordan, D. S. and Tanaka, S. 1927. The fresh-water fishes of the Riukiu Islands, Japan. *Annals of the Carnegie Museum*, 17 (2): 259–278, pls. 22–23.
- Keith, P. and Mennesson, M. 2021. Review of *Ophiocara* (Teleostei: Butidae) from Indo-Pacific Islands. *Cybium*, 45 (2): 89–108.
- Koeda, K., Hata, H., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. History of the fish collection of the Department of Zoology, The University Museum, The University of Tokyo. *The University Museum, The University of Tokyo Material Reports*, 129: 1–24. (In Japanese)

- Kottelat, M. 2013. The fishes of the inland waters of Southeast Asia: a catalogue and core bibliography of the fishes known to occur in freshwaters, mangroves and estuaries. *The Raffles Bulletin of Zoology, Supplement*, 27: 1–663.
- Kottelat, M., Whitten, T., Kartikasari, S. N. and Wirjoatmodjo, S. 1993. Freshwater fishes of Western Indonesia and Sulawesi. Periplus Editions, Hong Kong. 344 pp.
- Koumans, F. P. 1953. Gobioidae. *The fishes of the Indo-Australian archipelago*, 10: 1–423.
- Kuroiwa, H. 1927. Catalogue of Fresh Water Fishes Collected in Liukiu Curve, 1912–1925. *Zoological Magazine*, 39: 355–368. (In Japanese)
- Nelson, J. S., Grande, T. C. and Wilson, M. V. 2016. *Fishes of the World*, 5th Edition. John Wiley & Sons, New York. 752 pp.
- Tomiyama, I. 1936. Gobiidae of Japan. *Japanese Journal of Zoology*, 7: 37–112.

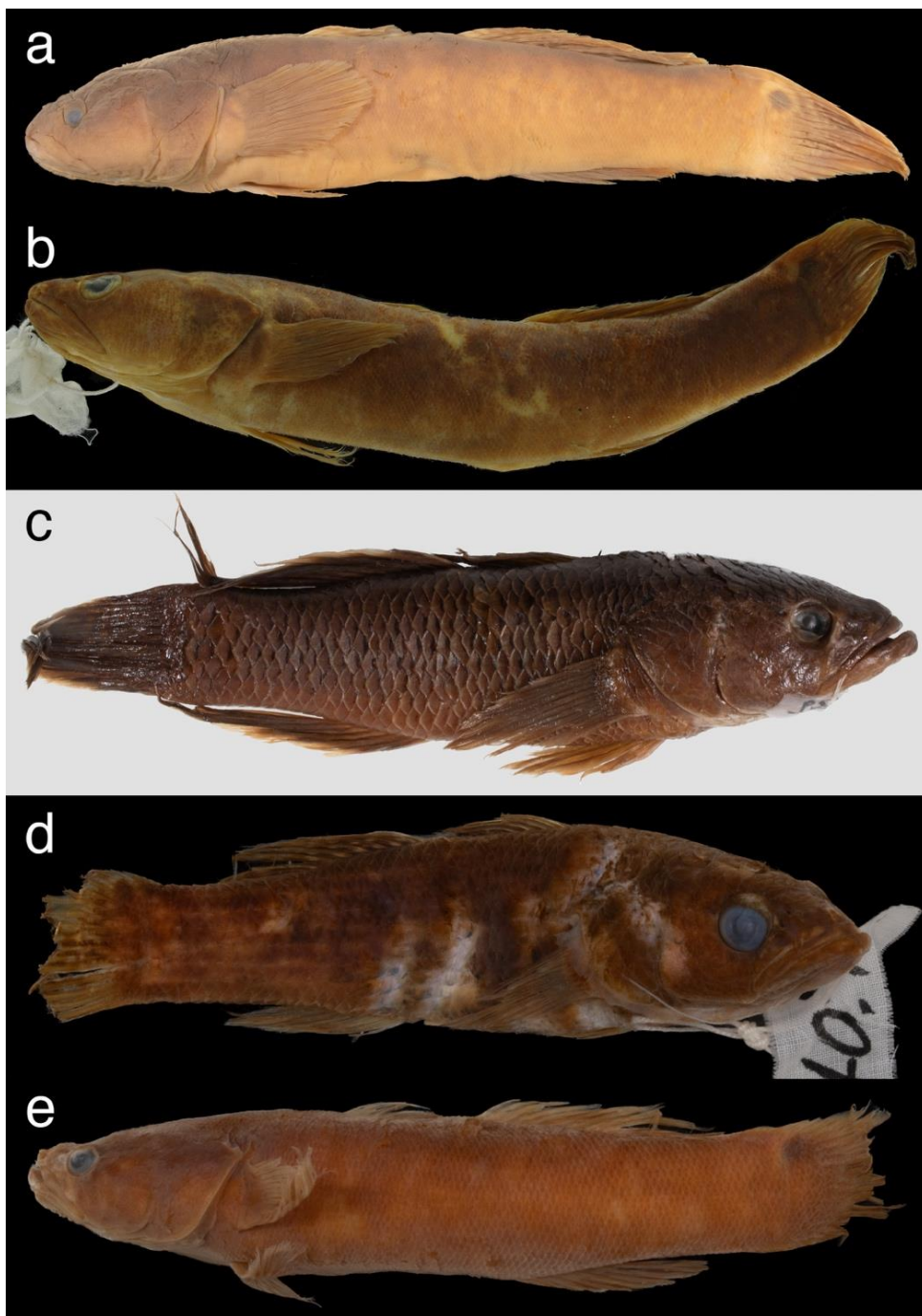


Figure 1. Specimens of Butidae deposited in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT). (a, b) *Bostrychus sinensis* [a: ZUMT 21219, 178.0 mm standard length (SL); Shanghai Market, China; b: FMNH 59175 (former ZUMT 8850) 116.8 mm SL, Ishigaki-jima Island, Japan]; (c) *Ophiocara* cf. *ophicephalus* [ZUMT-ABE 3129, male, 221.2 mm SL; Palau]; (d) *Ophiocara* cf. *cantoris* [ZUMT 40479, 92.2 mm SL, Singapore]; (e) *Oxyeleotris urophthalmus* [ZUMT 40748, 96.8 mm SL, Singapore].

List of specimens of the families Ariommatidae, Centrolophidae, Nomeidae, Stromateidae, and Tetragonuridae (Actinopterygii: Teleostei) deposited in the Department of Zoology, The University Museum, The University of Tokyo

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Abstract

Two hundred and twenty-eight specimens of 21 species, representing the families Ariommatidae, Centrolophidae, Nomeidae, Stromateidae, and Tetragonuridae, were found in the Department of Zoology, The University Museum, The University of Tokyo. Held in 216 lots, the specimens included a paratype of *Psenes kamoharai* Abe, Kojima & Kosakai, 1963 and the holotype of *Tetragonurus pacificus* Abe, 1953. However, no ZUMT specimens or ZUMT ledger registrations of examples of the family Amarsipidae were found.

Introduction

Stromateoidei, a suborder of Perciformes including six families (Amarsipidae, Ariommatidae, Centrolophidae, Nomeidae, Stromateidae, Tetragonuridae) (Haedrich 1967, 2002a–e; Haedrich and Horn 1972; Last 2001a–f; Nakabo and Doiuchi 2013a–e), has recently been questioned by phylogenetic studies that indicated that such families were better placed in Scombriformes (Series Pelagiaria) together with several other families, such as Bramidae, Scombrolabracidae, Scombridae, and Gempylidae (Miya et al. 2013; Betancur-R. 2017), with which they had not previously been considered closely related. Moreover, recent molecular phylogenetic studies have also shown that Centrolophidae, Amarsipidae and Tetragonuridae are, in fact, sister groups of Scombrolabracidae and Chiasmodontidae, respectively, not of other three families included in Stromateoidei (Miya et al. 2013; Betancur-R. 2017; Harrington et al. 2021).

Many species of families previously included in Stromateoidei are known to change their body and coloration significantly with growth (Suda et al. 1986; Hata and Motomura 2018; Cabebe and Motomura 2019; Wada 2019). In particular, juveniles of many species of Centrolophidae and Nomeidae are often associated with floating objects, including jellyfishes and drifting seaweeds (Kato 1933; Daniel 1973; Jenkins 1983; Kagoshima City Aquarium Foundation 2008, 2018; Yoshino 2008). Although adults of most of the species, including Amarsipidae and Tetragonuridae, are thought to inhabit mid-water or deep sea bottom habitats, biological information on feeding and

habitat use, as well as accurate distribution of many of them are very poorly known due to their apparent rarity (Okamura 1997; Hata et al. 2016; Koeda and Teramura 2019). Some genera are also taxonomically confused (Nakabo and Doiuchi 2013b) and in need of revision.

On the other hand, some species of Centrolophidae and Stromateidae are abundantly caught and used as food (Yamada 1986a, b; Haedrich 2002c, e; Okamoto et al. 2011; Matsunuma and Okamoto 2015; Koeda 2019; Hata 2020). In particular, species of the genus *Pampus* are highly priced in China and western Japan (Yamada 1986c; Nakabo and Doiuchi 2013c; Last 2001f; Hata 2022).

Specimens of families previously included in Stromateoidei, deposited in the Department of Zoology, The University Museum, The University of Tokyo, include 3, 2, 5, 6, and 2 species of Ariommatidae, Centrolophidae, Nomeidae, Stromateidae, and Tetragonuridae, respectively. A paratype of *Psenes kamoharai* Abe, Kojima & Kosakai, 1963 and the holotype of *Tetragonurus pacificus* Abe, 1953 were also confirmed. However, no ZUMT specimens or ZUMT ledger registrations of examples of Amarsipidae were found.

Materials and Methods

Specimens held in the Department of Zoology, The University Museum, The University of Tokyo (abbreviated as ZUMT) and included in the present list, were identified following Haedrich (1967, 2002a–e), Haedrich and Horn (1972), Last (2001a–f), and Nakabo and Doiuchi (2013a–e). Parentheses following registration numbers include specimen numbers (if plural specimens were included in the lot), standard length, collection locality, collection date, and collector, plus type status (if applicable). Collection data of specimens are omitted if the same as that for the previous specimen. The collection year and collector for some specimens were estimated following Koeda et al. (2022).

The ZUMT specimens listed in this study were stored in room 407 in the museum building. Most were stored in shelved containers, although some larger specimens of *Hyperoglyphe japonica* (Döderlein, 1884) and all specimens of *Tetragonurus cuvieri* Risso, 1810 were stored in glass tanks labelled as “Centrolophidae” and “Tetragonuridae”, respectively, in the same room, with the glass lid sealed with a silicon adhesive (as of Mar. 2022). Although some of the ZUMT specimens, collected by Dr. Tokiharu Abe, had not been registered into the ZUMT collection, with collection data of most missing, they are listed herein together with their ZUMT ABE number (underlined number written on the label), in the hope that Dr. Abe’s catalog books with collection data will be rediscovered in the future. Additionally, specimens with catalogue numbers ZUMT ABE 2700 to 6000 were collected from Palau by Dr. Abe between 1936 and 1937 (Koeda et al. 2022).

Results

The ZUMT fish collection was confirmed as including specimens of Ariommatidae (9 lots including 9 specimens representing 3 species), Centrolophidae (117 lots, 120 specimens, 4 species), Nomeidae (58 lots, 60 specimens, 6 species, including a paratype of *Psenes kamoharai* Abe, Kojima & Kosakai, 1963), Stromateidae (32 lots, 39 specimens, 6 species), and Tetragonuridae (9 lots, 9 specimens, 2 species, including the holotype of *Tetragonurus pacificus* Abe, 1953). No ZUMT specimens or ZUMT ledger registrations of examples of Amarsipidae were found.

Although Abe (1959) reported *Cubiceps pauciradiatus* Günther, 1872 (ホソオキメダイ) based on 2 specimens [one specimen (standard length 120mm) registered as ZUMT ABE '57-347, collected from Manazuru, Kanagawa Pref., Japan between December 15 and 10 July 1958; and a second (standard length 80 mm) labelled as “tentative no. ABE 10832” (also as Cat. No. KAMOHARA 6759), collected from Kochi Pref., Japan in early 1957], such specimens or others identified as the above species were not found in the ZUMT fish collection. Abe (1955) also reported *Cubiceps gracilis* (Lowe, 1843), based on six specimens [ABE 10155, collected from ca. 340–370 km southeast of Inubo Point, Chiba Pref. (33°30'N, 143°30'E–144°00'E) on Dec. 1954; ABE 10169 (Pacific Ocean, in early Jan. 1955); ABE 10173, collected from ca. 50–100 km southeast of Aoga-shima Island, Izu Islands (32°10'N–32°11'N, 140°10'E–140°50'E) on 1 Feb. 1955; ABE 10178 (50 miles southeast of Tori-shima Island, Zunan Islands) in mid. Feb. 1955; ABE 10179 (no data); and a single individual (not preserved) from between the Hawaiian Islands and Midway Atoll between 21 Dec. 1954 and 16 Jan. 1955]. However, neither these specimens nor others identified as *C. gracilis* were found.

Species accounts

Family Centrolophidae イボダイ科

Hyperoglyphe japonica (Döderlein, 1884) メダイ

JAPAN

CHIBA PREF.

ZUMT 38639 (291.2 mm; Katsuura City)

TOKYO MARKET

ZUMT 12755 (167.7 mm), ZUMT 12756 (170.6 mm), ZUMT 12757 (113.4 mm), ZUMT 12767 (162.0 mm), ZUMT 12768 (180.7 mm), ZUMT 12769 (163.7 mm; obtained at Tokyo Market, Tokyo Met.)

KANAGAWA PREF.

ZUMT 51902 (101.8 mm), ZUMT 51903 (110.6 mm; Koajiro, Aburatsubo, Misaki, Miura City; 31 May 1960)

ZUMT 51904 [36.5 mm; Moroiso, Misaki, Miura City (following drifting jellyfish); 6 Mar. 1960]

ZUMT 63043 (89.1 mm), ZUMT 63044 (84.2 mm), ZUMT 63045 (80.1 mm; Manazuru Town)
ZUMT ABE 61-119 (4, 37.6–64.9 mm), ZUMT ABE 61-546 (58.3 mm), ZUMT ABE 61-547 (53.1 mm; Manazuru Town; coll. between 26 Dec. 1960 and 1 Apr. 1961)

SHIZUOKA PREF.

ZUMT 33378 (80.5 mm), ZUMT 33384 (183.7 mm; Shizuoka Pref.)

WAKAYAMA PREF.

ZUMT ABE 8995 (102.2 mm), ZUMT ABE 8996 (88.1 mm), ZUMT ABE 8997 (65.6 mm; off Osaki, Shimotsu, Kainan City; May 1953)

ZUMT ABE 9058 [68.8 mm+ (head broken); off Osaki, Shimotsu, Kainan City; Apr. 1953]

TOKUSHIMA PREF.

ZUMT 26550 (242.7 mm; Oshima Island, Mugi Town)

LOCALITY UNKNOWN

ZUMT 12110 (215.0 mm), ZUMT 62929 (422.5 mm), ZUMT 62930 (434.0 mm), ZUMT 62931 (361.3 mm), ZUMT 63430 (91.3 mm), ZUMT ABE 8703 (256.8 mm), ZUMT ABE 14109 (289.3 mm), ZUMT ABE 59-134 (69.9 mm), ZUMT ABE 60-493 (37.5 mm), ZUMT ABE 60-494 (42.2 mm), ZUMT ABE 60-495 (31.7 mm), ZUMT ABE 60-942 (44.9 mm; no data)
ZUMT 64088 (290.4 mm; locality unknown; tagged as “・324”)

Icichthys lockingtoni Jordan & Gilbert 1880 クロメダイ

JAPAN

ZUMT 44697 (254.8 mm; probably collected from Ishikawa Pref., coll. by personnel of Ishikawa Prefectural Fisheries Experimental Station)

Remarks: *Icichthys lockingtoni* has been recorded only from the coast of the San-in District, facing the Japan Sea (Nakabo and Doiuchi 2013a), the present specimen therefore representing the first record of the species from Ishikawa Prefecture.

Psenopsis anomala (Temminck & Schlegel, 1844) イボダイ

JAPAN

IWATE PREF.

ZUMT 13067 (109.0 mm; Miyako Bay; coll. by S. Tanabe)

CHIBA PREF.

ZUMT 2806 [96.4 mm; probably collected from Chiba Pref.; donated from N. Yanagi (Takashima Experimental Station, Fisheries Training Center)]

ZUMT 40296 [47.7 mm; probably collected from Chiba Pref.; coll. by K. Furukawa (Katakai, Kujukuri Town)]

ZUMT 45338 (69.5 mm), ZUMT 45339 [35.5 mm; probably collected from Chiba Pref.; coll. by M. Yosezato (Naruto Junior High School)]

TOKYO MARKET

ZUMT 26400 (137.2 mm; obtained at Tokyo Market, Tokyo Met.; Oct. 1929)

KANAGAWA PREF.

ZUMT 34006 (63.9 mm), ZUMT 34007 (60.3 mm; Yokohama City or Ninomiya Town)

ZUMT 50510 (153.9 mm; Aburatsubo, Misaki, Miura City; 7 July 1959; coll. by Y. Tominaga)

ZUMT 62861 (81.4 mm), ZUMT 62862 (16.1 mm), ZUMT 62863 (74.8 mm), ZUMT 62864 [56.3 mm; off Misaki, Miura City (following Sand Jellyfish *Rhopilema hispidum*); 15 Sept. 1964]

ZUMT 62865 (62.2 mm), ZUMT 62866 (25.5 mm), ZUMT 62867 (50.7 mm), ZUMT 62868 (48.3 mm), ZUMT 62869 (42.2 mm), ZUMT 62870 [10.6 mm; off Misaki, Miura City (following Sand Jellyfish *Rhopilema hispidum*); 15 Sept. 1964]

ZUMT 63029 (171.4 mm), ZUMT 63030 (170.9 mm; Zaimokuza Beach, Kamakura City; 20 May 1932; coll. by T. Abe)

MIE PREF.

ZUMT 23352 (105.5 mm; Owase City; coll. by K. Nakahara)

HYOGO PREF.

ZUMT 2255 (132.7 mm; obtained at a fish market in Fukura, Awaji City, Awaji-shima Island; coll. by R. Uchiyama; 24 May 1909)

ZUMT 13471 (113.5 mm), ZUMT 13472 (124.0 mm; probably collected from Hyogo Pref.; coll. by personnel of Hyogo Branch of Japan Fisheries Association)

ZUMT 19358 (53.2 mm; Akashi Strait; Aug. 1928; coll. by T. Saito)

YAMAGUCHI PREF.

ZUMT 9882 (47.2 mm; Suo-oshima Island; coll. by T. Yamahara)

ZUMT 11427 (156.0 mm; off Shimonoseki City; coll. by T. Kumada)

ZUMT 25239 (104.1 mm; Yamaguchi Pref.; coll. by M. Nagatomi)

NIIGATA PREF.

ZUMT 23428 (131.5 mm; Niigata Pref.; coll. by K. Igarashi)

SHIMANE PREF.

ZUMT 31259 (175.1 mm; Matsue City)

EHIME PREF.

ZUMT 20107 [149.9 mm; probably collected from Ehime Pref.; coll. by K. Yamashita (Ozu Junior High School)]

KOCHI PREF.

ZUMT 18636 [125.8 mm; Kochi Pref. (obtained from a fish retailer in Nakasuka, Kochi City); 2 Nov. 1928; coll. by T. Kamohara]

FUKUOKA PREF.

ZUMT 17983 [79.8 mm; probably collected from Fukuoka Pref.; coll. by O. Kinoshita (Yanagawa Middle High School for Girls)]

ZUMT 18050 (129.9 mm), ZUMT 18051 (127.1 mm; Ariake Sea; coll. by personnel of Fukuoka Prefectural Fisheries Experimental Station)

ZUMT 19631 (160.8 mm; Genkai-nada Sea; coll. by T. Matsumoto)

ZUMT 35584 (106.6 mm), ZUMT 35585 (106.5 mm), ZUMT 35587 (101.4 mm), ZUMT 35588 (103.3 mm), ZUMT 35589 (86.9 mm), ZUMT 35590 (77.8 mm), ZUMT 35591 (94.1 mm), ZUMT 35592 (89.9 mm), ZUMT 35593 (81.3 mm), ZUMT 35594 (67.4 mm; Ariake Sea, off Okinohata, Yanagawa City; Oct. 1931)

ZUMT 49838 (150.8 mm; obtained at Fukuoka Fish Market; 28 July 1959)

ZUMT 50743 (107.3 mm), ZUMT 50744 (36.3 mm; Ariake Sea; 19 Apr. 1959)

SAGA PREF.

ZUMT 51891 (99.9 mm; obtained at Kashima Fish Market, Kashima City; 11 Aug. 1959)

NAGASAKI PREF.

ZUMT 2346 (140.8 mm; Nagasaki Pref.; 3 July 1909)

ZUMT 3828 (193.5 mm; south of Osezaki, Fukue-jima Island, Goto Islands; coll. by *FV Hayatori-maru*)

ZUMT 49955 [142.7 mm; Fukue, Goto City (Fukue-jima Island, Goto Islands); 10 June 1953; coll. by I. Tomiyama]

ZUMT 63086 (121.9 mm; Mogi, Nagasaki City)

KUMAMOTO PREF.

ZUMT 18299 (57.0 mm; probably collected from Kumamoto Pref.; coll. by personnel of Kumamoto Prefectural Fisheries Experimental Station)

PRECISE LOCALITY UNKNOWN

ZUMT 43301 (102.7 mm; no data; tagged as “深浦 38”)

EAST CHINA SEA

ZUMT 51119 (112.3 mm), ZUMT 51120 (74.2 mm), ZUMT 51148 (52.3 mm), ZUMT 51149 (48.9 mm; East China Sea; Dec. 1959)

ZUMT 51188 (108.0 mm), ZUMT 51189 (135.3 mm), ZUMT 51190 (66.6 mm), ZUMT 51191 (97.0 mm), ZUMT 51192 (121.4 mm), ZUMT 51193 (78.8 mm), ZUMT 51194 (73.2 mm), ZUMT 51725 (57.9 mm), ZUMT 51760 (125.1 mm; East China Sea)

CHINA

ZUMT 51454 [104.9 mm; East China Sea, east of Nantong, Jiangsu Province (32°35'N, 122°40'E)]

TAIWAN

ZUMT 19031 (154.2 mm; Keelung; coll. by H. Sato)

ZUMT 63031 (147.4 mm; Ximending Market, Taipei City; 17 Oct. 1929)

LOCALITY UNKNOWN

ZUMT 63028 (84.3 mm), ZUMT ABE 7766 (44.7 mm), ZUMT ABE 60-1551 (87.0 mm; no data)

ZUMT 63091 (171.2 mm; no data; tagged as “T-40”)

ZUMT ABE 62-260 (47.8 mm; no data; coll. in Apr. 1962)

***Tubbia tasmanica* Whitley, 1934**

NEW ZEALAND

ZUMT 64093 (358.1 mm; New Zealand; 4 Mar. 1983)

Family Nomeidae エボシダイ科

***Cubiceps baxteri* McCulloch, 1923 オキメダイ**

JAPAN

ZUMT 64094 (355.8 mm; Manazuru Town, Kanagawa Pref.)

ZUMT ABE 56-212 (294.7 mm; off Tori-shima Island, Zunan Islands; 1 Mar. 1931)

Cubiceps whiteleggii (Waite, 1894) ボウズコンニャク

JAPAN

ZUMT 23756 (140.7 mm), ZUMT 23761 (140.6 mm), ZUMT 23794 (138.0 mm; Taniyama, Kagoshima City, Kagoshima Pref.; 20 July 1930)

Nomeus gronovii (Gmelin, 1789) エボシダイ

JAPAN

ZUMT 5848 (94.8 mm; Joga-shima Island, Miura City, Kanagawa Pref.)
ZUMT 10176 (103.7 mm; probably collected from Shizuoka Pref.; coll. by personnel of Shizuoka Prefectural Fisheries Experimental Station)
ZUMT 39050 (129.0 mm; Onahama, Iwaki City, Fukushima Pref.)
ZUMT 39700 (70.9 mm), ZUMT 39701 (58.8 mm; Anegasaki, Ichihara City, Chiba Pref.)
ZUMT 40315 (3 specimens, 16.8–32.1 mm; Misaki, Miura City, Kanagawa Pref.)
ZUMT 42413 (31.3 mm; Shimoda City, Shizuoka Pref.; coll. by K. Kato)
ZUMT ABE 61-118 (54.6 mm; Manazuru Town, Kanagawa Pref.; coll. between 26 Dec. 1960 and 1 Apr. 1961)

LOCALITY UNKNOWN

ZUMT 60812 (33.5 mm), ZUMT 63041 (58.4 mm; no data)

Remarks. Suda et al. (1986) reported 15 examples of the species (including ZUMT 5848, 10176, 39700, and 39701) in detail.

Psenes arafurensis Günther, 1889 クラゲウオ

JAPAN

ZUMT 40600 (175.2 mm; Hakodate, Abashiri, or Sapporo, Hokkaido)
ZUMT 49133 (158.3 mm; Misaki, Miura City, Kanagawa Pref.; 1956; coll. by I. Tomiyama)
ZUMT 51905 (19.9 mm; Aburatsubo, Misaki, Miura City, Kanagawa Pref.; Mar. 1960; coll. by N. Isono)

LOCALITY UNKNOWN

ZUMT ABE 56-193 (46.1 mm; no data)

Remarks. Because the northern limit of the distributional range of *P. arafurensis* in the Pacific Ocean was previously believed to be Noto Town, Ishikawa Prefecture, Japan (Tsuji et al. 2010; Sakai, 2010; Nakabo and Doiuchi, 2013c; Lee et al., 2016), ZUMT 40600, collected from Hokkaido, represents the northernmost record of the species. However, the precise collection locality is unknown, the ledger indicating the collection locality to be either

Hakodate (southwestern Hokkaido, facing Tsugaru Strait), Abashiri (northeastern Hokkaido, facing the Okhotsk Sea), or Sapporo (western Hokkaido, the largest city in Hokkaido and not facing the sea). The ledger also stated that “no one knows the name of fish there”.

Psenes cyanophrys Valenciennes, 1833 スジハナビラウオ

JAPAN

ZUMT 51936 (133.8 mm; obtained at Nagasaki Fish Market; 12 Aug. 1960)
ZUMT 51937 (149.4 mm), ZUMT 51938 (137.9 mm), ZUMT 51939 (130.7 mm), ZUMT 51940 (157.0 mm; Urajiro, Nobeoka City, Miyazaki Pref.; 2 Aug. 1960)
ZUMT 52309 [185.0 mm; paratype of *Psenes kamoharai* Abe, Kojima & Kosakai, 1963; 40 miles (64 km ca.) northwest of Hamada City, Shimane Pref.; 20 Aug. 1963]

INDONESIA

ZUMT 48747 (21.3 mm), ZUMT 48750 [23.7 mm; Banda Sea (6°S, 130°E); late June 1956; coll. by I. Tomiyama]

KIRIBATI

ZUMT 48633 (38.9 mm), ZUMT 48634 (35.6 mm), ZUMT 48635 (27.7 mm), ZUMT 48636 (25.7 mm), ZUMT 48637 (26.1 mm), ZUMT 48638 (23.0 mm), ZUMT 48639 (23.6 mm), ZUMT 48640 (22.4 mm), ZUMT 48641 (20.7 mm), ZUMT 48642 (18.3 mm), ZUMT 48643 (20.4 mm), ZUMT 48644 (18.7 mm), ZUMT 48645 [18.0 mm; central Pacific, approx. 60 km southwest of Banaba (1°15'S, 169°09'E)]

LOCALITY UNKNOWN

ZUMT 62933 (108.6 mm), ZUMT 63026 (32.4 mm; no data)

Remarks. Abe et al. (1963) described the new species *Psenes kamoharai*, subsequently regarded by (Haedrich 1967) as a junior synonym of *P. cyanophrys*, and designated four specimens in Dr. Abe's collection as paratypes: one specimen with Zoological Institute, Faculty of Science of University of Tokyo catalogue number 52309 (the original description indicates that the specimen was tentatively registered as ABE '63-998), 185 mm in standard length, collected off Hamada, Shimane Pref., Japan, 20 Aug, 1963; one specimen with “tentative catalogue number” ABE '60-1961, 197 mm in standard length, collected off Hamada, Shimane Pref., 31 July, 1960; one specimen with “tentative catalogue number” ABE '60-1962, 194 mm in standard length, collected off Hamada, Shimane Pref., 23 Aug. 1960; and one specimen labelled as ABE '58-235 (specimen-number not shown as “tentative catalogue number”), 126 mm in standard length, collected from Manazuru, Kanagawa Pref., Japan in 1958. However, no paratype specimens [except for ZUMT 52309 (shown as ABE '63-998 in the original description)] were found.

Psenes pellucidus Lütken, 1880 ハナビラウオ

JAPAN

ZUMT ABE 8704 (135.8 mm; Kesenuma City, Miyagi Pref.; Aug. 1952)

ZUMT ABE 9587 (143.1 mm; Kubota Beach, Nagaura, Sodegaura City, Chiba Pref.; 12 Oct. 1953; coll. by K. Sugawara)

ZUMT ABE 61-117 (43.2 mm; Manazuru Town, Kanagawa Pref.; coll. between 26 Dec. 1960 and 1 Apr. 1961)

ZUMT ABE 61-543 (66.6 mm), ZUMT ABE 61-544 (71.9 mm), ZUMT ABE 61-545 (53.4 mm; Manazuru Town, Kanagawa Pref.; coll. between 2 Apr. 1961 and 20 June 1961)

ZUMT ABE 62-14 (92.8 mm), ZUMT ABE 62-15 (89.8 mm), ZUMT ABE 62-16 (101.5 mm; Manazuru Town, Kanagawa Pref.; coll. between Jan. 1962 and 12 Feb. 1962)

LOCALITY UNKNOWN

ZUMT 63033 (90.0 mm; no data; tagged as “マ 53”)

ZUMT 64089 (289.1 mm; no data; tagged as “・ 352”)

ZUMT ABE 58-123 (126.5 mm), ZUMT ABE 59-38 (112.2 mm), ZUMT ABE 59-137 (136.5 mm), ZUMT ABE 60-34 (92.6 mm), ZUMT ABE 60-38 (86.8 mm; no data)

Family Stromateidae マナガツオ科

***Pampus argenteus* (Euphrasen, 1788)**

PALAU

ZUMT 63036 (31.8 mm; Palau; separated from ZUMT ABE 4301)

INDONESIA

ZUMT 42132 (82.2 mm; Jakarta, Java; 5 Mar. 1909; I. Iijima and K. Aoki)

***Pampus chinensis* (Euphrasen, 1788) シナマナガツオ**

JAPAN

ZUMT 54575 (94.1 mm; Toyama Pref.)

***Pampus cinereus* (Bloch, 1795) ヒレナガマナガツオ**

JAPAN

ZUMT 44208 [162.9 mm; probably obtained at Tokyo Market, Tokyo Met.; previously stored in same bottle with ZUMT 4674 (*Pampus punctatissimus*)]

EAST CHINA SEA

ZUMT 51088 (182.6 mm; East China Sea; Dec. 1959)

Pampus echinogaster (Basilewsky, 1855) コウライマナガツオ

JAPAN

ZUMT 7266 (131.1 mm; Nagasaki Pref.; Dec.; coll. by I. Kaneko)

ZUMT 7912 (273.0 mm; probably collected from Ehime Pref.; coll. by K. Otsuki)

ZUMT 18202 (75.2 mm; Ariake Sea; coll. by personnel of Fukuoka Prefectural Fisheries Experimental Station)

ZUMT 35583 (140.0 mm; Ariake Sea; Oct. 1931; coll. by I. Tomiyama)

ZUMT 44206 (147.5 mm), ZUMT 44207 [148.7 mm; probably obtained at Tokyo Market, Tokyo Met.; previously stored in same bottle with ZUMT 4674 (*Pampus punctatissimus*)]

ZUMT 49842 (224.8 mm; obtained at Fukuoka Fish Market; 28 July 1959)

ZUMT 50741 (61.3 mm), ZUMT 50742 (52.8 mm; Ariake Sea; 19 Apr. 1959; coll. by Y. Tominaga)

ZUMT 50999 (192.2 mm; obtained from fish retailer in Yamashita, Yokohama City, Kanagawa Pref.; 11 May 1960)

CHINA

ZUMT 54483 (147.0 mm), ZUMT 54484 (148.2 mm; East China Sea, east of Nantong, Jiangsu Province (32°35'N, 122°40'E), 23 m depth; 11 Oct. 1984)

EAST CHINA SEA

ZUMT 51472 (87.9 mm), ZUMT 51473 (102.2 mm; East China Sea)

ZUMT 52007 (144.4 mm; East China Sea)

LOCALITY UNKNOWN

ZUMT 63207 (214.5 mm; no data; tagged as "P.-8")

Pampus punctatissimus (Temminck & Schlegel, 1845) マナガツオ

JAPAN

ZUMT 3254 (168.1 mm; obtained at Kumamoto Fish Market, Kumamoto Pref.; 22 Jan. 1912)

ZUMT 4674 (171.0 mm; obtained at Tokyo Market, Tokyo Met.)

ZUMT 11408 (185.3 mm; Shimonoseki City, Yamaguchi Pref.; coll. by T. Kumada)

ZUMT 63240 (28.1 mm; Ariake Sea; 23 July)

EAST CHINA SEA

ZUMT 52008 (224.9 mm; East China Sea)

ZUMT 51089 (194.5 mm; East China Sea; Dec. 1959)

TAIWAN

ZUMT 13702 (152.0 mm; obtained at a fish market in Taipei City; coll. by T. Aoki)

LOCALITY UNKNOWN

ZUMT 54576 (108.0 mm), ZUMT ABE 58-372 (293.7 mm; no data)

ZUMT 63208 (151.4 mm; no data; tagged as “75”)

***Peprilus burti* Fowler, 1944**

ZUMT 63032 (8 specimens, 129.3–137.5 mm; served at a tavern in Hongo, Bunkyo-ku, Tokyo, Japan; Sept. 1969)

Remarks. The species is distributed in the Gulf of Mexico (Hedrich 1967, 2002e; Haedrich and Horn 1972).

Family Ariommatidae オオメメダイ科

***Ariomma brevipanus* (Klunzinger, 1884) ミナミメダイ**

JAPAN

ZUMT 6787 (158.1 mm; obtained at Tokyo Market, Tokyo Met.)

LOCALITY UNKNOWN

ZUMT 40122 (97.3 mm; locality unknown; coll. in 3 Sept. 1922)

ZUMT ABE 59-629 (73.8 mm), ZUMT ABE 60-1341 (182.1 mm; no data)

***Ariomma indica* (Day, 1871) マルイボダイ**

EAST CHINA SEA

ZUMT 51162 (168.7 mm; East China Sea; Jan, 1960)

ZUMT 51441 (119.3 mm; East China Sea; Sept. 1959)

LOCALITY UNKNOWN

ZUMT 52217 (147.6 mm), ZUMT 52218 (158.9 mm; no data)

***Ariomma lurida* Jordan & Snyder, 1904 オオメメダイ**

LOCALITY UNKNOWN

ZUMT ABE 58-114 (184.1 mm; no data)

Family Tetragonuridae ドクウロコイボダイ科
Tetragonurus cuvieri Risso, 1810 ドクウロコイボダイ

JAPAN

ZUMT 39259 (283.3 mm; Hirota Bay, Kesen District, Iwate Pref.; 1938; coll. by R. Chiba)
ZUMT 63434 (345.2 mm; Samani Town, Hokkaido)
ZUMT 63435 (292.5 mm), ZUMT 63436 (330.6 mm), ZUMT 63437 (298.9 mm; Kushiro
City, Hokkaido)

LOCALITY UNKNOWN

ZUMT 63433 (275.5 mm), ZUMT 63821 (260.8 mm; no data)

Tetragonurus pacificus Abe, 1953

PAPUA NEW GUINEA

ZUMT 47823 [holotype of *Tetragonurus pacificus* Abe, 1953; 122.5 mm; east of New Britain,
Papua New Guinea (approx. 6°36'S, 152°29'E; obtained from stomach of *Thunnus*
albacares (Bonnaterre, 1788); 30 Dec. 1952; coll. by *RV Fusa-maru*]

SOUTH PACIFIC

ZUMT 48781 (48.4 mm; approx. 320 km southeast of Banaba, Kiribati; 30 Mar. 1956)

Remarks. Koeda and Teramura (2019) described in detail three examples of the species,
including ZUMT 47823 and 48781.

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References

- Abe, T. 1955. Notes on the adult of *Cubiceps gracilis* from the western Pacific. Journal of the
Oceanographic Society of Japan, 11 (2): 75–80.
Abe, T. 1959. On the presence of at least two species of *Cubiceps* (Nomeidae, Pisces) in the
path of the “Kuro-shiwo”. Record of Oceanographic Works in Japan, Special Number, 3:
225–229.

- Abe, T., Kojima, S. and Kosakai, T. 1963. Description of a new nomeid fish from Japan. *Japanese Journal of Ichthyology*, 11 (1): 31–35.
- Betancur-R., R., Wiley, E. O., Arratia, G., Acero, A., Bailly, N., Miya, M., Lecointre, G. and Ortí, G. 2017. Phylogenetic classification of bony fishes. *BMC Evolutionary Biology*, 17: 162. DOI 10.1186/s12862-017-0958-3
- Cabebe, R. A. and Motomura, H. 2019. Nomeid fishes (Perciformes) from Kagoshima Prefecture, southern Kyushu, Japan. *Nature of Kagoshima*, 46: 117–124.
- Daniel, R. 1973. Siphonophores and their commensals in the Indian Ocean. *Journal of Marine Biological Association of India*, 15 (1): 354–358.
- Haedrich, R. 1967. The stromateoid fishes: systematic and a classification. *Bulletin of the Museum of Comparative Zoology*, 135: 31–139.
- Haedrich, R. L. 2002a. Centrolophidae, medusafishes (ruffs, barrelfish). Pp. 1867–1868. In: Carpenter, K. E. (ed) *FAO species identification guide for fishery purposes and American Society of Ichthyologists and Herpetologists Special Publication no. 5. The living marine resources of the western central Atlantic. Vol. 3. Bony fishes part 2 (Opisthognathidae to Molidae), sea turtles and marine mammals*. FAO, Rome.
- Haedrich, R. L. 2002b. Nomeidae, driftfishes (man-of-war fishes). Pp. 1869–1872. In: Carpenter, K. E. (ed) *FAO species identification guide for fishery purposes and American Society of Ichthyologists and Herpetologists Special Publication no. 5. The living marine resources of the western central Atlantic. Vol. 3. Bony fishes part 2 (Opisthognathidae to Molidae), sea turtles and marine mammals*. FAO, Rome.
- Haedrich, R. L. 2002c. Ariommatidae, ariommas. Pp. 1873–1878. In: Carpenter, K. E. (ed), *FAO species identification guide for fishery purposes and American Society of Ichthyologists and Herpetologists Special Publication no. 5. The living marine resources of the western central Atlantic. Vol. 3. Bony fishes part 2 (Opisthognathidae to Molidae), sea turtles and marine mammals*. FAO, Rome.
- Haedrich, R. L. 2002d. Tetragonuridae, squaretails. P. 1878. In: Carpenter, K. E. (ed), *FAO species identification guide for fishery purposes and American Society of Ichthyologists and Herpetologists Special Publication no. 5. The living marine resources of the western central Atlantic. Vol. 3. Bony fishes part 2 (Opisthognathidae to Molidae), sea turtles and marine mammals*. FAO, Rome.
- Haedrich, R. L. 2002e. Stromateidae, butterfishes (harvestfishes). Pp. 1879–1884. In: Carpenter, K. E. (ed), *FAO species identification guide for fishery purposes and American Society of Ichthyologists and Herpetologists Special Publication no. 5. The living marine resources of the western central Atlantic. Vol. 3. Bony fishes part 2 (Opisthognathidae to Molidae), sea turtles and marine mammals*. FAO, Rome.
- Haedich, R. L. and Horn, M. H. 1972. A key to the stromateoid fishes. *Woods Hole Oceanographic Institution Technical Report*, 1972 (3): 1–46.
- Harrington, R. C., Friedman, M., Miya, M., Near, T. J. and Campbell, M. A. 2021. Phylogenomic resolution of the monotypic and enigmatic Amarsipus, the Bagless Glassfish (Teleostei, Amarsipidae). *Zoologica Scripta*, 50 (4): 411–422.
- Hata, H. 2020. *Hyperoglyphe japonica* (Döderlein, 1884). P. 448. In: Koeda, K., Hata, H., Yamada, M. and Motomura, H. (eds.) *Fishes from markets in Osumi Peninsula, Kagoshima, Japan. The Kagoshima University Museum, Kagoshima. (In Japanese)*

- Hata, H. 2022. Stromateidae. P. 191. In: Iwatsubo, K., Itou, M., Yamada, M. and Motomura, H. (eds), Field guide to fishes of the East China Sea and Yatsushiro Sea side of Satsuma Peninsula in Kagoshima, southern Kyushu, Japan. Kagoshima Museum of Aquatic Biodiversity, Kagoshima and the Kagoshima University Museum, Kagoshima. (In Japanese)
- Hata, H., Itou, M. and Motomura, H. 2016. *Ariomma brevimanum* (Perciformes: Ariommatidae) from Kagoshima Prefecture, southern Japan. Nanki Seibutu, 58 (1): 44–47. (In Japanese)
- Hata, H. and Motomura, H. 2018. Records of *Ariomma brevimanum* (Perciformes: Ariommatidae) from Kashiwa-jima island and Muroto, Kochi Prefecture, Japan. Bulletin of the Shikoku Institute of Natural History, 11: 10–15. (In Japanese)
- Jenkins, R. L. 1983. Observations on the commensal relationship of *Nomeus gronovii* with *Physalia physalis*. Copeia, 1983 (1): 250–252.
- Kagoshima City Aquarium Foundation. 2008. Fishes collected with set net confirmed by Kagoshima city aquarium in Kagoshima. Kagoshima City Aquarium Foundation, Kagoshima, 224 pp. (In Japanese)
- Kagoshima City Aquarium Foundation. 2018. Fishes collected with set nets in Kagoshima and confirmed by Kagoshima City Aquarium. Second edition. Kagoshima City Aquarium Foundation, Kagoshima, 335 pp. (In Japanese)
- Kato, K. 1933. Is *Nomeus* a harmless inquilinus of *Physalia*? Proceedings of the Imperial Academy, 9 (9): 537–538.
- Koeda, K. 2019. Centrolophidae. Pp. 1183–1184. In: Koeda, K. and Ho, H.-C. (eds), Fishes of southern Taiwan. National Museum of Marine Biology & Aquarium, Pingtung, Taiwan.
- Koeda, K., Hata, H., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. History of the fish collection of the Department of Zoology, The University Museum, The University of Tokyo. The University Museum, The University of Tokyo Material Reports, 129: 1–24. (In Japanese)
- Koeda, K. and A. Teramura. 2019. Redescription of *Tetragonurus pacificus* (Teleostei: Stromateoidei: Tetragonuridae), based on specimens collected from Taiwan and Tarawa Atoll. Zootaxa, 4702 (2): 26–31.
- Last, P. R. 2001a. Amarsipidae, amarsipas. Pp. 3765–3766. In: Carpenter, K. E. and Niem, V. H. (eds), FAO species identification guide for fishery purposes. The living marine resources of the western central Pacific. Vol. 6. Bony fishes part 4 (Labridae to Latimeriidae), estuarine crocodiles, sea turtles, sea snakes and marine mammals. FAO, Rome.
- Last, P. R. 2001b. Centrolophidae, medusafishes (ruffs, barrelfishes). Pp. 3767–3770. In: Carpenter, K. E. and Niem, V. H. (eds), FAO species identification guide for fishery purposes. The living marine resources of the western central Pacific. Vol. 6. Bony fishes part 4 (Labridae to Latimeriidae), estuarine crocodiles, sea turtles, sea snakes and marine mammals. FAO, Rome.
- Last, P. R. 2001c. Nomeidae, driftfishes (cigarfishes). Pp. 3771–3779. In: Carpenter, K. E. and Niem, V. H. (eds), FAO species identification guide for fishery purposes. The living marine resources of the western central Pacific. Vol. 6. Bony fishes part 4 (Labridae to Latimeriidae), estuarine crocodiles, sea turtles, sea snakes and marine mammals. FAO, Rome.

- Last, P. R. 2001d. Ariommatidae, ariommas. Pp. 3780–3783. In: Carpenter, K. E. and Niem, V. H. (eds), FAO species identification guide for fishery purposes. The living marine resources of the western central Pacific. Vol. 6. Bony fishes part 4 (Labridae to Latimeriidae), estuarine crocodiles, sea turtles, sea snakes and marine mammals. FAO, Rome.
- Last, P. R. 2001e. Tetragonuridae, squaretailes. Pp. 3784–3785. In: Carpenter, K. E. and Niem, V. H. (eds), FAO species identification guide for fishery purposes. The living marine resources of the western central Pacific. Vol. 6. Bony fishes part 4 (Labridae to Latimeriidae), estuarine crocodiles, sea turtles, sea snakes and marine mammals. FAO, Rome.
- Last, P. R. 2001f. Stromateidae, butterfishes (silver pomfrets). Pp. 3786–3791. In: Carpenter, K. E. and Niem, V. H. (eds), FAO species identification guide for fishery purposes. The living marine resources of the western central Pacific. Vol. 6. Bony fishes part 4 (Labridae to Latimeriidae), estuarine crocodiles, sea turtles, sea snakes and marine mammals. FAO, Rome.
- Lee, W. J., Ryu, J.-H., Yoon, M., An H. S., Woo, J., Tashiro, F. and Kim, J.-K. 2016. New Korean record of the Banded Driftfish, *Psenes arafurensis* (Pisces: Nomeidae). Fisheries and Aquatic Sciences, 19: 6. DOI 10.1186/s41240-016-0006-z
- Matsunuma, M. and Okamoto, M. 2015. Second Japanese record of *Amarsipus carlsbergi* (Amarsipidae) from the East China Sea. Bulletin of the Biogeographical Society of Japan, 70: 215–219. (In Japanese)
- Miya, M., Friedman, M., Satoh, T. P., Takeshima, H., Sado, T., Iwasaki, W., Yamanoue, Y., Nakatani, M., Mabuchi, K., Inoue, J. G., Poulsen, J. Y., Fukunaga, T., Sato, Y. and Nishida, M. 2013. Evolutionary origin of the Scombridae (tunas and mackerels): members of Paleogene adaptive radiation with 14 other pelagic fish families. PLoS ONE 8 (9): e73535.
- Nakabo, T. and Doiuchi, R. 2013a. Centrolophidae, butterfishes or medusafishes. Pp. 1078, 2039. In: Nakabo, T. (ed) Fishes of Japan with pictorial keys to the species third edition. Tokai University Press, Hadano. (In Japanese)
- Nakabo, T. and Doiuchi, R. 2013b. Stromateidae, butterfishes. Pp. 1079–1080, 2039–2041. In: Nakabo, T. (ed) Fishes of Japan with pictorial keys to the species third edition. Tokai University Press, Hadano. (In Japanese)
- Nakabo, T. and Doiuchi, R. 2013c. Nomeidae, driftfishes. Pp. 1081–1083, 2041–2042. In: Nakabo, T. (ed) Fishes of Japan with pictorial keys to the species third edition. Tokai University Press, Hadano. (In Japanese)
- Nakabo, T. and Doiuchi, R. 2013d. Ariommatidae, eyebrowfishes. Pp. 1084, 2042. In: Nakabo, T. (ed) Fishes of Japan with pictorial keys to the species third edition. Tokai University Press, Hadano. (In Japanese)
- Nakabo, T. and Doiuchi, R. 2013e. Tetragonuridae, square tails. Pp. 1085, 2042–2043. In: Nakabo, T. (ed) Fishes of Japan with pictorial keys to the species third edition. Tokai University Press, Hadano. (In Japanese)
- Okamoto, M., Hoshino, K. and Jintoku, T. 2011. First record of *Amarsipus carlsbergi* (Perciformes: Stromateoidei: Amarsipidae) from Japan and a northernmost range extension. Biogeography, 13: 25–29.

- Okamura, O. 1997. Nomeidae. Pp. 662–663. In: Okamura, O. and Amaoka, K. (eds) Sea fishes of Japan. Yama-kei Publishers, Tokyo. (In Japanese)
- Sakai, K. 2010. Invasion of Nomura's Jellyfish (*Nemopilema nomurai*) and rare fishes. News Letter of Noto Marine Center, 33: 7. (In Japanese)
- Suda, Y., Tachikawa, H. and Baba, O. 1986. Adult form of the stromateoid fish, *Nomeus gronovii*, from the north Pacific. Japanese Journal of Ichthyology, 33 (3): 319–322.
- Tsuji, T., Sakai, K., Kimoto, A. and Okuno, J. 2010. New record of fishes captured around Noto Peninsula. Bulletin of Ishikawa Prefecture Fisheries Research Center, 5: 35–39. (In Japanese)
- Wada, H. 2019. Nomeidae. Pp. 1185–1189. In: Koeda, K. and Ho, H.-C. (eds), Fishes of southern Taiwan. National Museum of Marine Biology & Aquarium, Pingtung, Taiwan.
- Yamada, U. 1986a. *Psenopsis anomala*. Pp. 272–273. In: Okamura, O. (ed) Fishes of the East China Sea and the Yellow Sea. Seikai Regional Fisheries Research Laboratory, Nagasaki. (In Japanese)
- Yamada, U. 1986b. *Hyperoglyphe japonica*. P. 274. In: Okamura, O. (ed) Fishes of the East China Sea and the Yellow Sea. Seikai Regional Fisheries Research Laboratory, Nagasaki. (In Japanese)
- Yamada, U. 1986c. *Pampus argenteus*. Pp. 280–281. In: Okamura, O. (ed) Fishes of the East China Sea and the Yellow Sea. Seikai Regional Fisheries Research Laboratory, Nagasaki. (In Japanese)
- Yoshino, Y. 2008. Marine fishes of Japan. Yama-kei Publishing, Tokyo. 543 pp. (In Japanese)

Specimens of the families Emmelichthyidae and Lobotidae (Actinopterygii: Teleostei) deposited in the Department of Zoology, The University Museum, The University of Tokyo

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Abstract

A list of specimens of the families Emmelichthyidae and Lobotidae deposited in the Department of Zoology, The University Museum, The University of Tokyo is provided. Forty-six specimens of three emmelichthyid species, including three paratypes of *Emmelichthys struhsakeri* Heemstra & Randall, 1977, and eight specimens of a single lobotid species, *Lobotes surinamensis* (Bloch, 1790), were confirmed. However, no specimens were found of the genus *Datonioides*, which is sometimes included together with *Lobotes* within the family Lobotidae.

Introduction

The rovers, included within the family Emmelichthyidae, comprise three genera and about 18 species (Heemstra and Randall 1977; Kotlyar 1982; Parin 1991; Randall and Rivaton 1992; Miyahara and Okamura 1998; Fricke et al. 2014), most of which are often found near the sea bottom in 100 to 400 m depth (Heemstra and Randall 1977; Carpenter 2001a; Hatooka and Hagiwara 2013). Some emmelichthyid species, such as *Erythrocles schlegelii* (Richardson, 1846), are abundantly landed in tropical areas and are important as food fishes (Koeda 2018a, 2019a, 2020a; Shimose 2021). As indicated by Heemstra and Randall (1977), the phylogenetic position of the family is still uncertain, Betuncur-R et al. (2017) regarding it as “Order-level incertae sedis”.

The family Lobotidae (tripletails) is monotypic, including only the genus *Lobotes* Cuvier, 1829 (Kottelat 2013; Betuncur-R et al. 2017), and is characterized by a compressed body, mouth roof without teeth, and soft portions of the dorsal and anal fins rounded and extending beyond the caudal-fin base. Tripletail species are distributed circumglobally, attaining 1 m in total length, and are highly evaluated as food and sport fishes (Heemstra 1995; Carpenter 2001b, 2002, 2016; Koeda 2018b, 2019b, 2020b). Juveniles, which mimic leaves, are often associated with floating objects (Breder Jr. 1949; Sasaki 1997; Kato 2014).

The phylogenetic position of the genus *Lobotes* is somewhat fluid, due to frequent inclusion in a single family with *Datnioides* Bleeker, 1853 (e.g., Rainboth 1996; Carpenter 2001b; Nagao Natural Environment Foundation 2021), the species of which (so-called tigerperches or tigerfishes) inhabit freshwater/brackish regions in South and Southeast Asia (Roberts and Kottelat 1994; Pisces Publishers 2004). Species of *Lobotes* can be distinguished from *Datnioides* by their plain dark colored body (vs. distinct dark bars on the body in *Datnioides*) and the second anal-fin spine not enlarged (vs. enlarged, distinctly longer than third anal-fin spine) (Carpenter 2001b; Nagao Natural Environment Foundation 2021). Recently, Betuncur-R et al. (2017) included the genus in the monotypic family Datnioididae, which together with Lobotidae and Hapalogenyidae comprised the Lobotiformes. Subsequently, Gill and Leis (2019) included Datnioididae and Hapalogenyidae within Lobotidae, which they assigned to Acanthuriformes, together with numerous families, such as Acanthuridae, Chaetodontidae, Antigonidae, and Leiognathidae. The species-level taxonomy of *Lobotes* is also confused, the genus being generally thought to comprise two species, *Lobotes pacifica* Gilbert, 1898 (endemic to the eastern Pacific) and *Lobotes surinamensis* (Bloch, 1790) (a cosmopolitan species, except in the eastern Pacific) (Kottelat 2013). However, differences between the two species remain unclear, and the possibility of cryptic species has been suggested (Mundy 2005; Kharin et al. 2009; Kottelat 2013). Since they constitute an important source for future taxonomic studies, a list of specimens of Emmelichthyidae and Lobotidae deposited in the Department of Zoology, The University Museum, The University of Tokyo is provided.

Materials and Methods

Specimens of Emmelichthyidae and Lobotidae in the Department of Zoology, The University Museum, The University of Tokyo (abbreviated as ZUMT) were identified during the present study, following Heemstra and Randall (1977), Carpenter (2001a), and Hatooka and Hagiwara (2013), and Carpenter (2001b) and Hatooka (2013), respectively. Parentheses following registration numbers include specimen numbers (if plural specimens were included in the lot), standard length, collection locality, collection date, and collector, plus type status (if applicable). Collection data of specimens are omitted if the same as that for the previous specimen. The collection year and collector for some specimens were estimated following Koeda et al. (2022).

The ZUMT specimens listed herein were primarily stored in Room 406 (specimen storage room), with additional specimens in Room 407 (including types and S. Tanaka specimens), in the museum building. Most were stored in shelved containers, although some larger specimens were stored in a glass tank (labelled “Emmelichthyidae”) in the same room, with the glass lid sealed with a silicon adhesive (as of Apr. 2022). Although some of the ZUMT specimens, collected by Dr. Tokiharu Abe had not been registered into the ZUMT collection, with the collection data of most missing, they are listed herein together with their ZUMT ABE number (number with underbar written on the specimen label), in the hope that Dr Abe’s catalog books with collection data will be rediscovered in the future. Additionally, specimens with catalogue numbers ZUMT ABE 2700 to 6000 were collected from Palau by Dr. Abe between 1936 and 1937 (Koeda et al. 2022).

Results

Examples of three emmelichthyid species, comprising 46 specimens, and eight specimens of *Lobotes surinamensis* were confirmed in the ZUMT collection. The existence of three paratypes of *Emmelichthys struhsakeri* in the collection was also confirmed. However, no ZUMT specimens or ZUMT ledger registrations of examples of the genus *Datnioides* were found. A list of ZUMT specimens of the family Hapalogenyidae was published by Hata et al. (2022).

Species accounts

Family Emmelichthyidae ハチビキ科

Emmelichthys karnellai Heemstra & Randall, 1977 トゲナシチビキ

JAPAN

ZUMT 19377 (185.9 mm; Hachijo-jima Island, Izu Islands, Japan; coll. by Y. Oshizu)

Remarks: This species has been recorded previously in Japanese waters, only from Ryukyu Archipelago and “Omurodashi Bank” (submarine volcano located ca. 20 km southeast of Izu-oshima Island, Izu Islands) (Heemstra and Randall 1977; Yoshino and Kon 2000; Hatooka and Hagiwara 2013; Akaike et al. 2021). The present ZUMT specimen, collected from Hachijo-jima Island (ca. 170 km south of Izu-oshima Island), represents the first record of the species from that locality.

Emmelichthys struhsakeri Heemstra & Randall, 1977 ロウソクチビキ

JAPAN

ZUMT 19375 (170.6 mm), ZUMT 19376 (176.5 mm), ZUMT 19458 (219.7 mm), ZUMT 19459 (216.9 mm), ZUMT 19460 (201.4 mm), ZUMT 40190 (186.3 mm), ZUMT 40191 (160.4 mm), ZUMT 40192 (171.0 mm), ZUMT 40193 (154.8 mm), ZUMT 40194 (178.3 mm), ZUMT 40195 (162.6 mm), ZUMT 40196 (188.5 mm), ZUMT 40197 (172.5 mm), ZUMT 40198 (168.9 mm), ZUMT 40199 (165.8 mm), ZUMT 40200 (166.0 mm), ZUMT 40201 (179.3 mm), ZUMT 40202 (169.9 mm), ZUMT 40203 (164.6 mm), ZUMT 40204 (184.9 mm), ZUMT 40205 (170.6 mm), ZUMT 40206 (164.5 mm), ZUMT 40207 (175.7 mm; Hachijo-jima Island, Izu Islands, Japan; coll. by Y. Oshizu)

ZUMT 44121 (161.6 mm; Hachijo-jima Island, Izu Islands, Sept. 1922; coll. by M. Uchiyama)

ZUMT 54056 (paratype of *E. struhsakeri*; formerly registered as ZUMT ABE 16710, 122.5 mm), ZUMT 54057 (paratype of *E. struhsakeri*; formerly registered as ZUMT ABE 16712, 132.4 mm; off Manazuru Town, Kanagawa Pref.)

HAWAIIAN ISLANDS

ZUMT 53889 [paratype of *E. struhsakeri*; 122.5 mm; Penguin Bank, approx. 15 km east of Moloka'i, Hawaiian Islands (21°09'08"N, 157°27'05"W); 183 m depth; 6 Nov. 1968; trawl; coll. by RV *Townsend Cromwell*]

Erythrocles schlegelii (Richardson, 1846) ハチビキ

JAPAN

- ZUMT 2929 (395.1 mm; Nagasaki Prefecture; Jan. 1911)
ZUMT 13519 (191.2 mm), ZUMT 13520 (176.4 mm; obtained at Tokyo Market, Tokyo Met.),
ZUMT 15098 [329.0 mm; probably Okinawa-jima Island, Ryukyu Archipelago; coll. by
S. Sakaguchi (Okinawa Prefectural Daiichi Junior High School)]
ZUMT 21733 (258.4 mm; Wakayama Pref.; 22 Jan. 1906)
ZUMT 49900 (219.1 mm; Fukue, Goto City (Fukue-jima Island, Goto Islands); 10 June 1953;
coll. by I. Tomiyama)
ZUMT ABE 16573 (80.8 mm), ZUMT ABE 16711 (121.1 mm; off Manazuru Town,
Kanagawa Pref.)

LOCALITY UNKNOWN

- ZUMT 40185 (149.5 mm), ZUMT 40186 (194.8 mm), ZUMT 40188 (191.2 mm), ZUMT
40189 (190.3 mm), ZUMT 40208 (190.8 mm), ZUMT 40209 (187.4 mm), ZUMT 63839
(198.2 mm), ZUMT ABE 60-204 (121.3 mm), ZUMT ABE 60-737 (128.0 mm), ZUMT
ABE 83-250 (144.7 mm; no data)

Family Lobotidae マツダイ科

Lobotes surinamensis (Bloch, 1790) マツダイ

JAPAN

- ZUMT 4357 (228.0 mm; off Hamada City, Shimane Pref.; 5 Oct. 1914; coll. by personnel of
Shimane Prefectural Fisheries Experimental Station)
ZUMT 12337 (121.0 mm; probably collected from Amami-oshima Island, Amami Islands,
Kagoshima Pref.)
ZUMT 21312 (22.8 mm; Kanagawa Pref.; 20 Sept. 1925)
ZUMT 42406 (39.7 mm), ZUMT 42407 (25.8 mm; Shimoda City, Shizuoka Pref.; coll. by
M. Kato)
ZUMT ABE 10114 (83.6 mm; Manazuru Town, Kanagawa Pref.; 19 Sept. 1954)

LOCALITY UNKNOWN

- ZUMT 64095 (165.5 mm), ZUMT ABE 13239 (542.0 mm; no data)

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References

- Akaike, T., Maekawa, T. and Motomura, H. 2021. Reliable records of *Emmelichthys karnellai* Heemstra and Randall, 1977 from Amami-oshima and Okinawa-jima islands, Ryukyu Islands, Japan. *Ichthy, Natural History of Fishes of Japan*, 13: 36–39. (In Japanese)
- Betancur-R., R., Wiley, E. O., Arratia, G., Acero, A., Bailly, N., Miya, M., Lecointre, G. and Ortí, G. 2017. Phylogenetic classification of bony fishes. *BMC Evolutionary Biology*, 17: 162. DOI 10.1186/s12862-017-0958-3
- Breder Jr., C. M. 1949. On the behavior of young *Lobotes surinamensis*. *Copeia*, 1949 (4): 237–242.
- Carpenter, K. E. 2001a. Emmelichthyidae, rovers (rubyfishes). Pp. 2838–2839. In: Carpenter, K. E. and Niem, V. H. (eds) *FAO species identification guide for fishery purposes. The living marine resources of the western central Pacific, vol. 5, body fishes part 3 (Menidae to Pomacentridae)*. FAO, Rome.
- Carpenter, K. E. 2001b. Lobotidae, tripletales. Pp. 2942–2945. In: Carpenter, K. E. and Niem, V. H. (eds) *FAO species identification guide for fishery purposes. The living marine resources of the western central Pacific, vol. 5, body fishes part 3 (Menidae to Pomacentridae)*. FAO, Rome.
- Carpenter, K. E. 2002. Lobotidae, tripletails. P. 1505. In: Carpenter, K. E. (ed), *FAO species identification guide for fishery purposes and American Society of Ichthyologists and Herpetologists Special Publication no. 5. The living marine resources of the western central Atlantic. Vol. 3. Bony fishes part 2 (Opisthognathidae to Molidae), sea turtles and marine mammals*. FAO, Rome.
- Carpenter, K. E. 2016. Lobotidae, tripletales. Pp. 2544–2545. In: Carpenter, K. E. and De Angelis, N. (eds) *FAO species identification guide for fishery purposes. The living marine resources of the eastern central Atlantic. Volume 4. Bony fishes part 2 (Perciformes to Tetraodontiformes), sea turtles and marine mammals*. FAO, Rome.
- Fricke, R., Golani, D. and Appelbaum-Golani, B. 2014. *Emmelichthys marisrubri*, a new rover from the southern Red Sea (Teleostei: Emmelichthyidae). *Cybium*, 38 (2): 83–87.
- Gill, A. C. and Leis, J. M. 2019. Phylogenetic position of the fish genera *Lobotes*, *Datnioides* and *Hapalogenys*, with a reappraisal of acanthuriform composition and relationships based on adult and larval morphology. *Zootaxa*, 4680 (1): 1–81.
- Hagiwara, K. and Okabe, K. 2012. *Emmelichthys karnellai* (Perciformes: Emmelichthyidae) collected from the near water of the Izu Islands, Japan. *Science Report of Yokosuka City Museum*, 59: 29–30. (In Japanese)
- Hata, H., Koeda, K. Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. List of the specimens of families Haemulidae and Hapalogenyidae (Actinopterygii: Teleostei) deposited in the Department of Zoology, The University Museum, The University of Tokyo. *The University Museum The University of Tokyo Bulletin*, 128: 103–120.

- Hatooka, K. 2013. Lobotidae, tripletails. Pp. 934, 2005. In: Nakabo, T. (ed) Fishes of Japan with pictorial keys to the species, third edition. Tokai University, Press, Hadano. (In Japanese)
- Hatooka, K. and Hagiwara, K. 2013. Emmelichthyidae, rovers. Pp. 911–912, 2000–2001. In: Nakabo, T. (ed) Fishes of Japan with pictorial keys to the species, third edition. Tokai University, Press, Hadano. (In Japanese)
- Heemstra, P. C. 1995. Lobotidae, dormilonas. P. 1226. In: Fischer, W., Krupp, F., Schneider, W., Sommer, C., Carpenter, K. and Niem, V. H. (eds), Guía FAO para la identificación para los fines de la pesca. Pacífico centro-oriental. Volumen III. Vertebrados Parte 2. FAO, Rome. (In Spanish)
- Heemstra, P. C. and Randall, J. E. 1977. A revision of the Emmelichthyidae (Pisces: Perciformes). Australian Journal of Marine and Freshwater Research, 28 (3): 361–396.
- Kato, S. 2014. Marine fishes illustrated, 1000+. Seibundo-shinkosha, Tokyo. 383 pp. (In Japanese)
- Kharin, V. E. 2009. About the taxonomic status of rare fish species Surinam tripletail *Lobotes surinamensis* (Lobotidae) and new discovery of this species in Russian waters. Journal of Ichthyology, 49 (1): 32–38.
- Koeda, K. 2018a. *Erythrocles schlegelii* (Richardson, 1846). P. 270. In: Koeda, K., Hata, H., Yamada, M. and Motomura, H. (eds) Field guide to fishes landed at Uchinoura Fishing Port, Kagoshima, Japan. The Kagoshima University Museum, Kagoshima. (In Japanese)
- Koeda, K. 2018b. *Lobotes surinamensis* (Bloch, 1790). P. 289. In: Koeda, K., Hata, H., Yamada, M. and Motomura, H. (eds) Field guide to fishes landed at Uchinoura Fishing Port, Kagoshima, Japan. The Kagoshima University Museum, Kagoshima. (In Japanese)
- Koeda, K. 2019a. Emmelichthyidae. P. 775. In: Koeda, K. and Ho, H.-C. (eds) Fishes of southern Taiwan. National Museum of Marine Biology & Aquarium, Pingtung, Taiwan.
- Koeda, K. 2019b. Lobotidae. P. 816. In: Koeda, K. and Ho, H.-C. (eds) Fishes of southern Taiwan. National Museum of Marine Biology & Aquarium, Pingtung, Taiwan.
- Koeda, K. 2020a. *Erythrocles schlegelii* (Richardson, 1846). P. 328. In: Koeda, K., Hata, H., Yamada, M. and Motomura, H. (eds) Fishes from markets in Osumi Peninsula, Kagoshima, Japan. The Kagoshima University Museum, Kagoshima. (In Japanese)
- Koeda, K. 2020b. *Lobotes surinamensis* (Bloch, 1790). P. 349. In: Koeda, K., Hata, H., Yamada, M. and Motomura, H. (eds) Fishes from markets in Osumi Peninsula, Kagoshima, Japan. The Kagoshima University Museum, Kagoshima. (In Japanese)
- Koeda, K., Hata, H., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. History of the fish collection of the Department of Zoology, The University Museum, The University of Tokyo. The University Museum, The University of Tokyo Material Reports, 129: 1–24.
- Kotlyar, A. N. 1982. A new species of the genus *Emmelichthys* (Emmelichthyidae, Osteichthyes) from the south-western [sic, south-eastern] part of the Pacific Ocean. Bulletin of the Moscow Society of Naturalists Biological Series, 87 (1): 48–52. (In Russian)
- Kottelat, M. 2013. The fish of the inland waters of South-east Asia: a catalogue and core bibliography of the fishes known to occur in freshwaters, mangroves and estuaries. The Raffles Bulletin of Zoology Supplement, 27: 1–663.

- Miyahara, H. and Okamura, O. 1998. *Erythrocles microceps*, a new emmelichthyid fish from Kochi, Japan. *Ichthyological Research*, 45 (1): 85–88.
- Mundy, B. C. 2005. Checklist of the fishes of the Hawaiian Archipelago. Bishop Museum Bulletin in Zoology, 6: 1–704.
- Nagao Natural Environment Foundation. 2021. Fishes of the Indochinese Mekong. Nagao Natural Environment Foundation, Tokyo. xii+546 pp.
- Parin, N. V. 1991. Three new species of the benthopelagic fish genus *Plagiogeneion* from the southern Pacific and Indian oceans (Teleostei: Emmelichthyidae). *Proceedings of the Biological Society of Washington*, 104 (3): 459–467.
- Pisces Publishers. 2004. Picture book of aquarium fish & water-plants. Pisces Publishers, Tokyo. 510. (In Japanese)
- Rainboth, W. J. 1996. FAO species identification field guide for fishery purposes. Fishes of the Cambodian Mekong. FAO, Rome. 265 pp., 27 pls.
- Randall, J. E. and Rivaton, J. 1992. *Erythrocles taeniatus*, a new emmelichthyid fish from New Caledonia. *Copeia*, 1992 (4): 1028–1032, pl. 1.
- Roberts, T. R. and Kottelat, M. 1994. The Indo-Pacific tigerperches, with a new species from the Mekong basin (Pisces: Coiidae). *Ichthyological Exploration of Freshwaters*, 5 (3): 257–266.
- Sasaki, K. 1997. *Lobotes surinamensis*. P. 344. In: Okamura, O. and Amaoka, K. (eds) Sea fishes of Japan. Yama-kei Publishers, Tokyo. (In Japanese)
- Shimose, T. 2021. Commercial fishes and shellfishes of Okinawa. Okinawa Times, Naha. 206 pp. (In Japanese)
- Yoshino, T. and Kon, T. 2000. First record of an emmelichthyid fish, *Emmelichthys karnellai*, from the western north Pacific (Pisces: Perciformes: Emmelichthyidae). *Biogeography*, 2: 63–65.

Fish types deposited in the Department of Zoology, The University Museum, The University of Tokyo - Part 2: Myxiniiformes, Lamniformes, Carcharhiniiformes, Squaliformes, Torpediniiformes, Rajiiformes, Chimaeriformes, and Acipenseriformes
東京大学総合研究博物館動物部門収蔵の魚類タイプ標本—第 2 部：ヌタウナギ目、ネズミザメ目、メジロザメ目、ツノザメ目、シビレエイ目、ガンギエイ目、ギンザメ目、チョウザメ目

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Abstract

The current status of type specimens of Myxiniiformes, Lamniformes, Carcharhiniiformes, Squaliformes, Torpediniiformes, Rajiiformes, Chimaeriformes, and Acipenseriformes in the ZUMT collection were investigated with recourse to original descriptions, information tags on specimens, and/or the ZUMT specimen ledger.

Introduction

The current designation and status of type specimens in the fish collection, preserved in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT) collection is now under review. The present list is a summary of type specimens of Myxiniiformes, Lamniformes, Carcharhiniiformes, Squaliformes, Torpediniiformes, Rajiiformes, Chimaeriformes, and Acipenseriformes currently held.

本研究では、ZUMT コレクションに収蔵されるタイプ標本の現状について整理するとともに、タイプ指定に関する議論もおこなった。本リストは、ZUMT に含まれるタイプ標本のうちヌタウナギ目、ネズミザメ目、メジロザメ目、ツノザメ目、シビレエイ目、ガンギエイ目、ギンザメ目、チョウザメ目までの魚類についてまとめたものである。

Materials and Methods

The “available” type specimens of Myxiniiformes, Lamniformes, Carcharhiniiformes, Squaliformes, Torpediniiformes, Rajiiformes, Chimaeriformes, and Acipenseriformes in the ZUMT collection were confirmed by the first author. They are currently stored in room 407 in the museum building. The ZUMT collection also includes a variety of personal specimens

acquired by the late Tokiharu Abe, such being identifiable in the first instance by an underlined number on the specimen tag. Although those specimens were at no time registered into the ZUMT collection, they are treated here as ZUMT ABE XXXX.

The systematic arrangement of families generally follows Nelson (2006), with species arranged in alphabetical order by species name. The present list includes all the available information pertinent to the ZUMT specimens, including that taken from the ZUMT specimen ledger and/or tags on the specimens.

Information from original description: scientific name, publication, Japanese name in the original description.

Current status on types: available or lost.

Information on type specimens: ZUMT catalog number (number of specimens when more than two), field number or previous catalog number if available, sex, preservation status (stuffed or skin only indicated), collection locality, collection date, collector or donator, collection method, typographical error.

Remarks: Authority for determining type status, correction of previously published erroneous information, and newly determined information from specimen registers and tags.

Current status of species: synonyms, current scientific name and standard Japanese name.

Reference: publications cited in remarks or basis for current status. Listed for each species.

第一著者により、ZUMT に所在するヌタウンギ目、ネズミザメ目、メジロザメ目、ツノザメ目、シビレエイ目、ガンギエイ目、ギンザメ目、チョウザメ目魚類のタイプ標本が確認された。本タイプリストにおいて確認と示した標本は博物館の 407 号室に保管されている。ZUMT コレクションには、故阿部宗明の個人標本が混在しており、これらは基本的に標本タグに書かれた番号に下線が付されていることで識別可能である。これら阿部氏の標本は、ZUMT コレクションに登録されていないものの、本リストにおいては ZUMT ABE ○○○○として扱った。

科の体系的な順番は、主に Nelson (2006) に従い、種については学名のアルファベット順に示した。本リストでは、ZUMT 標本に基づき（あるいは基づいたと想定される）記載されたヌタウンギ目、ネズミザメ目、メジロザメ目、ツノザメ目、シビレエイ目、ガンギエイ目、ギンザメ目、チョウザメ目魚類に関する以下の情報を可能な限り示した。また ZUMT 標本台帳や標本のタグから読み取れる情報についても含めた。

原記載の情報：学名、記載された出版物、記載時に与えられた和名。

タイプ標本の確認状況：確認または未確認。

タイプ標本の情報：ZUMT 番号（複数の場合は標本数）、フィールド番号または寄贈前の他機関登録番号、性別、保存の状態（剥製または皮膚のみの場合に記載）、採集場所、採集年月日、採集者または寄贈者、採集方法など。標本台帳から読み取れる新たな情報についても可能な限り記した。

備考：該当標本をタイプと判断した根拠、ZUMT のタイプ標本が誤って引用された情報、本研究で新たに確認された標本台帳やタグに関する情報、入力ミスなどについて必要に応じて記した。

種の現状：シノニム関係および適用されている学名と標準和名。

引用文献：備考で引用した印刷物や種の現状に関する根拠。種ごとに示した。

Type specimens of Myxiniformes, Lamniformes, Carcharhiniformes, Squaliformes, Torpediniformes, Rajiformes, Chimaeriformes, and Acipenseriformes in ZUMT

Based on the original descriptions, tags on the specimens, and the ZUMT specimen ledger, type specimens of 28 species of Myxiniformes, Lamniformes, Carcharhiniformes, Squaliformes, Torpediniformes, Rajiformes, Chimaeriformes, and Acipenseriformes in 15 families, including 22 holotypes, 9 syntypes, 2 lectotypes, 15 paratypes and 2 paralectotypes, were purported to be in the ZUMT collection. 7 holotypes, 2 syntypes and 4 paratypes have been confirmed as “available” to date.

原記載、標本のタグおよび ZUMT 台帳の情報などから ZUMT コレクションに所蔵されるヌタウナギ目、ネズミザメ目、メジロザメ目、ツノザメ目、シビレエイ目、ガンギエイ目、ギンザメ目、チョウザメ目魚類標本には 15 科 28 種のタイプ標本が登録（あるいは未登録）されていることが明らかになった。その内訳はホロタイプ 22 標本、シンタイプ 9 標本、レクトタイプ 2 標本、パラタイプ 15 標本、パラレクトタイプ 2 標本である。本研究において、これらのうち現在 ZUMT に所在することが確認できたものはホロタイプ 7 標本、シンタイプ 2 標本、パラタイプ 4 標本である。

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ZUMT コレクションに多大な貢献をされた故富永義明氏に深く感謝する。また、東京海洋大学の阿部意央太氏、藤原咲紀氏、飯沼 藍氏、齋藤 舞氏、高橋あゆみ氏、東京大学の深谷真央氏、伊藤想也氏およびボランティアの尾形比呂哉氏には標本の管理にご助力いただいた。G. S. Hardy 氏 (Ngunguru, New Zealand) には原稿の英文を校閲いただいた。本研究の一部は、第 2 著者への日本学術振興会科研費 21K06313 JP、日本学術振興会笹川科学研究助成金 (2021-4064) の助成を受けた。

Myxiniformes ヌタウナギ目
Myxinidae ヌタウナギ科
Homea okinoseana Dean, 1904

Original description: Dean (1904): 8, 20, fig. 2B, pl. 1 (fig. 1).

Dean, B. 1904. Notes on Japanese myxinoids. A new genus *Paramyxine* and a new species *Homea okinoseana*. Reference also to their eggs. Journal of the College of Science. Imperial University, Tokyo, 19 (2): 1–25, pl. 1.

Syntypes (lost): ZUMT 1449 (1, female), ZUMT 1450 (1, male), off Misaki, Sagami Sea, Japan, depth 400 fathoms; May 1901; collected by Kumakichi Aoki.

Remarks: There is no holotype designation in the original description. The three specimens of two males and one female used in the original description are syntypes (ICZN Art. 72.1.1, 72.4.1.1). Two specimens were deposited at ZUMT and another one at Columbia University in New York. The information of ZUMT 1449 and ZUMT 1450 in the ZUMT specimen ledger well match with the original description that ZUMT 1449 written as "type female", and ZUMT 1450 as "cotype male". Unfortunately, however, these specimens have not been located at this time, and was judged to have been lost.

原記載にはホロタイプの指定がない。記載に使用した雄 2 個体と雌 1 個体の 3 標本は、シントタイプである (ICZN Art. 72.1.1, 72.4.1.1)。2 標本は ZUMT に、1 標本はニューヨークのコロンビア大学に登録された。ZUMT 標本台帳では、本種に ZUMT 1449 と ZUMT1450 の 2 つが該当し、ZUMT 1449 には「type 雌」、ZUMT1450 には「cotype 雄」の書き込みがある。ただし残念ながら、現時点でこれらの標本は確認できないため、失われたと判断した。

Current status: Valid as *Eptatretus okinoseanus* (Dean, 1904) ムラサキヌタウナギ

Kuo, C.-H., Huang, K.-F. and Mok, H.-K. 1994. Hagfishes of Taiwan (I): A taxonomic revision with description of four new *Paramyxine* species. *Zoological Studies*, 33 (2): 126–139.

McMillan, C. B. and Wisner, R. L. 2004. Review of the hagfishes (Myxinidae, Myxiniformes) of the northwestern Pacific Ocean, with descriptions of three new species, *Eptatretus fernholmi*, *Paramyxine moki*, and *P. walkeri*. *Zoological Studies*, 43 (1): 51–73.

Paramyxine atami Dean, 1904

Original description: Dean (1904): 14, fig. 2D, pl. 1 (figs. 3–5).

Dean, B. 1904. Notes on Japanese myxinoids. A new genus *Paramyxine* and a new species *Homea okinoseanus*. Reference also to their eggs. *Journal of the College of Science. Imperial University, Tokyo*, 19 (2): 1–25, pl. 1.

Syntype (lost): ZUMT 1421 (1, female), off Manazuru Cape (Sagami Bay), Kanagawa Pref., Japan, depth 270 fathoms; June 1901; donated by B. Dean.

Syntype (available): ZUMT 1527 (2, egg capsules), off Atami (Sagami Bay), Kanagawa Pref., Japan; Nov. 1896; collected by Kumakichi Aoki.

Remarks: There is no holotype designation in the original description. The three specimens of one female and two eggshells used in the original description are syntypes (ICZN Art. 72.1.1, 72.4.1.1). In the ZUMT specimen ledger, ZUMT 1421 written as "1 sample, female type", and ZUMT 1527 as "type egg". Unfortunately, however, the female specimen ZUMT 1421 has not been located at this time, and was judged to have been lost.

原記載にはホロタイプの指定がない。記載に使用した雌 1 個体と卵殻 2 個の 3 標本はシタイプである (ICZN Art. 72.1.1, 72.4.1.1)。ZUMT 標本台帳には ZUMT 1421 に「1 標本、female type」、ZUMT 1527 には「type egg」の記述があった。ただし残念ながら、現時点で雌の ZUMT 1421 は確認できないため、失われたと判断した。

Current status: Valid as *Eptatretus atami* (Dean, 1904) クロヌタウナギ

Kuo, C.-H., Huang, K.-F. and Mok, H.-K. 1994. Hagfishes of Taiwan (I): A taxonomic revision with description of four new *Paramyxine* species. *Zoological Studies*, 33 (2): 126–139.

McMillan, C. B. and Wisner, R. L. 2004. Review of the hagfishes (Myxinidae, Myxiniformes) of the northwestern Pacific Ocean, with descriptions of three new species, *Eptatretus fernholmi*, *Paramyxine moki*, and *P. walkeri*. *Zoological Studies*, 43 (1): 51–73.

Lamniformes ネズミザメ目
Mitsukurinidae ミツクリザメ科
Mitsukurina owstoni Jordan, 1898

Original description: Jordan (1898): 200, pls. 11–12.

Jordan, D. S. 1898. Description of a species of fish (*Mitsukurina owstoni*) from Japan, the type of a distinct family of lamnoid sharks. *Proceedings of the California Academy of Sciences (Series 3) Zoology*, 1 (6): 199–204, pls. 11–12.

Holotype (lost): ZUMT 1455 (immature male), off Misaki (Sagami Bay), near Yokohama Market, Kanagawa Pref., Japan; donated by A. Owston in 1897. (明治 30 年 横浜市場 オーストン氏寄贈)

Remarks: This species was described based on one immature male (ICZN Art. 73.1.1). In the ZUMT specimen ledger, ZUMT 1455 written as "*Mitsukurina owstoni* Jordan type", and is holotype of this species. Unfortunately, however, the specimen has not been located at this time, and was judged to have been lost.

この種は未成年の雄 1 個体に基づいて記載された (ICZN Art. 73.1.1)。ZUMT 標本台帳には ZUMT 1455 に「*Mitsukurina owstoni* Jordan type」の記述があった。ただし残念ながら、現時点でこの標本は確認できないため、失われたと判断した。

Current status: Valid as *Mitsukurina owstoni* Jordan, 1898 ミツクリザメ

Bean, B. A. 1905. Notes on an adult goblin shark (*Mitsukurina owstoni*) of Japan. *Proceedings of the United States National Museum*, 28 (1409): 815–818, 8 figs.

Yano, K., Miya, M., Aizawa, M. and Noichi, T. 2007. Some aspects of the biology of the goblin shark, *Mitsukurina owstoni*, collected from the Tokyo Submarine Canyon and adjacent waters, Japan. *Ichthyol Research*, 54: 388–398.

Carcharhiniformes メジロザメ目
Scyliorhinidae トラザメ科
Catulus torazame Tanaka, 1908

Original description: Tanaka (1908): 6, pl. 2 (fig. 2).

Tanaka, S. 1908. Notes on some Japanese fishes, with descriptions of fourteen new species. Journal of the College of Science. Imperial University, Tokyo, 23 (7): 1–54, pls. 1–4.

Holotype (lost): ZUMT 953 (male), off Misaki (Sagami Bay), Kanagawa Pref., Japan; 13 Mar. 1904; “Specimen B” in the measurement table.

Remarks: The original description specified ZUMT 953 as the holotype, and is a specimen of "Specimen B" male in the measurement table. The collection data of ZUMT 953 in the ZUMT specimen ledger well match with the original description. It was written as "Cotype (correction)" and "type (corrected by erasing co of cotype) is in the Owston Collection". Considering this writing as a misunderstanding, the holotype was ZUMT 953. Unfortunately, however, the specimen has not been located at this time, and was judged to have been lost.

The figure (pl. 2, fig. 2) published in the original description and the figure published later in the Figures and descriptions of the fishes of Japan (1: pl. 3, fig 12) by Tanaka (1911) are the same female. This specimen was regarded as a paratype in "Specimen A" of the measurement table (ICZN Art. 72.4.5). This specimen is said to have been collected by Mr. Owston.

原記載はホロタイプに ZUMT 953 を指定した。記載にある計測表の「Specimen B」雄の標本である。ZUMT 標本台帳には ZUMT 953 の収集データは、原記載と同じである。そこには「Cotype (加筆)」と「type (cotype の co を消して修正) は Owston Collection にあり」の書き込みがあった。この書き込を誤解と見なし、ホロタイプは ZUMT 953 である。ただし残念ながら、現時点でこの標本は確認できないため、失われたと判断した。

原記載に掲載された図 (pl. 2, fig. 2) とその後田中 (1911) が日本産魚類図説 (1: pl. 3, fig 12) に掲載した図は同じ雌であり、計測表の「Specimen A」でパラタイプである (ICZN Art. 72.4.5)。この標本は、相模湾 (伊豆大島と伊豆半島) から 1905 年 2 月 6 日にオーストン氏が採集したものである。

Current status: Valid as *Scyliorhinus torazame* (Tanaka, 1908) トラザメ

田中茂穂. 1911. 日本産魚類図説, 1: 1–18, pls. 1–5. (Tanaka, S. 1911. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 1: 1–18, pls. 1–5. [In Japanese and English])

Compagno, L. J. V. 1984. FAO species catalogue. Vol. 4. Sharks of the world. An annotated and illustrated catalogue of shark species known to date. Part 2. Charcharhiniformes. FAO (Food and Agriculture Organization of the United Nations) Fisheries Synopsis No. 125, 4 (2): 251–655.

Shirai, S., Hagiwara, S. and Nakaya, K. 1992. *Scyliorhinus tokubee* sp. nov. from Izu Peninsula, southern Japan (Scyliorhinidae, Elasmobranchii). Japanese Journal of Ichthyology, 39 (1): 9–16.

- Dyldin, Yu. V. 2015. Annotated checklist of the sharks, batoids and chimaeras (Chondrichthyes: Elasmobranchii, Holocephali) from waters of Russia and adjacent areas. Publications of the Seto Marine Biological Laboratory, 43: 40–91.
- Soares, K. D. A. and De Carvalho, M. R. 2019. The catshark genus *Scyliorhinus* (Chondrichthyes: Carcharhiniformes: Scyliorhinidae): taxonomy, morphology and distribution. Zootaxa, 4601 (1): 1–147.
- Ito, N., Fujii, M., Nohara, K. and Tanaka, S. 2022. *Scyliorhinus hachijoensis*, a new species of catshark from the Izu Islands, Japan (Carcharhiniformes: Scyliorhinidae). Zootaxa, 5092 (3): 331–349.

Pentanchidae ヘラザメ科
Scyliorhinus macrorhynchus Tanaka, 1909

Original description: Tanaka (1909): 1.

Tanaka, S. 1909. Descriptions of one new genus and ten new species of Japanese fishes. Journal of the College of Science. Imperial University, Tokyo, 27 (8): 1–27, pl. 1.

Holotype (available): ZUMT 2153 (immature male), off Misaki (Sagami Bay), Kanagawa Pref., Japan; Apr. 1909.

Paratype (lost): ZUMT uncatalogued (1, skin), off Misaki (Sagami Bay), Kanagawa Pref., Japan.

Remarks: The original description specified ZUMT 2153 as the holotype. There is an even larger skin paratype, but has not been located at this time, and was judged to have been lost.

原記載はホロタイプに ZUMT 2153 を指定した。さらに大きな皮のパラタイプがあるものの、現時点でこの標本は確認できないため、失われたと判断した。

Current status: Valid as *Apristurus macrorhynchus* (Tanaka, 1909) ナガヘラザメ

Compagno, L. J. V. 1984. FAO species catalogue. Vol. 4. Sharks of the world. An annotated and illustrated catalogue of shark species known to date. Part 2. Carcharhiniformes. FAO (Food and Agriculture Organization of the United Nations) Fisheries Synopsis No. 125, 4 (2): 251–655.

Nakaya, K. and Séret, B. 1999. A new species of deepwater catshark, *Apristurus albisoma* n. sp. from New Caledonia (Chondrichthyes: Carcharhiniformes: Scyliorhinidae). Cybium, 23 (3): 297–310.

Nakaya, K., Sato, K. and Iglésias, S. P. 2008. Occurrence of *Apristurus melanogaster* from the South Pacific, Indian and South Atlantic oceans (Carcharhiniformes: Scyliorhinidae). CSIRO Marine and Atmospheric Research Paper, 022: 61–74.

Nakaya, K. and Kawachi, J. 2013. A review of the genus *Apristurus* (Chondrichthyes: Carcharhiniformes: Scyliorhinidae) from Taiwanese waters. Zootaxa, 3752 (1): 130–171.

Weigmann, S. 2016. Annotated checklist of the living sharks, batoids and chimaeras (Chondrichthyes) of the world, with a focus on biogeographical diversity. Journal of Fish Biology. 88 (3): 837–1037.

Scyliorhinus platyrhynchus Tanaka, 1909

Original description: Tanaka (1909): 4.

Tanaka, S. 1909. Descriptions of one new genus and ten new species of Japanese fishes. Journal of the College of Science. Imperial University, Tokyo, 27 (8): 1–27, pl. 1.

Holotype (lost): ZUMT 2154 (male), off Misaki (Sagami Bay), Kanagawa Pref., Japan; May 1909.

Remarks: The original description specified ZUMT 2154 as the holotype. Unfortunately, however, the specimen has not been located at this time, and was judged to have been lost.

原記載はホロタイプに ZUMT 2154 を指定した。ただし残念ながら、現時点でこの標本は確認できないため、失われたと判断した。

Current status: Valid as *Apristurus platyrhynchus* (Tanaka, 1909) ヘラザメ

Nakaya, K. and Sato, K. 2000. Taxonomic review of *Apristurus platyrhynchus* and related species from the Pacific Ocean (Chondrichthyes, Carcharhiniformes, Scyliorhinidae). Ichthyological Research, 47 (3): 223–230.

Nakaya, K. and Kawauchi, J. 2013. A review of the genus *Apristurus* (Chondrichthyes: Carcharhiniformes: Scyliorhinidae) from Taiwanese waters. Zootaxa, 3752 (1): 130–171.

Ebert, D. A., White, W. T., Ho, H.-C., Last, P. R., Nakaya, K., Séret, B., Straube, N., Naylor, G. J. P. and de Carvalho, M. R. 2013. An annotated checklist of the chondrichthyans of Taiwan. Zootaxa, 3752 (1): 279–386.

Weigmann, S. 2016. Annotated checklist of the living sharks, batoids and chimaeras (Chondrichthyes) of the world, with a focus on biogeographical diversity. Journal of Fish Biology, 88 (3): 837–1037.

Proscylliidae タイワンザメ科

Calliscyllium venustum Tanaka, 1912 ヒョウザメ

Original description: Tanaka (1912): 171, pl. 46 (figs. 178–183).

田中茂穂. 1912 日本産魚類図説, 10: 165–186, pls. 46–50. (Tanaka, S. 1912 Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 10: 165–186, pls. 46–50. [In Japanese and English])

Holotype (lost): ZUMT 3398 (female), Tokyo Market (Sagami Sea), Tokyo, Japan.

Remarks: The original description specified ZUMT 3398 as the holotype. The holotype was obtained from the Tokyo Market and was produced in Sagami Sea. In addition, the local name

"Hoshinokuri" in Kagoshima prefecture is mentioned. ZUMT 31594 corresponded to the record of ZUMT specimen ledger. However, this specimen was donated in March 1936 and is not a paratype. Unfortunately, we couldn't confirm the holotype at this point, so we decided it was lost.

原記載にはホロタイプに ZUMT 3398 を指定した。ホロタイプは、東京市場から得たもので産地を相模灘とした。また鹿児島県の地方名にホシノクリをあげている。ZUMT 標本台帳の記録に ZUMT 31594 が該当した。しかし、この標本は 1936 年 3 月に寄贈されたもので、パラタイプではない。残念ながら、現時点でホロタイプを確認できないため、失われたと判断した。

Current status: Valid as *Proscyllium venustum* (Tanaka, 1912) ヒョウザメ

Nakaya, K. 1983. Redescription of the holotype of *Proscyllium habereri* (Lamniformes, Triakidae). Japanese Journal of Ichthyology, 29 (4): 469-473.

Compagno, L. J. V. 1984. FAO species catalogue. Vol. 4. Sharks of the world. An annotated and illustrated catalogue of shark species known to date. Part 2. Charcharhiniformes. FAO (Food and Agriculture Organization of the United Nations) Fisheries Synopsis No. 125, 4 (2): 251-655.

益田 一・尼岡邦夫・荒賀忠一・上野輝彌・吉野哲夫編. 1984. 日本産魚類大図鑑. 東海大学出版会, 東京. xx + 448 pp., 370 pls. (Masuda, H., Amaoka, K. Araga, C., Ueno, T. and Yoshino, T. (eds.). 1984. The Fishes of the Japanese Archipelago. Tokai University Press, Tokyo. xx + 448 pp., 370 pls.)

中坊徹次(編). 2013. 日本海産魚類検索全種の同定 I~III 第三版. 東海大学出版会、秦野. 2530pp. (Nakabo, T. (ed.). 2013. Fishes of Japan with pictorial keys to the species I-III, third edition. Tokai University Press, Hadano. 2530pp. In Japanese) Weigmann, S. 2016. Annotated checklist of the living sharks, batoids and chimaeras (Chondrichthyes) of the world, with a focus on biogeographical diversity. Journal of Fish Biology, 88 (3): 837-1037.

Triakididae ドチザメ科

Cynias kanekonis Tanaka, 1916 ソオボオシロザメ

Original description: Tanaka (1916): 27.

田中茂穂. 1916. 日本産魚類の四新種. 動物学雑誌, 28 (327): 26-28. (Tanaka, S. 1916. Four new species of Japanese fishes. Zoological Magazine Tokyo, 28 (327): 26-28. [In Japanese])

Holotype (lost): ZUMT 6360, Nagasaki Market, Nagasaki Pref., Japan; collected by Ichiro Kaneko. (長崎市場, 金子一狼氏採集)

Remarks: There is no holotype designation in the original description. In the ZUMT specimen ledger, ZUMT 6360 is only the specimen which the scientific name and collected data match with the original description, and is judged as a holotype. Unfortunately, however, the specimen has not been located at this time, and was judged to have been lost.

原記載にはホロタイプ指定がない。ZUMT 標本台帳の記録から ZUMT 6360 が学名や収集データが一致した唯一の標本である。ZUMT コレクションにも他に該当する標本がないことから、この標本はホロタイプである (ICZN Art. 73.1.1)。ただし残念ながら、現時点でこの標本は確認できないため、失われたと判断した。

Current status: Synonym of *Mustelus griseus* Pietschmann, 1908 シロザメ

Compagno, L. J. V. 1984. FAO species catalogue. Vol. 4. Sharks of the world. An annotated and illustrated catalogue of shark species known to date. Part 2. Charcharhiniformes. FAO (Food and Agriculture Organization of the United Nations) Fisheries Synopsis 125, 4 (2): 251–655.

White, W. T., S. Arunrugstichai and G. J. P. Naylor. 2021. Revision of the genus *Mustelus* (Carcharhiniformes: Triakidae) in the northern Indian Ocean, with description of a new species and a discussion on the validity of *M. walkeri* and *M. ravidus*. Marine Biodiversity, 51: 42: 1–24.

Squaliformes ツノザメ目

Squalidae ツノザメ科

Cirrhigaleus barbifer Tanaka, 1912 ヒゲズノ

Original description: Tanaka (1912): 151, pl. 41 (figs. 156–162).

田中茂穂. 1912. 日本産魚類図説, 9: 145–164, pls. 41–45. (Tanaka, S. 1912. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 9: 145–164, pls. 41–45. [In Japanese and English])

Holotype (lost): ZUMT 3397 (male), Tokyo Market (Sagami Bay?), Tokyo, Japan.

Remarks: The original description specified ZUMT 3397 as the holotype. Unfortunately, however, the specimen has not been located at this time, and was judged to have been lost.

原記載はホロタイプに ZUMT 3397 を指定した。ただし残念ながら、現時点でこの標本は確認できないため、失われたと判断した。

Current status: Valid as *Cirrhigaleus barbifer* Tanaka, 1912 ヒゲツノザメ

White, W. T., Last, P. R. and Stevens, J. D. 2007. *Cirrhigaleus australis* n. sp., a new Mandarin dogfish (Squaliformes: Squalidae) from the south-west Pacific. Zootaxa, 1560: 19–30.

Ebert, D. A., White, W. T., Ho, H.-C., Last, P. R., Nakaya, K., Séret, B., Straube, N., Naylor, G. J. P. and de Carvalho, M. R. 2013. An annotated checklist of the chondrichthyans of Taiwan. Zootaxa, 3752 (1): 279–386.

Squalus brevirostris Tanaka, 1917 ツマリアイザメ

Original description: Tanaka (1917): 464, pls. 129 (362–363), 130 (364).

田中茂穂. 1917. 日本産魚類図説, 26: 455–474, pls. 126–130. (Tanaka, S. 1917. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 26: 455–474, pls. 126–130. [In Japanese and English])

Holotype (available): ZUMT 7630 (male), Tokyo Market, Tokyo, Japan (probably came from Bakan [Shimonoseki, Yamaguchi Pref.]). (東京市場、おそらく馬関附近 [山口県下関])

Paratype (lost): ZUMT 2406 (1), Fukuoka, Fukuoka Pref., Japan; Apr. 1909; collected by Shigeo Tanaka. (福岡市 明治 42 年 4 月 田中茂穂採集)

Paratype (lost): ZUMT 3715 (1), Tokyo Market, Tokyo, Japan. (probably came from Bakan [Shimonoseki, Yamaguchi Pref.]). (東京市場 [山口県下関])

Paratype (lost): ZUMT 6046 (1), Atsuta Market, Nagoya, Aichi Pref., Japan, 1 May 1915. (愛知県名古屋市熱田市場、大正 4 年 5 月 1 日)

Paratypes (available): ZUMT6047, ZUMT 6048 (2, male), same as ZUMT 6046.

Remarks: The original description specified ZUMT 7630 as the holotype. In addition, descriptions of multiple specimens were found. The collection locality include Nagoya City, Atsuta and Fukuoka City in addition to the Tokyo Market (probably near Bakan [Shimonoseki, Yamaguchi Pref.]). In the ZUMT specimen ledger, there are ZUMT 3715 (Tokyo market [Shimonoseki, Yamaguchi Pref.]), ZUMT 6046 to ZUMT 6048 (Atsuta, Nagoya City) and ZUMT 2406 (Fukuoka) as specimens corresponding to the collection site. These specimens are paratypes (ICZN Art. 72.4.1.1, 72.4.5).

原記載はホロタイプに ZUMT 7630 を指定した。さらに複数標本の記述が見られた。産地には東京市場 (おそらく馬関附近 [山口県下関]) の他に名古屋市熱田と福岡市を含めている。ZUMT 標本台帳には採集地に該当する標本に ZUMT 3715 (東京市場 [山口県下関]), ZUMT 6046~ZUMT 6048 (名古屋市熱田) と ZUMT 2406 (福岡) がある。これらの標本はパラタイプである (ICZN Art. 72.4.1.1, 72.4.5)。

Current status: Valid as *Squalus brevirostris* Tanaka, 1917 ツマリツノザメ

Compagno, L. J. V. 1984. FAO species catalogue. Vol. 4. Sharks of the World. An annotated and illustrated catalogue of shark species known to date. Part 1 - Hexanchiformes to Lamniformes. viii + 249 pp.

Viana, S. T. de F. L., Lisher, M. W. and de Carvalho, M. R. 2017. Two new species of short-snouted dogfish sharks of the genus *Squalus* Linnaeus, 1758, from southern Africa (Chondrichthyes: Squaliformes: Squalidae). Marine Biodiversity, 48: 1787–1814.

Viana, S. T. de F. L. and de Carvalho, M. R. 2020. *Squalus shiraii* sp. nov. (Squaliformes, Squalidae), a new species of dogfish shark from Japan with regional nominal species revisited. Zoosystematics and Evolution, 96 (2): 275–311.

Squalus wakiyae Tanaka, 1918 アイザメ

Original description: Tanaka (1918): 475, pl. 130 (figs. 368–370).

田中茂穂. 1918. 日本産魚類図説, 27: 475–494, pls. 126–130. (Tanaka, S. 1917. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 27: 475–494, pls. 126–130. [In Japanese and English])

Syntype (lost): ZUMT 7632 (1, female), Watanoha, Ishinomaki, Miyagi Pref., 225 m depth; Feb. 1916; collected by Miyagi Fishery Station. (宮城県石巻市渡波)

Syntypes (available): ZUMT 4684 (1, neonate male), ZUMT 4685 (1, neonate female), Tokyo Market, Tokyo, Japan.

Remarks: The original description is a short description of the new species of *Squalus mitsukurii* reported by Tanaka (1917) in the Figures and descriptions of the fishes of Japan (26: 471–474, pl. 130, figs. 368–370). Tanaka (1917) investigated multiple specimens in addition to the illustrated ZUMT 7632. The original description mentioned as "It comes from the Rikuzen Sendai or Shiogama Market that transported to the Tokyo Market.". Based on the ZUMT specimen ledger, ZUMT 4684 and ZUMT 4685 are only the specimen of the species which obtained from the Tokyo Market. Therefore, these specimens are the syntypes (ICZN Art. 72.1.1, 72.4.1.1).

原記載は、田中自身 (1917) の日本産魚類図説 (26: 471–474, pl. 130, figs. 368–370) に報告した *Squalus mitsukurii* を新種にする短い記述である。田中 (1917) は、図示した ZUMT 7632 の他に複数標本を調べている。原記載には、「東京市場に来る陸前仙台又塩釜市場より来るもの」とある。ZUMT 標本台帳の記録から東京市場から入手した標本 ZUMT 4684 と ZUMT 4685 がある。これらの標本はシタイプである (ICZN Art. 72.1.1, 72.4.1.1)。

Current status: Synonym of *Squalus suckleyi* (Girard, 1854) アブラツノザメ

田中茂穂. 1917. 日本産魚類図説, 26: 455–474, pls. 126–130. (Tanaka, S. 1917. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 26: 455–474, pls. 126–130. [In Japanese and English])

Compagno, L. J. V. 1984. FAO species catalogue. Vol. 4. Sharks of the World. An annotated and illustrated catalogue of shark species known to date. Part 1 - Hexanchiformes to Lamniformes. viii + 249 pp.

Viana, S. T. de F. L., de Carvalho, M. R. and Gomes, U. L. 2016. Taxonomy and morphology of species of the genus *Squalus* Linnaeus, 1758 from the southwestern Atlantic Ocean (Chondrichthyes: Squaliformes: Squalidae). Zootaxa, 4133 (1): 1–89.

Viana, S. T. de F. L. and de Carvalho, M. R. 2020. *Squalus shiraii* sp. nov. (Squaliformes, Squalidae), a new species of dogfish shark from Japan with regional nominal species revisited. Zoosystematics and Evolution, 96 (2): 275–311.

Centrophoridae アイザメ科
Lepidorhinus kinbei Tanaka, 1918 キンベエザメ

Original description: Tanaka (1918): 99.

田中茂穂. 1918. 日本産魚類の二新種. 動物学雑誌, 30 (353): 99–100. (Tanaka, S. 1918. Two new species of Japanese fishes. Zoological Magazine Tokyo, 30 (353): 99–100. [In Japanese])

Holotype (available): ZUMT 12349 (female), body skin and head, Tokyo Market (Sagami Bay?), Tokyo, Japan.

Remarks: There is no holotype designated by the original description, and there is no record of the corresponding specimen in the ZUMT specimen ledger. However, a single specimen (ZUMT 12349, Squalidae in ZUMT specimen ledger) with head and whole-body skin was found from the ZUMT collection during the present investigation, and the morphology of fins, shape of the scales, and number of the dentitions (16 and 17 on the right and left sides of the maxilla, respectively; 13 and 14 on the right and left sides of the mandible, respectively), were well match with the original description. In addition, the total length of the specimen was 1410 mm, and was almost same as the original description. Although, this specimen lacking collection data on the ZUMT specimen ledger, “sketch number 365” in Tanaka’s handwriting. From these facts, it was judged to be a holotype of *Lepidorhinus kinbei* Tanaka, 1918 (ICZN Art. 73.1.2).

Compagno (1984) reported *Lepidorhinus kinbei* Tanaka, 1918 as a junior synonym for *Centrophorus squamosus* (Bonnaterre, 1788) with a question mark. As a result of examination of the holotype ZUMT 12349 of *Lepidorhinus kinbei* Tanaka, 1918, the morphology of the holotype was well corresponded with known diagnosis of *Centrophorus squamosus* (Bonnaterre, 1788).

The scientific name of this species is names in honor of the collector Kinbe. The original spelling "*hinbei*" is considered as a misspelling of "*kinbei*" and is an incorrect original spelling. Incorrect spelling is corrected from "*hinbei*" to "*kinbei*" (ICZN Art. 31.1.1, 32.5.1).

原記載にはホロタイプの指定がなく、ZUMT 標本台帳に該当する標本の記録がない。しかし、今回の調査の過程で ZUMT コレクションにある大型の頭部と尾鰭の残る皮が発見された (ZUMT 12349、台帳には Squalidae と記録されている)。この標本を調べた結果、各鰭の形態と鱗の形状、さらに歯列数は上顎の右側 16 本、左側 17 本、下顎の右側 13 本、左側 14 本と原記載に書かれた特徴とよく一致した。また、全長は 1410 mm であり、これも概ね一致する。また、標本台帳には産地に関する情報がなかったものの、田中自筆で「写生 365 号」と書かれていた。これらのことから *Lepidorhinus kinbei* Tanaka, 1918 のホロタイプと判断した (ICZN Art. 73.1.2)。

Compagno (1984)は、*Lepidorhinus kinbei* Tanaka, 1918 をモミジザメ *Centrophorus squamosus* (Bonnaterre, 1788)のジュニアシノニムとして疑問符をつけて報告した。今回、発見された *L. kinbei* のホロタイプ ZUMT 12349 を観察した結果、その形態はモミジザメ *Centrophorus squamosus* (Bonnaterre, 1788)の識別的特徴と良く一致した。

本種の学名は、採集者の金兵衛 (Kinbe) に由来している。原綴り”hinbei”は、”kinbei”のスペルミスと見なされ、不正な原綴りとなる。不正な原綴りは”hinbei” は”kinbei”にと修正される (ICZN Art. 31.1.1, 32.5.1)。

- Current status: Synonym of *Centrophorus squamosus* (Bonnaterre, 1788) モミジザメ
- Compagno, L. J. V. 1984. FAO species catalogue. Vol. 4. Sharks of the World. An annotated and illustrated catalogue of shark species known to date. Part 1 - Hexanchiformes to Lamniformes. viii + 249 pp.
- 中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I~III 第三版. 東海大学出版会、秦野. 2428 pp. [Nakabo, T. (ed.). 2013. Fishes of Japan with pictorial keys to the species, I-III, third edition. Tokai University Press, Hadano. xlix + 2428 pp. (In Japanese)]
- Weigmann, S. 2016. Annotated checklist of the living sharks, batoids and chimaeras (Chondrichthyes) of the world, with a focus on biogeographical diversity. *Journal of Fish Biology*, 88 (3): 837-1037.

Etmopteridae カラスザメ科

Centroscyllium kamoharai Abe, 1966 ハダカカスミザメ

- Original description: Abe (1966): 190, figs. 1-8.
- Abe, T. 1966. Description of a new squaloid shark, *Centroscyllium kamoharai*, from Japan. *Japanese Journal of Ichthyology*, 13 (4): 190-198.
- Holotype (lost): ZUMT 52310 (female), off Yaizu (Suruga Bay), Shizuoka Pref., Japan, deep-water line-fishing; 8 Sept. 1964.
- Paratype (lost): ZUMT 52311(1, female), same locality as holotype; 26 Nov. 1964.
- Paratype (lost): ZUMT 52312 (1, female), same locality as holotype; Feb. 1964.

- Current status: Valid as *Centroscyllium kamoharai* Abe, 1966 ハダカカスミザメ
- Compagno, L. J. V. 1984. FAO species catalogue. Vol. 4. Sharks of the World. An annotated and illustrated catalogue of shark species known to date. Part 1 - Hexanchiformes to Lamniformes. i-viii + 1-249.
- Ebert, D. A., White, W. T., Ho, H.-C., Last, P. R., Nakaya, K., Séret, B., Straube, N., Naylor, G. J. P. and de Carvalho, M. R. 2013. An annotated checklist of the chondrichthyans of Taiwan. *Zootaxa*, 3752 (1): 279-386.
- Weigmann, S. 2016. Annotated checklist of the living sharks, batoids and chimaeras (Chondrichthyes) of the world, with a focus on biogeographical diversity. *Journal of Fish Biology*, 88 (3): 837-1037.

Somniosidae オンデンザメ科
Heteroscymnus longus Tanaka, 1912 カエルザメ

Original description: Tanaka (1912): 102, pl. 26.

田中茂穂. 1912. 日本産魚類図説, 6: 87–108, pls. 25–30. (Tanaka, S. 1912. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 6: 87–108, pls. 25–30. [In Japanese and English])

Holotype (lost): ZUMT 3204 (female), Tokyo Market (Sagami Bay?), Tokyo, Japan.

Remarks: The original description specified ZUMT 3204 as the holotype. The specimen is lost.
原記載はホロタイプに ZUMT 3204 を指定した。標本は紛失している。

Current status: Valid as *Somniosus longus* (Tanaka, 1912) カエルザメ

Yano, K., Stevens, J. D. and Compagno, L. J. V. 2004. A review of the systematics of the sleeper shark genus *Somniosus* with redescrptions of *Somniosus (Somniosus) antarcticus* and *Somniosus (Rhinoscymnus) longus* (Squaliformes: Somniosidae). Ichthyological Research, 51 (4): 360–373.

Dyldin, Yu. V. 2015. Annotated checklist of the sharks, batoids and chimaeras (Chondrichthyes: Elasmobranchii, Holocephali) from waters of Russia and adjacent areas. Publications of the Seto Marine Biological Laboratory, 43: 40–91.

Weigmann, S. 2016. Annotated checklist of the living sharks, batoids and chimaeras (Chondrichthyes) of the world, with a focus on biogeographical diversity. Journal of Fish Biology, 88 (3): 837–1037.

Torpediniformes シビレエイ目
Torpedinidae ヤマトシビレエイ科
Tetronarcine tokionis Tanaka, 1908= ***Tetronarce tokionis*** Tanaka, 1908

Original description: Tanaka (1908): 2, figured.

Tanaka, S. 1908. Notes on some Japanese fishes, with descriptions of fourteen new species. Journal of the College of Science. Imperial University, Tokyo, 23 (7): 1–54, pls. 1–4.

Holotype (lost): ZUMT 917 (female, 95 cm TL, specimen A), Tokyo Market, Tokyo, Japan; 19 Dec. 1905.

Paratypes (lost): ZUMT uncatalogued (1, female, 80 cm TL, specimen B), off Misaki (Sagami Bay), Kanagawa Pref., Japan; 11 Mar. 1906.

Paratype (lost): ZUMT uncatalogued (1, female, 81 cm TL, specimen C), off Odawara (Sagami Bay), Kanagawa Pref., Japan; 12 Mar. 1904.

Remarks: The original description was based on 3 specimens containing holotype ZUMT 917. Other than ZUMT 917, there is no record in the ZUMT specimen ledger. These specimens are regarded as lost.

Tanaka (1908: 3) referred to two species, *T. occidentalis* and *T. californica*, of North America from Jordan and Evermann (1896. Fishes of North and Middle America. Part 1: 77). The spelling of the genus is unknown because the genus name was abbreviated. However, the genus name of Jordan and Evermann (1896: 77) quoted is *Tetronarce*, and are meaning that Tanaka (1908: 2) mistakenly spelled *Tetronarce* as *Tetronarcine*. Even if it is published in combination with such an incorrect spelling of the genus name (here, an error), it is considered to be published in combination with the correct original spelling of the genus name (ICZN Art. 11.9.3.2). A legitimate modified name replaces the incorrect original spelling and retains the authorship and date of the scientific name at the time of establishment as the correct original spelling (ICZN Art. 19.2).

原記載はホロタイプ ZUMT 917 を含む 3 標本を基にした。ZUMT 917 以外、ZUMT 標本台帳に記録はない。これらの標本は紛失している。

田中 (1908: 3) は、原記載の中で Jordan and Evermann (1896. Fishes of North and Middle America. Part 1: 77) の北米産 *T. occidentalis* と *T. californica* の 2 種を参考にした。属名が省略されているため、その属のつづりは不明である。引用した Jordan and Evermann (1896: 77) の属名は *Tetronarce* である。田中 (1908: 2) は誤って *Tetronarce* のつづりを *Tetronarcine* と綴った。このような属名の不正な綴り (ここでは、誤記) に結合して公表されたとしても、属名の正しい原綴りに結合して公表されたものと見なされる (ICZN Art. 11.9.3.2)。正当な修正名は、不正な原綴りに取って代わり、正しい原綴りとして設立時の学名の著者権と日付を保持する (ICZN Art. 19.2.)

Current status: Valid as *Tetronarce tokionis* Tanaka, 1908 ヤマトシビレエイ

de Carvalho, M. R., Stehmann, M. F. W. and Manilo, L. G. 2002. *Torpedo adenensis*, a new species of electric ray from the Gulf of Aden, with comments on nominal species of *Torpedo* from the western Indian Ocean, Arabian Sea, and adjacent areas (Chondrichthyes: Torpediniformes: Torpedinidae). *American Museum Novitates*, 3369: 1–34.

Haas, D. L. and Ebert, D. A. 2006. *Torpedo formosa* sp. nov., a new species of electric ray (Chondrichthyes: Torpediniformes: Torpedinidae) from Taiwan. *Zootaxa*, 1320: 1–14.

Ebert, D. A., White, W. T., Ho, H.-C., Last, P. R., Nakaya, K., Séret, B., Straube, N., Naylor, G. J. P. and de Carvalho, M. R. 2013. An annotated checklist of the chondrichthyans of Taiwan. *Zootaxa*, 3752 (1): 279–386.

萬代あゆみ・松沼瑞樹・本村浩之. 2017. 日本初記録のヤマトシビレエイ科魚類ツキミシビレエイ (新称) *Tetronarce formosa* と本種の標徴に関する新知見, および近縁種との形態比較. *魚類学雑誌*, 64 (2): 157–170. (Bandai A., M. Matsunuma and H. Motomura. 2017. First records of the electric ray *Tetronarce formosa* (Torpediniformes: Torpedinidae) from Japan, with a revised species' diagnosis and comparisons with congeners. *Japanese Journal of Ichthyology*, 64 (2): 157–170. [In Japanese with English abstract])

Rajiformes ガンギエイ目
Arhynchobatidae ヒトツビレカスベ科
Bathyraja pseudoisotrachys Ishihara & Ishiyama, 1985 ソコガンギエイ

Original description: Ishihara and Ishiyama (1985): 165, figs. 18 (A–B).

Ishihara, H. and R. Ishiyama. 1985. Two new North Pacific skates (Rajidae) and a revised key to *Bathyraja* in the area. Japanese Journal of Ichthyology, 32 (2): 143–179.

Holotype (available): ZUMT 14571 (male), off Muroran, Hokkaido, Japan; collected by Jutaro Katsukui.

Current status: Valid as *Bathyraja pseudoisotrachys* Ishihara & Ishiyama, 1985 ソコガンギエイ
田中茂穂. 1927. 日本産魚類図説, 35: 645–676, pls. 154–155. (Tanaka, S. 1927. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 35: 645–676, pls. 154–155. [In Japanese and English])

Ebert, D. A. and L. J. V. Compagno. 2007. Biodiversity and systematics of skates (Chondrichthyes: Rajiformes: Rajoidei). Environmental Biology of Fishes, 80 (2–3): 111–124.

Dyldin, Yu. V. 2015. Annotated checklist of the sharks, batoids and chimaeras (Chondrichthyes: Elasmobranchii, Holocephali) from waters of Russia and adjacent areas. Publications of the Seto Marine Biological Laboratory, 43: 40–91.

Weigmann, S. 2016. Annotated checklist of the living sharks, batoids and chimaeras (Chondrichthyes) of the world, with a focus on biogeographical diversity. Journal of Fish Biology, 88 (3): 837–1037.

Raja kujiensis Tanaka, 1916 クジカスベ

Original description: Tanaka (1916): 173.

田中茂穂. 1916. 日本産魚類の四新種. 動物学雑誌, 28 (331): 173–174. (Tanaka, S. 1916. Four new species of Japanese fishes. Zoological Magazine Tokyo, 28 (331): 173–174. [In Japanese])

Holotype (lost): ZUMT uncatalogued, off Kuji, Iwate Pref., Japan.

Remarks: There is no holotype designated by the original description. There is no specimen in the ZUMT specimen ledger which match with the original description.

原記載にホロタイプの指定がない。ZUMT 標本台帳に該当する標本の記録がなく、ZUMT コレクションにも記載に一致する標本は見当たらない。

Current status: Valid as *Rhinoraja kujiensis* (Tanaka, 1916) クジカスベ

- Stevenson, D. E., Orr, J. W., Hoff, G. R. and McEachran, J. D. 2004. *Bathyraja mariposa*: a new species of skate (Rajidae: Arhynchobatinae) from the Aleutian Islands. *Copeia*, 2004 (2): 305–314.
- Ebert, D. A. and Compagno, L. J. V. 2007. Biodiversity and systematics of skates (Chondrichthyes: Rajiformes: Rajoidei). *Environmental Biology of Fishes*, 80 (2–3): 111–124.
- Dyldin, Yu. V. 2015. Annotated checklist of the sharks, batoids and chimaeras (Chondrichthyes: Elasmobranchii, Holocephali) from waters of Russia and adjacent areas. *Publications of the Seto Marine Biological Laboratory*, 43: 40–91.

Rajidae ガンギエイ科
Raja karagea Tanaka, 1927 サメカラゲア

Original description: Tanaka (1927): 784.

田中茂穂. 1927. 日本産魚類図説, 40: 757–784, pls. 167–169. (Tanaka, S. 1927. Figures and descriptions of the fishes of Japan, including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea and southern Sakhalin. Maruzen, Tokyo. Vol. 40: 757–784, pls. 167–169. [In Japanese and English])

Holotype (available): ZUMT 13853 (male), Kesen, Rikuzen, Iwate Pref., Japan; donated by G. Toba.

Paratype (available): ZUMT 14570 (1, male), Muroran, Hokkaido, Japan; Mar. 1925.

Remarks: "*Raja tobae* Tanaka, 1927" has been replaced with "*Raja karagea* Tanaka, 1927" because it has the same primary name as "*Raja tobae* Tanaka, 1916". (ICZN 57.2 72.8)

「サメカラゲア *Raja tobae* Tanaka, 1927」は、「トバカスベ *Raja tobae* Tanaka, 1916」の一次同名のため代用名として「*Raja karagea* Tanaka, 1927」に置換された。(ICZN 57.2 72.8)

Current status: Synonym of *Okamejei kenojei* (Bürger in Müller & Henle, 1841) コモンカスベ 田中茂穂. 1927. 日本産魚類図説, 35: 645–676, pls. 154–155. (Tanaka, S. 1927. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 35: 645–676, pls. 154–155. [In Japanese and English])

Ishihara, H. 1987. Revision of the western North Pacific species of the genus *Raja*. *Japanese Journal of Ichthyology*, 34 (3): 241–285.

Dyldin, Yu. V. 2015. Annotated checklist of the sharks, batoids and chimaeras (Chondrichthyes: Elasmobranchii, Holocephali) from waters of Russia and adjacent areas. *Publications of the Seto Marine Biological Laboratory*, 43: 40–91.

Weigmann, S. 2016. Annotated checklist of the living sharks, batoids and chimaeras (Chondrichthyes) of the world, with a focus on biogeographical diversity. *Journal of Fish Biology*, 88 (3): 837–1037.

Raja katsukii Tanaka, 1927 サラサカスベ

Original description: Tanaka (1927): 662, pl. 154 (figs. 426–428).

田中茂穂. 1927. 日本産魚類図説, 35: 645–676, pls. 154–155. (Tanaka, S. 1927. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 35: 645–676, pls. 154–155. [In Japanese and English]).

Holotype (available): ZUMT 13755 (female), western Mutsu, Aomori Pref., Japan.

Current status: Synonym of *Okamejei kenojei* (Bürger in Müller & Henle, 1841) コモンカスベ

Ishihara, H. 1987. Revision of the western North Pacific species of the genus *Raja*. Japanese Journal of Ichthyology, 34 (3): 241–285.

Dyldin, Yu. V. 2015. Annotated checklist of the sharks, batoids and chimaeras (Chondrichthyes: Elasmobranchii, Holocephali) from waters of Russia and adjacent areas. Publications of the Seto Marine Biological Laboratory, 43: 40–91.

Weigmann, S. 2016. Annotated checklist of the living sharks, batoids and chimaeras (Chondrichthyes) of the world, with a focus on biogeographical diversity. Journal of Fish Biology, 88 (3): 837–1037.

Dyldin, Yu. V. and Orlov, A. M. 2018. An annotated list of cartilaginous fishes (Chondrichthyes: Elasmobranchii, Holocephali) of the coastal waters of Sakhalin Island and the adjacent southern part of the Sea of Okhotsk. Journal of Ichthyology, 58 (2): 158–180.

Raja tobae Tanaka, 1916 トバカスベ, ザンギエ

Original description: Tanaka (1916): 313.

田中茂穂. 1916. 日本産魚類の一新種. 動物学雑誌, 28 (334): 313–314. (Tanaka, S. 1916. A new species of Japanese fish. Zoological Magazine Tokyo, 28 (334): 313–314. [In Japanese])

Lectotype (lost): ZUMT 7443 (male), Toba, Mie Pref., Japan; July 1916; collected by Shigeo Tanaka and Mansaku Kobayashi. (志摩國鳥羽 大正 5 年 7 月 田中茂穂および小林萬作採集)

Paralectotype (lost): ZUMT 7446 (1: female), same as holotype.

Remarks: The original description was based on two specimens, male and female. From the records in the ZUMT specimen ledger, males of ZUMT 7443 and females of ZUMT 7446 were applicable. These specimens are syntypes (ICZN Art. 72.4.1.1, 73.2.). The Figures and descriptions of the fishes of Japan (25–26: 453–455, pl. 124–126) by Tanaka (1917) designated

the male ZUMT 7443 as a holotype and re-described and illustrated this specimen together with the female specimen ZUMT 7446. The act of selecting a specific specimen from this syntype as the name-bearing type (here, the holotype) is regarded as the designation of the lectotype (ICZN 74.5). Therefore, ZUMT 7443 and ZUMT 7446 are regarded as lectotype and paralectotype, respectively. Unfortunately, however, the specimen has not been located at this time, and was judged to have been lost.

原記載は雄と雌の2標本に基づいて記載した。ZUMT 標本台帳の記録から ZUMT 7443 の雄と ZUMT 7446 の雌が該当した。これらの標本はシントタイプとなる (ICZN Art. 72.4.1.1, 73.2)。田中 (1917) の日本産魚類図説 (25–26: 453–455, pl. 124–126) は、雄の ZUMT 7443 をホロタイプに指定し、雌の ZUMT 7446 とともに再記載し、図示した。この行為は、シントタイプの中から担名タイプ (ここでは、ホロタイプ) の選定となり、ホロタイプの固定ではなくレクトタイプの指定と見なされる (ICZN Art. 74.5)。したがって、ZUMT 7443 はレクトタイプに、ZUMT 7446 はパラレクトタイプとなる (ICZN Art. 73.2.2)。ただし残念ながら、現時点でこの標本は確認できないため、失われたと判断した。

Current status: Synonym of *Okamejei kenojei* (Bürger in Müller & Henle, 1841) コモンカスベ
田中茂穂. 1917. 日本産魚類図説, 25: 441–454, pls. 121–125. (Tanaka, S. 1917. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 25: 441–454, pls. 121–125. [In Japanese and English])

田中茂穂. 1917. 日本産魚類図説, 26: 455–474, pls. 126–130. (Tanaka, S. 1917. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 26: 455–474, pls. 126–130. [In Japanese and English])

Ishihara, H. 1987. Revision of the western North Pacific species of the genus *Raja*. Japanese Journal of Ichthyology, 34 (3): 241–285.

Dyldin, Yu. V. 2015. Annotated checklist of the sharks, batoids and chimaeras (Chondrichthyes: Elasmobranchii, Holocephali) from waters of Russia and adjacent areas. Publications of the Seto Marine Biological Laboratory, 43: 40–91.

Weigmann, S. 2016. Annotated checklist of the living sharks, batoids and chimaeras (Chondrichthyes) of the world, with a focus on biogeographical diversity. Journal of Fish Biology, 88 (3): 837–1037.

Chimaeriformes ギンザメ目

Chimaeridae ギンザメ科

Chimaera jordani Tanaka, 1905

Original description: Tanaka (1905): 2, pl. 1 (fig. 1).

Tanaka, S. 1905. On two new species of *Chimaera*. Journal of the College of Science. Imperial University, Tokyo, 20 (11): 1–14, pls. 1–2.

Syntype (lost): ZUMT 915 (1, male), off Inatori (Sagami Sea), Izu Peninsula, Shizuoka Pref. Japan; donated by A. Owston 13 Feb. 1905. (♂ Type 伊豆沖 [伊豆と大島の間] 明治 38 年 2 月 13 日 オーストン氏寄贈)

Syntype (lost): ZUMT 915 (1, female), Tokyo Market, Japan; Feb. 1905. (♀ Type 明治 38 年 2 月 東京市場)

Non-type (lost): ZUMT 915 (1, immature female), Tokyo Market, Japan; Feb. 1905. (♀ not type 明治 38 年 2 月 東京市場)

Remarks: The original measurement table is based on a total of 16 individuals, including 4 males and 12 females, including specimens borrowed from Mr. Alan Owston. Two specimens, one male and one female, were registered as types in the ZUMT collection. These 16 specimens are syntypes (ICZN Art. 72.4.1.1, 73.2). ZUMT 915 is a specimen that matches *Chimaera jordani* Tanaka from the records in the ZUMT specimen ledger. The three specimens of ZUMT 915 are "♂ Type off Izu (between Izu and Oshima), donated by Mr. Owston on February 13, 1905", "♀ Type February 1905. Tokyo Market" and "♀ not type February 1905 Tokyo Market".

The figure published in Tanaka (1911)'s Figures and descriptions of the fishes of Japan (3: 42–44, pl. 10, fig. 31) is a male specimen collected by Mr. Owston and is the same as the original figure. It is not holotype designation. Unfortunately, however, these specimens have not been located at this time, and was judged to have been lost.

原記載の測定表には、アラン・オーストン氏から借用した標本を含む雄 4 個体、雌 12 個体の計 16 個体に基づいている。雌雄各 1 個体の 2 標本がタイプとして ZUMT コレクションに登録された。これらの 16 標本はシントタイプである (ICZN Art. 72.4.1.1, 73.2)。

ZUMT 915 は、ZUMT 標本台帳の記録から *Chimaera jordani* Tanaka に一致した標本である。ZUMT 915 の 3 標本は、「♂ Type 伊豆沖 (伊豆と大島の間) 明治 38 年 2 月 13 日 オーストン氏寄贈」、「♀ Type 明治 38 年 2 月 東京市場」、「♀ not type 明治 38 年 2 月 東京市場」である。

田中 (1911) の日本産魚類図 (3: 42–44, pl. 10, fig. 31) に掲載した図は、オーストン氏採集の雄の標本で原記載の図と同じである。ホロタイプの指定ではない。ただし残念ながら、現時点でこれらの標本は確認できないため、失われたと判断した。

Current status: Valid as *Chimaera jordani* Tanaka, 1905 ジョルダンギンザメ

田中茂穂. 1911. 日本産魚類図, 2: 19–34, pls. 6–10. (Tanaka, S. 1911. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 2: 19–34, pls. 6–10. [In Japanese and English])

田中茂穂. 1911. 日本産魚類図, 3: 35–50, pls. 11–15. (Tanaka, S. 1911. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 3: 35–50, pls. 11–15. [In Japanese and English])

Didier, D. A. 1995. Phylogenetic systematics of extant chimaeroid fishes (Holocephali, Chimaeroidei). American Museum Novitates, 3119: 1–86.

Weigmann, S. 2016. Annotated checklist of the living sharks, batoids and chimaeras (Chondrichthyes) of the world, with a focus on biogeographical diversity. Journal of Fish Biology, 88 (3): 837–1037.

Chimaera mitsukurii Dean, 1904

Original description: Dean (1904): 6, pl. 1 (figs. 1–2).

Dean, B. 1904. Notes on *Chimaera*. Two Japanese species, *C. phantasma* Jordan and Snyder and *C. mitsukurii* n. s., and their egg cases. Journal of the College of Science. Imperial University, Tokyo, 19 (3): 1–9, pl. 1.

Syntype (lost): ZUMT 1457 (1, adult male), off Misaki (Sagami Bay), Kanagawa Pref., Japan; June 1901; presented by B. Dean.

Syntype (lost): ZUMT 1473 (2, egg cases), Sengenzuka, off Misaki (Sagami Bay), Kanagawa Pref., Japan; Jan. 1897; collected by Kumakichi Aoki. (千間塚内 明治30年1月 青木熊吉採集)

Remarks: There is no holotype designation in the original description. In the original description, one adult male and two egg cases were registered in ZUMT, and an immature female and two egg cases were registered in Columbia University. These specimens are syntypes (ICZN Art. 72.4.1.1, 73.2). In the records of the ZUMT specimen ledger, the adult male ZUMT 1457 and the two egg cases ZUMT 1473 were applicable. The ZUMT 1457 record in the ZUMT specimen ledger says "♂ Type". Unfortunately, however, these specimens have not been located at this time, and was judged to have been lost.

原記載にはホロタイプの指定がない。原記載では、ZUMT に雄の成魚 1 個体と卵殻 2 個が、コロンビア大学に雌未成魚と卵殻 2 個が登録された。これらの標本はシントタイプである (ICZN Art. 72.4.1.1, 73.2)。ZUMT 標本台帳の記録では、雄成魚の ZUMT 1457 と卵殻 2 個の ZUMT 1473 が該当した。ZUMT 標本台帳の ZUMT 1457 の記録には、「♂ Type」と書かれている。ただし残念ながら、現時点でこれらの標本は確認できないため、失われたと判断した。

Current status: Synonym of *Hydrolagus mitsukurii* (Jordan & Snyder, 1904) アカギンザメ Jordan, D. S. and Snyder, J. O. 1904. On the species of white chimaera from Japan. Proceedings of the United States National Museum, 27 (1356): 223–226.

Didier, D. A. 1995. Phylogenetic systematics of extant chimaeroid fishes (Holocephali, Chimaeroidei). American Museum Novitates, 3119: 1–86.

Dyldin, Yu. V. 2015. Annotated checklist of the sharks, batoids and chimaeras (Chondrichthyes: Elasmobranchii, Holocephali) from waters of Russia and adjacent areas. Publications of the Seto Marine Biological Laboratory, 43: 40–91.

Weigmann, S. 2016. Annotated checklist of the living sharks, batoids and chimaeras (Chondrichthyes) of the world, with a focus on biogeographical diversity. Journal of Fish Biology, 88 (3): 837–1037.

Chimaera owstoni Tanaka, 1905

Original description: Tanaka (1905): 10, pl. 1 (figs. 2–3).

Tanaka, S. 1905. On two new species of *Chimaera*. Journal of the College of Science. Imperial University, Tokyo 20 (11): 1–14, pls. 1–2.

Lectotype (lost): ZUMT 916 (male), Tokyo Market, Japan; Mar. 22, 1906; collected by Shigeho Tanaka.

Paralectotype (lost): ZUMT 916 (1, female), same as lectotype.

Remarks: There is no holotype designation in the original description. Since the description is based on one male and one female, these are syntypes (ICZN Art. 72.4.1.1, 73.2). From the record of the ZUMT specimen ledger, it was described that the corresponding ZUMT 916 included two individuals, male (type) and female. In Tanaka's (1911) Figures and descriptions of the fishes of Japan (1: 18–19, pl. 5, figs. 17–18), a male ZUMT 916 was selected as the holotype and re-described. This act is regarded as the designation of the lectotype, not the selection of the name-bearing type (here, the holotype) from the syntypes (ICZN 74.5). The female of the specimen ZUMT 916 is of the paralectotype (ICZN Art. 73.2.2). Unfortunately, however, these specimens have not been located at this time, and was judged to have been lost.

原記載にはホロタイプの指定がない。記載は、雄1個体と雌1個体に基づいているため、これらはシントタイプとなる (ICZN Art. 72.4.1.1, 73.2)。ZUMT 標本台帳の記録から該当した ZUMT 916 には雄 (type) と雌の2個体が含まれる記述であった。

田中 (1911) の日本産魚類図説 (1: 18–19, pl. 5, figs. 17–18) では、ホロタイプに ZUMT 916 の雄を選定し、再記載した。この行為は、シントタイプの中から担名タイプ (ここでは、ホロタイプ) の選定ではなく、レクトタイプの指定と見なされる (ICZN 74.5)。標本 ZUMT 916 の雌は、パラレクトタイプとなる (ICZN Art. 73.2.2)。ただし残念ながら、現時点でこれらの標本は確認できないため、失われたと判断した。

Current status: Valid as *Chimaera owstoni* Tanaka, 1905 シロブチギンザメ

田中茂穂. 1911. 日本産魚類図説, 1: 1–18, pls. 1–5. (Tanaka, S. 1911. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 1: 1–18, pls. 1–5. [In Japanese and English])

Didier, D. A. 1995. Phylogenetic systematics of extant chimaeroid fishes (Holocephali, Chimaeroidei). American Museum Novitates, 3119: 1–86.

Didier, D. A., Last, P. R. and White, W. T. 2008. Three new species of the genus *Chimaera* Linnaeus (Chimariformes: Chimaeridae) from Australia. In: Descriptions of new Australian Chondrichthyans. CSIRO Marine and Atmospheric Research Paper, 22: 327–339.

Dyldin, Yu. V. 2015. Annotated checklist of the sharks, batoids and chimaeras (Chondrichthyes: Elasmobranchii, Holocephali) from waters of Russia and adjacent areas. Publications of the Seto Marine Biological Laboratory, 43: 40–91.

Weigmann, S. 2016. Annotated checklist of the living sharks, batoids and chimaeras (Chondrichthyes) of the world, with a focus on biogeographical diversity. Journal of Fish Biology, 88 (3): 837–1037.

Chimaera spilota Tanaka, 1908

Original description: Tanaka (1908): 15.

Tanaka, S. 1908. Notes on some Japanese fishes, with descriptions of fourteen new species. Journal of the College of Science. Imperial University, Tokyo, 23 (7): 1–54, pls. 1–4.

Holotype (lost): ZUMT 961 (female, 57 cm TL, as Specimen B), off Miyako, Japan; 1903; donated by Y. Wakiya in 1906.

Paratype (lost): ZUMT 954 (1, female, as Specimen A), off Miyako, Iwate Pref., Japan; 1903.

Paratype (lost): ZUMT uncatalogued (1, male, as Specimen C), locality and date unknown.

Remarks: This type series consists of three specimens from off the coast of Rikuchu Miyako, two females and one male of unknown origin. ZUMT 961 (female, 57 cm TL) was specified as the holotype. In the records of the ZUMT specimen ledger, ZUMT 961 had only the scientific name, and ZUMT 954 had holotype specimen data. In addition, there is a note written as "Be careful with this (ZUMT 954) and ZUMT 961. Or replace the specimens with each other." This suggests the replacement of ZUMT 954 and ZUMT 961 specimens. Changed the collection data of the specimen. Unfortunately, however, these specimens have not been located at this time, and was judged to have been lost.

この種のタイプシリーズは、陸中宮古沖から雌2個体と産地不明の雄1個体の3標本である。ホロタイプにZUMT 961 (female, 57 cm TL)を指定した。ZUMT 標本台帳の記録では、ZUMT 961 は学名のみ、ZUMT 954 にはホロタイプの標本データがあった。さらに「これ(ZUMT 954)とZUMT 961 には注意。或いは標本を互いに入れ替えるべし」との書き込みがある。これはZUMT 954 とZUMT 961 の標本の入れ替えを示唆したものである。標本の採集データを変更した。ただし残念ながら、現時点でこれらの標本は確認できないため、失われたと判断した。

Current status: Synonym of *Hydrolagus barbouri* (Garman, 1908) ココノホシギンザメ

田中茂穂. 1908. 魚類雑話 (三十一) ココノホシギンザメの学名変更. 動物学雑誌, 20 (236): 201.

田中茂穂. 1911. 日本産魚類図説, 1: 1–18, pls. 1–5. (Tanaka, S. 1911. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 1: 1–18, pls. 1–5. [In Japanese and English])

Didier, D. A. 1995. Phylogenetic systematics of extant chimaeroid fishes (Holocephali, Chimaeroidei). American Museum Novitates, 3119: 1–86.

Dyldin, Yu. V. 2015. Annotated checklist of the sharks, batoids and chimaeras (Chondrichthyes: Elasmobranchii, Holocephali) from waters of Russia and adjacent areas. Publications of the Seto Marine Biological Laboratory, 43: 40–91.

Weigmann, S. 2016. Annotated checklist of the living sharks, batoids and chimaeras (Chondrichthyes) of the world, with a focus on biogeographical diversity. Journal of Fish Biology, 88 (3): 837–1037.

Rhinochimaeridae テングギンザメ科
Anteliochimaera chaetirhamphus Tanaka, 1909

Original description: Tanaka (1909): 7, pl. 1.

Tanaka, S. 1909. Descriptions of one new genus and ten new species of Japanese fishes. Journal of the College of Science. Imperial University, Tokyo, 27 (8): 1–27, pl. 1.

Holotype (lost): ZUMT 2155 (male), outside of Okinose, off Misaki (Sagami Bay), Kanagawa Pref., Japan, depth 400 fathoms; Dec. 1908; collected by Kumakichi Aoki. (沖の瀬外側、400 尋 明治 41 年 12 月 青木熊吉採集)

Remarks: The original description specified ZUMT 2155 as the holotype. Unfortunately, however, this specimen has not been located at this time, and was judged to have been lost.

原記載はホロタイプに ZUMT 2155 を指定した。ただし残念ながら、現時点でこの標本は確認できないため、失われたと判断した。

Current status: Valid as *Harriotta chaetirhamphus* (Tanaka, 1909) アズマギンザメ

田中茂穂. 1911. 日本産魚類図説, 1: 1–18, pls. 1–5. (Tanaka, S. 1911. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 1: 1–18, pls. 1–5. [In Japanese and English])

Okamura, O. and Machida, Y. 1986. Additional records of fishes from Kochi Prefecture, Japan. Memoirs of the Faculty of Science, Kochi University (Ser. D) (Biology), 7: 17–41.

Didier, D. A. 1995. Phylogenetic systematics of extant chimaeroid fishes (Holocephali, Chimaeroidei). American Museum Novitates, 3119: 1–86.

Nakayama, N., Matsunuma, M. and Endo, H. 2019. A preliminary review and in situ observations of the spookfish genus *Harriotta* (Holocephali: Rhinochimaeridae). Ichthyological Research, 67 (1): 82–91.

Harriotta pacifica Mitsukuri, 1895 テングギンザメ

Original description: (Mitsukuri, 1895): 97, pl. 16.

Mitsukuri, K. 1895. On a new genus of the chimaeroid group *Hariotta*. Zoological Magazine Tokyo, 7 (80): 97–98, pl. 16.

Syntype (lost): ZUMT 1453 (1, female), off Kurihama, Yokosuka City, Kanagawa Pref., Uraga Strait, Japan. Apr. 19, 1883.

Syntype (lost): ZUMT 1454 (1, male), Sengenzuka, off Misaki (Sagami Bay), Kanagawa Pref., Japan, 450 fathoms; collected with longline (Mutsu Nawa); purchased from Kumakichi Aoki. (千間塚、三崎 明治 31 年 5 月 4 日 延縄 (ムツ縄) にて採集、450 尋。青木熊吉より購入)

Remarks: There is no holotype designation in the original description. There were two records in the ZUMT specimen ledger, ZUMT 1453 (1, female type) and ZUMT 1454 (1, male cotype), which matched the original name. These specimens are syntypes (ICZN Art. 72.4.1.1, 73.2). Unfortunately, however, this specimen has not been located at this time, and was judged to have been lost. Didier and Nakaya (1999) designated the neotype as CBM-ZF 6140 (Natural History Museum and Institute, Chiba, Japan).

原記載にホロタイプ指定がない。ZUMT 標本台帳の記録には、原記載名に一致した ZUMT 1453 (1, female type) と ZUMT 1454 (1, male cotype) の 2 つがあった。これらの標本はシタイプである (ICZN Art. 72.4.1.1, 73.2)。ただし残念ながら、現時点でこの標本は確認できないため、失われたと判断した。Didier and Nakaya (1999) は、ネオタイプに CBM-ZF 6140 (Natural History Museum and Institute, Chiba, Japan) を指定した。

Current status: Valid as *Rhinochimaera pacifica* (Mitsukuri, 1895) テングギンザメ

箕作佳吉. 1895. ギンザメの 1 新属に就いて. 動物学雑誌, 7 (80): 182–184, pl. 16.

Dean, B. 1904 Notes on the long-snouted chimaeroid of Japan, *Rhinochimaera* (*Harriotta*) *Pacifica* (Garman) Mitsukuri. Journal of the College of Science. Imperial University, Tokyo, 19 (4): 1–20, 2 pls.

田中茂穂. 1914. 日本産魚類図説, 16: 263–278, pls. 76–80. (Tanaka, S. 1914. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 16: 263–278, pls. 76–80. [In Japanese and English])

Didier, D. A. 1995. Phylogenetic systematics of extant chimaeroid fishes (Holocephali, Chimaeroidei). American Museum Novitates, 3119: 1–86.

Didier, D. A. and Nakaya, K. 1999. Redescription of *Rhinochimaera pacifica* (Mitsukuri) and first record of *R. africana* Compagno, Stehmann & Ebert from Japan (Chimaeriformes: Rhinochimaeridae). Ichthyological Research, 46 (2): 139–152.

Dyldin, Yu. V. 2015. Annotated checklist of the sharks, batoids and chimaeras (Chondrichthyes: Elasmobranchii, Holocephali) from waters of Russia and adjacent areas. Publications of the Seto Marine Biological Laboratory, 43: 40–91.

Weigmann, S. 2016. Annotated checklist of the living sharks, batoids and chimaeras (Chondrichthyes) of the world, with a focus on biogeographical diversity. Journal of Fish Biology, 88 (3): 837–1037.

Acipenseriformes チョウザメ目

Acipenseridae チョウザメ科

Acipenser kikuchii Jordan & Snyder, 1901

Original description: Jordan and Snyder (1901): 302, pl. 15 (figs. 1–2).

Jordan, D. S. and Snyder, J. O. 1901. Descriptions of nine new species of fishes contained in museums of Japan. Journal of the College of Science. Imperial University, Tokyo, 15 (2): 301–311, pls. 15–17.

Holotype (available): ZUMT 946 (stuffed), off Misaki (Sagami Bay), Kanagawa Pref., Japan; May 1895; collected with gill-net; collected by Kumakichi Aoki.

Remarks: The original description is based on only one specimen without information of catalog number. In the ZUMT specimen ledger, ZUMT 946 is the only specimen whose scientific name and collection data matched with the original description. ZUMT 946 closely matches the stuffed specimen in the original figure (pl. 15, figs. 1–2). This specimen is judged as holotype.

原記載は1標本のみに基づいている。ZUMT 946は、ZUMT 標本台帳の記録から学名と採集データが一致する唯一の標本である。ZUMT 946は、原記載の図 (pl. 15, figs. 1–2) のはく製標本によく一致するため、この標本をホロタイプと判断した。

Current status: Synonym of *Acipenser sinensis* Gray, 1835 カラチョウザメ

Birstein, V. J. and W. E. Bemis. 1997. How many species are there within the genus *Acipenser*?. *Environmental Biology of Fishes*, 48 (1–4): 157–163.

Takeuchi, T. 1979. Description of two acipenserid fishes, *Acipenser sinensis* Gray and *A. kikuchii* Jordan et Snyder, recorded from Sagami Bay. *Annual Report of Keikyu Aburatsubo Marine Park*, 10: 20–25 (in Japanese).

Acipenser multiscutatus Tanaka, 1908

Original description: Tanaka (1908): 21, pl. 2 (fig. 1)

Tanaka, S. 1908. Notes on some Japanese fishes, with descriptions of fourteen new species. *Journal of the College of Science. Imperial University, Tokyo*, 23 (7): 1–54, pls. 1–4.

Holotype (lost): ZUMT 955 (stuffed), 7 miles off Ukedo-Hama, Province of Iwaki, Japan; 21 May 1905; collected with gill-net. (福島県磐城請戸浜沖、刺し網、1905年5月21日)

Remarks: The original description specified the holotype as ZUMT 955. The holotype is a stuffed specimen that larger than 2 m standard length and is not found in the ZUMT collection. In addition to the holotype, the original description states "Two, more or less imperfect skin of the same species purchased of a fish-merchant in Tokyo, are contained in the Imperial Museum of Tokyo." There is no information about them.

原記載はホロタイプを ZUMT 955 に指定した。ホロタイプは標準体長 2 m を超えるはく製標本であり、ZUMT コレクションには見当たらない。また、原記載にはホロタイプの他に次の様に述べている「Two, more or less imperfect skin of the same species purchased of a fish-merchant in Tokyo, are contained in the Imperial Museum of Tokyo.」が、それらに関する情報はない。

Current status: Synonym of *Acipenser schrenckii* Brandt, 1869 アムールチョウザメ

- 田中茂穂. 1912. 日本産魚類図説. 7: 109–128, pls. 31–35. (Tanaka, S. 1912. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 7: 109–128, pls. 31–35. [In Japanese and English])
- Masuda, H., Amaoka, K., Araga, C., Uyeno, T. and Yoshino, T. 1984. The fishes of the Japanese Archipelago. Tokyo (Tokai University Press). Text: i–xxii + 1–437, Atlas: pls. 1–370.
- Dyldin, Yu. V. and Orlov, A. M. 2016. Ichthyofauna of fresh and brackish waters of Sakhalin Island: an annotated list with taxonomic comments: 1. Petromyzontidae--Clupeidae families. *Journal of Ichthyology*, 56 (4): 534–555.

Collection of the previous fish type catalog

Fish types deposited in the Department of Zoology, The University Museum, The University of Tokyo - Part 1: Anguiliformes

Masahiro Aizawa, Keita Koeda, Harutaka Hata, Kazuo Sakamoto, Rei Ueshima

The University Museum, The University of Tokyo Material Reports, 128: 137–149.

Ophichthidae ウミヘビ科

Ophichthus roseus Tanaka, 1917 バラヘビウナギ

Original description: Tanaka (1917): 39.

田中茂穂. 1917. 日本産魚類の六新種. 動物学雑誌, 29 (340): 37–40. (Tanaka, S. 1917.

Six new species of Japanese fishes. Zoological Magazine Tokyo, 29 (340): 37–40. [In Japanese])

Syntype (available): ZUMT 7485, Tokyo Market, Japan. (東京市場)

Syntype (lost): ZUMT 7486, Tokyo Market, Japan.

Remarks: There is no holotype designation in the original description. ZUMT 7485 and ZUMT 7486 are two specimens whose scientific names and collected data match the records in the ZUMT specimen ledger. In the record of ZUMT specimen ledger of ZUMT 7485, there is an addition to "7485 type" written by Tanaka. This writing is not necessarily evidence that the ZUMT 7485 is fixed to the holotype (ICZN Art. 72.4.7). Therefore, these specimens are syntypes (ICZN Art. 72.4.1.1). Tanaka (1927) reports this species as a synonym for *Ophichthus urolophus* (Temminck & Schlegel, 1846). The figure (pl. 170, fig. 471) posted is ZUMT 7485.

原記載にホロタイプの指定がない。ZUMT 7485 と ZUMT 7486 は、ZUMT 標本台帳の記録に学名と採集データが一致する 2 標本である。ZUMT 7485 の ZUMT 標本台帳には、田中の書いた「7485 タイプ」との加筆がある。この書き込みは、ZUMT 7485 がホロタイプに固定されているという証拠であるとは限らない (ICZN Art. 72.4.7)。そのため、これらの標本はシントタイプである (ICZN Art. 72.4.1.1)。田中 (1927) は本種を *Ophichthus urolophus* (Temminck & Schlegel, 1846) のシノニムとして報告している。掲載された図 (pl. 170, fig. 471) は、ZUMT 7485 である。

Fish types deposited in the Department of Zoology, The University Museum, The University of Tokyo – Part 3: Clupeiformes, Notacanthiformes, Argentiniformes, Stomiiformes, Cypriniformes, Aulopiformes, Gadiformes, and Ophidiiformes.

東京大学総合研究博物館動物部門収蔵の魚類タイプ標本—第3部：ニシン目、ソコギス目、ニギス目、ワニトカゲギス目、コイ目、ヒメ目、タラ目、アシロ目

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Abstract

The current status of type specimens of Clupeiformes, Notacanthiformes, Argentiniformes, Stomiiformes, Cypriniformes, Aulopiformes, Gadiformes, and Ophidiiformes in the ZUMT collection were investigated with recourse to original descriptions, information tags on specimens, and/or the ZUMT specimen ledger. Of the 29 holotypes, 5 syntypes, 1 lectotype, 44 paratypes and 3 paralectotypes purported to be in the collection and applicable to 41 species in 18 families, only 24 holotypes, 4 syntypes, 1 lectotype, 42 paratypes and 3 paralectotypes have been located to date.

Introduction

The current designation and status of type specimens in the fish collection, preserved in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT) collection is now under review. The present list is a summary of type specimens of Clupeiformes, Notacanthiformes, Argentiniformes, Stomiiformes, Cypriniformes, Aulopiformes, Gadiformes, and Ophidiiformes currently held.

本研究では、ZUMT コレクションに収蔵されるタイプ標本の現状について整理するとともに、タイプ指定に関する議論もおこなった。本リストは、ZUMT に含まれるタイプ標本のうちニシン目、ソコギス目、ニギス目、ワニトカゲギス目、コイ目、ヒメ目、タラ目、アシロ目の魚類についてまとめたものである。

Materials and Methods

The “available” type specimens of Clupeiformes, Notacanthiformes, Argentiniformes, Stomiiformes, Cypriniformes, Aulopiformes, Gadiformes, and Ophidiiformes in the ZUMT

collection were confirmed by the first author. They are currently stored in Room 407 in the museum building. The ZUMT collection also includes a variety of personal specimens acquired by the late Tokiharu Abe, such being identifiable in the first instance by an underlined number on the specimen tag. Although those specimens were at no time registered into the ZUMT collection, they are treated here as ZUMT ABE XXXX.

The systematic arrangement of families generally follows Nelson (2006), with species arranged in alphabetical order by species name. The present list includes all the available information pertinent to the ZUMT specimens, including that taken from the ZUMT specimen ledger and/or tags on the specimens.

Information from original description: scientific name, publication, Japanese name in the original description.

Current status on types: available or lost.

Information on type specimens: ZUMT catalog number (number of specimens when more than two), field number or previous catalog number if available, sex, preservation status (stuffed or skin only indicated), collection locality, collection date, collector or donator, collection method, typographical error.

Remarks: Authority for determining type status, correction of previously published erroneous information, and newly determined information from specimen registers and tags.

Current status of species: synonyms, current scientific name and standard Japanese name.

Reference: publications cited in remarks or basis for current status. Listed for each species.

第一著者により、ZUMT に所在するニシン目、ソコギス目、ニギス目、ワニトカゲギス目、コイ目、ヒメ目、タラ目、アシロ目魚類のタイプ標本が確認された。本タイプリストにおいて確認と示した標本は博物館の 407 号室に保管されている。ZUMT コレクションには、故阿部宗明の個人標本が混在しており、これらは基本的に標本タグに書かれた番号に下線が付されていることで識別可能である。これら阿部氏の標本は、ZUMT コレクションに登録されていないものの、本リストにおいては ZUMT ABE ○○○○として扱った。

科の体系的な順番は、主に Nelson (2006) に従い、種については学名のアルファベット順に示した。本リストでは、ZUMT 標本に基づき（あるいは基づいたと想定される）記載されたニシン目、ソコギス目、ニギス目、ワニトカゲギス目、コイ目、ヒメ目、タラ目、アシロ目魚類に関する以下の情報を可能な限り示した。また ZUMT 標本台帳や標本のタグから読み取れる情報についても含めた。

原記載の情報：学名、記載された出版物、記載時に与えられた和名。

タイプ標本の確認状況：確認または未確認。

タイプ標本の情報：ZUMT 番号（複数の場合は標本数）、フィールド番号または寄贈前の他機関登録番号、性別、保存の状態（剥製または皮膚のみの場合に記載）、採集場所、採集年月日、採集者または寄贈者、採集方法など。標本台帳から読み取れる新たな情報についても可能な限り記した。

備考：該当標本をタイプと判断した根拠、ZUMT のタイプ標本が誤って引用された情報、本研究で新たに確認された標本台帳やタグに関する情報、入力ミスなどについて必要に応じて記した。

種の現状：シノニム関係および適用されている学名と標準和名。

引用文献：備考または現状の根拠として引用された出版物や報告論文を種ごとに示した。

Type specimens of Clupeiformes, Notacanthiformes, Argentiniformes, Stomiiformes, Cypriniformes, Aulopiformes, Gadiformes, and Ophidiiformes in ZUMT

Based on the original descriptions, tags on the specimens, and the ZUMT specimen ledger, type specimens of 41 species of Clupeiformes, Notacanthiformes, Argentiniformes, Stomiiformes, Cypriniformes, Aulopiformes, Gadiformes, and Ophidiiformes in 18 families, including 29 holotypes, 5 syntypes, 1 lectotype, 44 paratypes, and 3 paralectotypes, were purported to be in the ZUMT collection. 24 holotypes, 4 syntypes, 1 lectotype, 42 paratypes, and 3 paralectotypes, have been confirmed as “available” to date.

原記載、標本のタグおよび ZUMT 台帳の情報などから ZUMT コレクションに所蔵されるニシン目、ソコギス目、ニギス目、ワニトカゲギス目、コイ目、ヒメ目、タラ目、アシロ目魚類標本には 18 科 41 種タイプ標本が登録（あるいは未登録）されていることが明らかになった。その内訳はホロタイプ 29 標本、シントタイプ 5 標本、レクトタイプ 1 標本、パラタイプ 44 標本、パラレクトタイプ 3 標本である。本研究において、これらのうち現在 ZUMT に所在することが確認できたものはホロタイプ 24 標本、シントタイプ 4 標本、パラタイプ 42 標本、パラレクトタイプ 3 標本である。

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Clupeiformes ニシン目

Engraulidae カタクチイワシ科

Thrissina katana Hata, Lavoué & Motomura, 2022 チョセンタレクチ

Original description: Hata, Lavoué and Motomura (2022): 8, figs. 3b, 7–8.

Hata, H., Lavoué S. and Motomura, H. 2022. *Thrissina katana* sp. nov., a new thryssa from the western Pacific Ocean, and redescription of *Thrissina hamiltonii* (Gray, 1835) (Teleostei: Clupeiformes: Engraulidae). *Marine Biodiversity*, 52 (11): 1–18.

Paratype (available): ZUMT 14968 (1), Tainan, Taiwan, collected by Takeo Aoki.

Current status: Valid as *Thrissina katana* Hata, Lavoué & Motomura, 2022 チョウセンタレクチ

Hata, H., Koeda, K., Aizawa, M., Sakamoto, K. and Ueshima, R. 2022. A list of Clupeiformes (Actinopterygii: Teleostei) specimens deposited in the Department of Zoology, the University Museum, the University of Tokyo. The University Museum, The University of Tokyo Material Reports, 128 (1): 17–58.

Notacanthiformes ソコギス目

Halosauridae トカゲギス科

Halosaurus sinensis Abe, 1974

Original description: Abe (1974): 2, pl. I, figs. 1–4.

Abe, T. 1974. Notes on some fishes collected by the fisheries research vessel "Kaiyomaru" in the South China Sea. I. Uo (Japanese Society of Ichthyologists), 22 (1): 1–6.

Holotype (lost): ZUMT 53061, South China Sea (20°25.2'N, 116°07.3'E); 695–720 m depth; 23 May 1971.

Current status: Valid as *Halosaurus sinensis* Abe, 1974

Pais, A., Merella, P., Follesa, M. C. and Motomura, H. 2009. North-eastern record of *Halosaurus ovenii* (Actinopterygii: Notacanthiformes: Halosauridae) in the Mediterranean Sea, with notes on its biology. Acta Ichthyologica et Piscatoria, 39 (1): 33–37.

中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Argentiniformes ニギス目

Microstomatidae ギンザケイワシ科

Nansenia robusta Abe, 1976

Original description: Abe (1976): 27, figs. 1–6.

Abe, T. 1976. Notes on some fishes collected by the fisheries research vessel "Kaiyomaru" in the South China Sea. IV. Bulletin of the Biogeographical Society of Japan, 31 (4): 27–31.

Holotype (available): ZUMT 53953, South China Sea (20°25.7'–20°25.2'N, 116°10.5'–116°07.3'E); 695–720 m depth; 23 May 1971.

Current status: Valid as *Nansenia robusta* Abe, 1976

Kawaguchi, K. and Butler, J. L. 1984. Fishes of the genus *Nansenia* (Microstomatidae) with descriptions of seven new species. Contributions in Science (Los Angeles), 352: 1–22.

Alepocephalidae セキトリイワシ科
Aleposomus watasei Tanaka, 1909

Original description: Tanaka (1909): 14.

Tanaka, S. 1909. Descriptions of one new genus and ten new species of Japanese fishes. Journal of the College of Science. Imperial University, Tokyo, 27 (8): 1–27, pl. 1.

Holotype (available): ZUMT 2147, Okinose, off Misaki (Sagami Sea), Kanagawa Pref., Japan; 700 fathoms depth; Feb. 1908; collected by Kumakichi Aoki.

Paratype (available): ZUMT 2148 (1, female), Okinose, off Misaki (Sagami Sea), Kanagawa Pref., Japan; 700 fathoms depth; Feb. 1908; collected by Kumakichi Aoki. (This specimen is also the holotype of *Rouleina tanakae* Parr, 1951)

Remarks: The paratype ZUMT 2148 is also the holotype of *Rouleina tanakae* Parr, 1951.
パラタイプ ZUMT 2148 は、*Rouleina tanakae* Parr, 1951 のホロタイプでもある。

Current status: Synonym of *Rouleina squamilatera* (Alcock, 1898) セキトリイワシ
岡村 収・北島忠弘 (編). 1984. 沖縄舟状海盆及び周辺海域の魚類 I. 日本水産資源保護協会、東京. 414 pp. [Okamura, O. and Kitajima, T. (eds). 1984. Fishes of the Okinawa Trough and the adjacent water I. Japan Fishery Resources on Conservation Association, Tokyo. 414 pp. (In Japanese and English)]

Okamura, O. and Machida, Y. 1986. Additional records of fishes from Kochi Prefecture, Japan. Memoirs of the Faculty of Science, Kochi University (Series D) (Biology), 7: 17–41.

Sazonov, Yu. I. and Williams, A. 2001. A review of the alepocephalid fishes (Argentiniformes, Alepocephalidae) continental slope of Australia. Journal of Ichthyology, 41 (supplement 1): S1–S36. (Published only in English)

中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Leptoderma lubricum Abe, Marumo & Kawaguchi, 1965 ナメライワシ

Original description: Abe, Marumo and Kawaguchi (1965): 69, figs. 1–4.

Abe, T., Marumo, R. and Kawaguchi, K. 1965. Description of a new alepocephalid fish from Suruga Bay. Japanese Journal of Ichthyology, 13 (1–3): 69–72.

Holotype (available): ZUMT 55047 [ex ORIT 642], Suruga Bay, Shizuoka Pref., Japan (34° 52'N, 138°48'E); 0–1300 m depth; 16 Aug. 1964.

Remarks: Abbreviation of the holotype, ORIT is an abbreviation for Ocean Research Institute, University of Tokyo. The holotype was transferred to the ZUMT collection and registered as ZUMT 55046.

ホロタイプの標本略号 ORIT は Ocean Research Institute, University of Tokyo の略号。ZUMT に移管され、ZUMT 55046 に登録された。

Current status: Valid as *Leptoderma lubricum* Abe, Marumo & Kawaguchi, 1965 ナメライワシ

Shinohara, G., Sato, T., Aonuma, Y., Horikawa, H., Matsuura, K., Nakabo T. and Sato, K. 2005. Annotated checklist of deep-sea fishes from the waters around the Ryukyu Islands, Japan. Deep-sea fauna and pollutants in the Nansei Islands. Monographs of the National Science Museum Tokyo, 29: 385–452.

中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Angulo, A., Baldwin, C. C. and Robertson, D. R. 2016. A new species of *Leptoderma* Vaillant, 1886 (Osmeriformes: Alepocephalidae) from the Pacific coast of Central America. Zootaxa, 4066 (4): 493–500.

Rouleina tanakae Parr, 1951

Original description: Parr (1951): 14.

Parr, A. E. 1951. Preliminary revision of the Alepocephalidae, with the introduction of a new family, Searsidae. American Museum Novitates, 1531: 1–21.

Holotype (available): ZUMT 2148 (1, female), Okinose, off Misaki (Sagami Sea), Kanagawa Pref., Japan; 700 fathoms depth; Feb. 1908; collected by Kumakichi Aoki. (This specimen is also a paratype of *Aleposomus watasei* Tanaka, 1909)

Remarks: The holotype ZUMT 2148 is also a paratype of *Aleposomus watasei* Tanaka, 1909. ホロタイプ ZUMT 2148 は、*Aleposomus watasei* Tanaka, 1909 のパラタイプでもある。

Current status: Valid as *Rouleina guentheri* (Alcock, 1892) タナカセキトリイワシ

Uyeno T. and Kishida, S. 1977. The second specimen of the alepocephalid fish, *Rouleina tanakae*, collected of Kyushu, Japan. Japanese Journal of Ichthyology, 24 (2): 141–143.

岡村 収・北島忠弘 (編). 1984. 沖縄舟状海盆及び周辺海域の魚類 I. 日本水産資源保護協会, 東京. 414 pp. [Okamura, O. and Kitajima, T. (eds). 1984. Fishes of the Okinawa Trough and the adjacent water I. Japan Fishery Resources on Conservation Association, Tokyo. 414 pp. (In Japanese and English)]

Okamura, O. and Machida, Y. 1986. Additional records of fishes from Kochi Prefecture, Japan. Memoirs of the Faculty of Science, Kochi University (Ser. D) (Biology), 7: 17–41.

- Sazonov, Yu. I. and Williams, A. 2001. A review of the alepocephalid fishes (Argentiniformes, Alepocephalidae) continental slope of Australia. *Journal of Ichthyology*, 41 (suppl. 1): S1–S36. [Published only in English]
- 中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Platyroctidae ハナメイワシ科
Sagamichthys abei Parr, 1953

Original description: Parr (1953): 6, fig. 1.

Parr, A. E. 1953. A new genus of Searsidae from Japan. *American Museum Novitates*, 1628: 1–7.

Holotype (available): ZUMT 47820, Yodomi, Sagami Bay, Japan; 22 Apr. 1909; donated by A. Owston.

Remarks: Tanaka (1910) reported *Bathytroctes rostratus* Günther, 1878 on the basis of ZUMT 47820 with suggesting a new Japanese name “Haname-iwashi”.

田中(1910)は、ZUMT47820に基づき *Bathytroctes rostratus* Günther, 1878 を報告し、和名ハナメイワシを提唱した。

Current status: Valid as *Sagamichthys abei* Parr, 1953 ハナメイワシ

田中茂穂. 1910. 二種の深海魚に就いて. *動物学雑誌*, 22 (258): 251–256. [Tanaka, S. 1910. On two species of deep-sea fishes. *Zoological Magazine Tokyo*, 22 (258): 251–256. (In Japanese)]

藤田惣吉・西野耕一郎. 1964. 宮古沖より採集されたハナメイワシ *Sagamichthys abei* について. *魚類学雑誌*, 12(1–2): 7–9. [Fujita, S. and Nishino, K. 1964. On *Sagamichthys abei* collected off Miyako, Iwate Pref., Japan. *Japanese Journal of Ichthyology*, 12(1–2): 7–9. (In Japanese)]

Matsui, T. and Rosenblatt, R. H. 1987. Review of the deep-sea fish family Platyroctidae (Pisces: Salmoniformes). *Bulletin of the Scripps Institution of Oceanography of the University of California*, 26: vii + 1–159.

Matsui, T. 1991. Description of young of the mesopelagic platyroctids *Holtbyrnia latifrons* and *Sagamichthys abei* (Pisces, Alepocephaloidea) from the northeastern Pacific Ocean. *Fishery Bulletin*, 89 (2): 209–219.

中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Stomiiformes ワニトカゲギス目
Sternoptychidae ムネエソ科
Ichthyococcus elongatus Imai, 1941 シンジュエソ

Original description: Imai (1941): 234, fig. 1.

Imai, S. 1941. Seven new deep-sea fishes obtained in Sagami Sea and Suruga Bay. Japanese Journal of Zoology, 9 (2): 233–250.

Holotype (available): ZUMT 55033, Sagami Bay, Shizuoka Pref., Japan (35°09'N, 139°24'E); 26 July 1940; collected with 9 m otter trawl with 1200 m wire, intermediate haul.

Remarks: The original description was based on only one specimen. This specimen was found in a fish specimen transferred from the Mitsui Institute for Marine Biology to ZUMT, and was a specimen that matched the original figure (fig. 1) and body size. This specimen is a holotype and was enrolled in the ZUMT 55033 of the ZUMT collection (ICZN Art. 73.1.1).

原記載では、1 標本のみに基づいて記載された。この標本は、三井海洋生物学研究所から ZUMT に移管された魚類標本から発見され、原記載の図 (fig. 1) や体のサイズに一致する標本であった。この標本はホロタイプであり、ZUMT コレクションの ZUMT 55033 に登録された(ICZN Art. 73.1.1)。

Current status: Valid as *Ichthyococcus elongatus* Imai, 1941 シンジュエソ

Mukhacheva, V. A. 1980. A review of the genus *Ichthyococcus* Bonaparte (Photichthyidae). Voprosy Ikhtiologii, 20 (6): 771–786. [In Russian. English translation published in Journal of Ichthyology, 20 (6), 1981:1–14.]

岡村 収・尼岡邦夫・三谷文夫 (編). 1982. 九州—パラオ海嶺ならびに土佐湾の魚類. 日本水産資源保護協会, 東京. 436 pp. [Okamura, O., Amaoka, K. and Mitani, F. (eds). 1982. Fishes of the Kyushu-Palau Ridge and Tosa Bay. The intensive research of unexploited fishery resources on continental slopes. Japan Fisheries Resource Conservation Association, Tokyo. 435 pp. (In Japanese and English)]

益田 一・尼岡邦夫・荒賀忠一・上野輝彌・吉野哲夫 (編). 1984. 日本産魚類大図鑑. 東海大学出版会, 東京. xx + 448 pp., 370 pls. [Masuda, H., Amaoka, K. Araga, C., Ueno, T. and Yoshino, T. (eds). 1984. The Fishes of the Japanese Archipelago. Tokai University Press, Tokyo. xx + 448 pp., 370 pls.]

中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Astronesthidae トカゲハダカ科
Diplolychnus pacificus Imai, 1941 フタツボシエソ

Original description: Imai (1941): 235, figs. 2–3.

Imai, S. 1941. Seven new deep-sea fishes obtained in Sagami Sea and Suruga Bay. Japanese Journal of Zoology, 9 (2): 233–250.

Holotype (available): ZUMT 55038, Suruga Bay, Shizuoka Pref., Japan (34°47–54'N, 138°38–39'E); 20 Oct. 1940; collected with 4 m beam trawl with 1500 m wire.

Paratypes (available): ZUMT 55039, ZUMT 55040 (2), Suruga Bay, Shizuoka Pref., Japan (34°47–54'N, 138°38–39'E); 20 Oct. 1940; collected with 4 m beam trawl with 1500 m wire.

Paratypes (available): ZUMT 55041, ZUMT 55042, ZUMT 55043 (3), Suruga Bay, Shizuoka Pref., Japan (35°04'N, 138°43'E–34°55'N, 139°24.5'E); 863–1000 m depth; 27 Sept. 1940; collected with 4 m beam trawl with 1400 m wire.

Paratypes (available): ZUMT 55044, ZUMT 55045 (2), Sagami Bay, Shizuoka Pref., Japan (35°02'N, 139°15.5'E); 17 Jan. 1941; collected with 4 m beam trawl with 1800 m wire.

Remarks: The original description was based on eight specimens including holotypes. These type specimens were found in fish specimens transferred from the Mitsui Marine Biology Research Institute to ZUMT. The holotype is specified by body size and the original figure (figs. 2–4). The only specimen that matched it was registered in ZUMT 55038 in the ZUMT collection. The other seven individuals were also paratypes and were registered in ZUMT 55039 – ZMT 55045 (ICZN Art. 72.4.5).

原記載は、ホロタイプを含む 8 標本に基づいて記載された。これらの標本は、三井海洋生物学研究所から ZUMT に移管された魚類標本から発見された。ホロタイプは、体サイズと原記載の図(figs. 2–4)によって原指定されている。それに一致した唯一の標本を ZUMT コレクションの ZUMT 55038 に登録した。その他の 7 個体もパラタイプであり、ZUMT 55039–ZMT 55045 に登録した(ICZN Art. 72.4.5)。

Current status: Valid as *Borostomias pacificus* (Imai, 1941) フタツボシエソ

Gibbs, R. H., Jr. 1964. Family Astronesthidae. pp. 311–350. In: Bigelow, H. B., Breder, C. M., Cohen, D. M., Mead, G. W., Merriman, D., Olsen, Y. H., Schroeder, W. C., Schultz, L. P. and Tee-Van, J. (eds). Fishes of the Western North Atlantic. Vol. 1. Part 4. Memoir of the Sears Foundation for Marine Research, Yale University, New Haven.

岡村 収・北島忠弘 (編). 1984. 沖縄舟状海盆及び周辺海域の魚類 I. 日本水産資源保護協会, 東京. 414 pp. [Okamura, O. and Kitajima, T. (eds) 1984. Fishes of the Okinawa Trough and the adjacent water I. Japan Fishery Resources on Conservation Association, Tokyo. 414 pp. (In Japanese and English)]

Okamura, O. and Machida, Y. 1986. Additional records of fishes from Kochi Prefecture, Japan. Memoirs of the Faculty of Science, Kochi University (Series D) (Biology), 7: 17–41.

中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Melanostomiidae ホテイエソ科

Leptostomias multifilis Imai, 1941 ヤリホシエソ

Original description: Imai (1941): 241, figs. 8–9.

Imai, S. 1941. Seven new deep-sea fishes obtained in Sagami Sea and Suruga Bay. Japanese Journal of Zoology, 9 (2): 233–250.

Holotype (available): ZUMT 55035, Suruga Bay, Shizuoka Pref., Japan (34°47–54'N, 138°38'E–139°24'E); 20 Oct. 1940; collected with 4 m beam trawl with 1500 m wire.

Paratype (available): ZUMT 55036 (1), same as holotype.

Remarks: The types were discovered in a fish specimen transferred from the Mitsui Institute of Marine Biology to ZUMT. The original description was based on two specimens, holotype and paratype. The holotype is originally specified by the figure (figs. 8 & 9) described in the original and the body size. The only specimen with the same body size was registered as a holotype in the ZUMT 55035 of the ZUMT collection. One paratype was confirmed, and it was registered in ZUMT 55036.

この種はホロタイプとパラタイプ 2 標本、合わせて 3 標本に基づいて記載されている。三井海洋生物学研究所から ZUMT に移管された魚類標本の中から 2 個体が発見された。確認できた標本の 1 つは体サイズが原記載の図(figs. 8 & 9)に一致しているホロタイプである(ICZN Art. 73.1.1)。このホロタイプを ZUMT コレクションの ZUMT 55035 に登録した。残った標本はパラタイプの 1 個体である(ICZN Art. 72.4.5)。そのパラタイプは ZUMT 55036 に登録された。

Current status: Valid as *Leptostomias multifilis* Imai, 1941 ヤリホシエソ

Morrow, J. E., Jr. and Gibbs, R. H., Jr. 1964. Family Melanostomiidae. pp. 351–511. In: Bigelow, H. B., Breder, C. M., Cohen, D. M., Mead, G. W., Merriman, D., Olsen, Y. H., Schroeder, W. C., Schultz, L. P. and Tee-Van, J. (eds). Fishes of the Western North Atlantic. Vol. 1. Part 4. Memoir of the Sears Foundation for Marine Research, Yale University, New Haven.

中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Leptostomias robustus Imai, 1941 フデホシエソ

Original description: Imai (1941): 243, figs. 10 & 11.

Imai, S. 1941. Seven new deep-sea fishes obtained in Sagami Sea and Suruga Bay. Japanese Journal of Zoology 9 (2): 233–250.

Holotype (available): ZUMT 55037, Suruga Bay, Shizuoka Pref., Japan; 17 Nov. 1938; collected by C/V Dainichi-Marui at Heda.

Remarks: It was found in fish specimens transferred from Mitsui Marine Biology Research Institute to ZUMT. The original description contains only one specimen. The specimen was found in good agreement with body size and the original figure (figs 10 & 11). This specimen is a holotype and was registered in ZUMT 55037 of the ZUMT collection (ICZN Art. 73.1.1).

三井海洋生物学研究所から ZUMT に移管された魚類標本の中から発見された。原記載には 1 標本のみで記載されている。発見された標本は、体サイズと原記載の図 (figs. 10 & 11) によく一致した。この標本はホロタイプであり、ZUMT コレクションの ZUMT 55037 に登録された(ICZN Art. 73.1.1)。

Current status: Valid as *Leptostomias robustus* Imai, 1941 フデホシエソ

Morrow, J. E., Jr. and Gibbs, R. H., Jr. 1964. Family Melanostomiidae. pp. 351–511. In: Bigelow, H. B., Breder, C. M., Cohen, D. M., Mead, G. W., Merriman, D., Olsen, Y. H., Schroeder, W. C., Schultz, L. P. and Tee-Van, J. (eds). Fishes of the Western North Atlantic. Vol. 1. Part 4. Memoir of the Sears Foundation for Marine Research, Yale University, New Haven.

岡村 収・北島忠弘 (編). 1984. 沖縄舟状海盆及び周辺海域の魚類 I. 日本水産資源保護協会, 東京. 414 pp. [Okamura, O. and Kitajima, T. (eds) 1984. Fishes of the Okinawa Trough and the adjacent water I. Japan Fishery Resources on Conservation Association, Tokyo. 414 pp. (In Japanese and English)]

Okamura, O. and Machida, Y. 1986. Additional records of fishes from Kochi Prefecture, Japan. Memoirs of the Faculty of Science, Kochi University (Series D) (Biology), 7: 17–41.

中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Opostomias mitsuui Imai, 1941 ミツイホシエソ

Original description: Imai (1941): 239, figs. 5–7.

Imai, S. 1941. Seven new deep-sea fishes obtained in Sagami Sea and Suruga Bay. Japanese Journal of Zoology, 9 (2): 233–250.

Holotype (available): ZUMT 55034, off Manazuru, Sagami Bay, Kanagawa Pref., Japan; 18, June 1939; collected with 1.5 m beam trawl with 1500 m wire.

Remarks: This specimen was found in a fish specimen transferred from the Mitsui Marine Biology Research Institute to ZUMT. The original description contains only one specimen. The specimens found were in good agreement with body size and the original figure (figs. 5–7). This specimen is a holotype and was registered in ZUMT 55034 of the ZUMT collection (ICZN Art. 73.1.1).

この標本は三井海洋生物学研究所から ZUMT に移管された魚類標本の中から発見された。原記載には 1 標本のみで記載されている。発見された標本は、体サイズと原記載の図 (figs. 5–7) に良く一致した。この標本がホロタイプであり、ZUMT コレクションの ZUMT 55034 に登録された(ICZN Art. 73.1.1)

Current status: Valid as *Opostomias mitsuui* Imai, 1941 ミツイホシエソ

Morrow, J. E., Jr. and Gibbs, R. H., Jr. 1964. Family Melanostomiidae. pp. 351–511. In: Bigelow,

- H. B., Breder, C. M., Cohen, D. M., Mead, G. W., Merriman, D., Olsen, Y. H., Schroeder, W. C., Schultz, L. P. and Tee-Van, J. (eds). Fishes of the Western North Atlantic. Vol. 1. Part 4. Memoir of the Sears Foundation for Marine Research, Yale University, New Haven.
- 尼岡邦夫・仲谷一宏・新谷久男・安井達夫 (編). 1983. 東北海域・北海道オホーツク海域の魚類. 日本水産資源保護協会, 東京. 327 pp. [Amaoka, K., Nakaya, K., Araya, H. and Yasui, T. (eds). 1983. Fishes from the north-eastern Sea of Japan and the Okhotsk Sea off Hokkaido. Japan Fishery Resources on Conservation Association, Tokyo. 327 pp. (In Japanese and English)]
- Okamura, O. and Machida, Y. 1986. Additional records of fishes from Kochi Prefecture, Japan. *Memoirs of the Faculty of Science, Kochi University (Series D) (Biology)*, 7: 17–41.
- 尼岡邦夫・仲谷一宏・矢部 衛. 2011. 北海道の全魚類図鑑. 北海道新聞社, 札幌. 482 pp. [Amaoka, K., Nakaya, K. and Yabe, M. 1995. Fishes of Hokkaido. The Hokkaido Shimbun Press, Sapporo. 482 pp. (In Japanese)]
- 中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Cypriniformes コイ目

Cyprinidae コイ科

Acheilognathus shimazui Tanaka, 1908 アブラボテ

Original description: Tanaka (1908): 234, fig. 1.

田中茂穂. 1908. 琵琶湖産魚類. *動物学雑誌*, 20 (237): 233–237. [Tanaka, S. 1908. Fish fauna of Lake Biwa. *Zoological Magazine Tokyo*, 20 (237): 233–237. (In Japanese)]

Syntypes (lost): ZUMT 1833 (2), Tokiwa Village, Awata County, Shiga Pref., Japan; Dec. 1906; donated by Kyoto Shimazu Co., Ltd. (滋賀県栗太郡常盤村 [滋賀県草津市]、明治 39 年 12 月採集、京都島津製作所寄贈)

Remarks: This species was published in two papers, Japanese and English, in 1908. The publication date is July 15, 1908 for the Japanese version and December 15, 1908 for the English version (National Diet Library), and the Japanese version is the original description (ICZN Art. 23.1). In the original description of the Japanese version, two samples were used in the description. These two samples of ZUMT 1833 are also used as the type specimens in the description of the English version. Two specimens were registered in ZUMT 1833 in the ZUMT specimen ledger. These are considered as the syntypes. However, these specimens are lost.

この種は、1908 年に和文と英文の 2 つの論文に掲載されている。発行日（国立国会図書館）は和文版が 1908 年 7 月 15 日、英文版では 1908 年 12 月 15 日であり、和文版が原記載となる (ICZN Art. 23.1)。原記載の和文版は記載に 2 標本が使われていた。英文版の記載にもタイプとし ZUMT 1833 の 2 標本を使用している。ZUMT 標本台帳には 2 標本が ZUMT 1833 に登録されていた。これらはシタイプである。ただし、これらの標本は紛失している。

Current status: Synonym of *Tanakia limbata* (Temminck & Schlegel, 1846) アブラボテ

Tanaka, S. 1908. Fish fauna of Lake Biwa, with description of one new species and a list of all the fish species hitherto known from that locality. *Annotationes Zoologicae Japonenses*, 7 (1): 1–15.

中村守純. 1969. 日本のコイ科魚類. 資源科学シリーズ 4, 資源科学研究所, 東京. viii + iv + 455 pp., 149 pls. [Nakamura, M. 1969. Cyprinid fishes of Japan. Contributions from the Special Publication of the Research Institution for Natural Resources, No. 4, Research Institute for Natural Resources, Tokyo. viii + iv + 455 pp., 149 pls. (In Japanese)]

Arai, R. and Y. Akai. 1988. *Acheilognathus melanogaster*, a senior synonym of *A. moriokae*, with a revision of the genera of the subfamily Acheilognathinae (Cypriniformes, Cyprinidae). *Bulletin of the National Science Museum, Zoology (Series A)*, 14 (4): 199–213.

中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Acheilognathus tabira erythropterus Arai, Fujikawa & Nagata, 2007 アカヒレタビラ

Original description: Arai et al. (2007): 11, figs. 3B–D, 8.

Arai, R., Fujikawa, H. and Nagata, Y. 2007. Four new subspecies of *Acheilognathus* Bitterlings (Cyprinidae: Acheilognathidae) from Japan. *Bulletin of the National Museum of Nature and Science (Series A) Supplement*, 1: 1–28.

Paratypes (available): ZUMT 61512 (2), Nasu Town, Nakagawa River system, Tochigi Pref., Japan; 28 May 2005.

Current status: Valid as *Acheilognathus tabira erythropterus* Arai, Fujikawa & Nagata, 2007
アカヒレタビラ

熊谷正裕・萩原富司. 2013. 青森県で確認されたアカヒレタビラ *Acheilognathus tabira erythropterus* とシロヒレタビラ *A. t. tabira*. 伊豆沼・内沼研究報告, 7: 17–22. [Kumagai, M. and Hagiwara, T. 2013. *Acheilognathus tabira erythropterus* and *A. t. tabira* collected from Aomori Prefecture, Japan. Izunuma–Uchinuma Wetland Researches, 7: 17–22. (In Japanese with English abstract)]

中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Acheilognathus tabira jordani Arai, Fujikawa & Nagata, 2007 ミナミアカヒレタビラ

Original description: Arai et al. (2007): 17, figs. 4A–B, 5C–E, 10.

Arai, R., Fujikawa, H. and Nagata, Y. 2007. Four new subspecies of *Acheilognathus* Bitterlings

(Cyprinidae: Acheilognathidae) from Japan. Bulletin of the National Museum of Nature and Science (Series A) Supplement, 1: 1–28.

Paratypes (available): ZUMT 61511 (12), Ohda, Oharagawa River, Shimane Pref., Japan; 4 July 2003.

Current status: Valid as *Acheilognathus tabira erythropterus* Arai, Fujikawa & Nagata, 2007
ミナミアカヒレタビラ
中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、
秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–
III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Acheilognathus tabira tohokuensis Arai, Fujikawa & Nagata, 2007 キタノアカヒレタビラ

Original description: Arai et al. (2007): 13, figs. 3A, 5A, B, 9.

Arai, R., Fujikawa, H. and Nagata, Y. 2007. Four new subspecies of *Acheilognathus* Bitterlings (Cyprinidae: Acheilognathidae) from Japan. Bulletin of the National Museum of Nature and Science (Series A) Supplement, 1: 1–28.

Paratype (available): ZUMT 61513 (1), near Teradomari, Niigata Pref., Japan; 21 Oct. 2005.

Current status: Valid as *Acheilognathus tabira jordani* Arai, Fujikawa and Nagata, 2007 キタノアカヒレタビラ
中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、
秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–
III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Brevigobio kawabatae Tanaka, 1916 カワバタモロコ

Original description: Tanaka (1916): 102.

田中茂穂. 1916. 日本産魚類の二新種. 動物学雑誌, 28 (329): 102–103. [Tanaka, S. 1916. Two new species of Japanese fishes. Zoological Magazine Tokyo, 28 (329): 102–103. (In Japanese)]

Lectotype (available): ZUMT 4339, Lake Biwa, Shiga Pref., Japan; 1914; collected by Jugoro Kawabata. (琵琶湖、滋賀県水産試験場長 川端重五郎採集、大正 3 年)

Paralectotypes (available): ZUMT 59855, ZUMT 59856, ZUMT 59857 (3), same as holotype.

Remarks: There is no holotype designation in the original description. From the ZUMT specimen ledger, there was a specimen ZUMT 4339 that matched the scientific name and collection data. The writing of ZUMT 4339 in the ZUMT specimen ledger says "with type"

and "for illustration", and there are 4 individuals including the type. These specimens are syntypes. The cloth tags tied to the specimens were distinguished from each other by adding a dash to the handwritten registration number 4339. In Tanaka's (1916a) Japanese fish illustration (23: pl. 115, 24: 420–424), ZUMT 4339 is re-described and illustrated as a holotype. The act of designating one of the syntype ZUMT 4339 as the holotype is considered a lectotype designation rather than holotype (ICZN Art. 74.5). The illustrated specimen of Tanaka (1916a) has "type" cloth tag. ZUMT 4339 is the lectotype, and the three other specimens becoming the paralectotypes were registered as ZUMT 59855 to ZUMT 59857 (ICZN Art. 74.5).

In the original description, the collector was "Kingoro Kawabata", in Tanaka (1916b) Figures and descriptions of the fishes of Japan (24: 420–424), "Jugoro Kawabata", and in the ZUMT specimen ledger, "Jugoro Tabata". The name of the director of the Shiga Prefectural Fisheries Experimental Station in 1918 was "Jugoro Kawabata".

原記載にホロタイプの指定がない。ZUMT 標本台帳から学名と収集データに一致した標本 ZUMT 4339 があった。ZUMT 標本台帳の ZUMT 4339 の書き込みには「type あり」と「図説用」とあり、タイプを含む 4 個体がある。これらの標本はシタイプである。標本に結ばれた布タグには、手書きの登録番号 4339 にダッシュを加筆し互いに区別されていた。田中(1916a)の日本産魚類図説(23: pl. 115, 24: 420–424)では ZUMT 4339 をホロタイプとして再記載し、図示している。シタイプの ZUMT 4339 の中の 1 個体をホロタイプに指定した行為は、ホロタイプではなくレクトタイプの指定と見なされる(ICZN Art. 74.5)。シタイプの ZUMT 4339 の中の 1 個体をホロタイプに指定した行為は、ホロタイプではなくレクトタイプの指定と見なされる(ICZN Art. 74.5)。田中(1916b)の図示標本は、「type」の布タグが付いている。ZUMT 4339 はレクトタイプであり、他の 3 標本のパラレクトタイプは、ZUMT 59855–ZUMT 59857 に登録された(ICZN Art. 74.1.3)。

原記載では採集者は「川端金五郎」、田中 (1916b) の 日本産魚類図説(24: 420–424)では「川端重五郎」、ZUMT 標本台帳の記述は「田端重五郎」とあった。大正 3 年の滋賀県水産試験場の場長名は、「川端重五郎」であった。

- Current status: Synonym of *Hemigrammocypripis neglecta* (Stieler, 1907) カワバタモロコ
- 田中茂穂. 1916a. 日本産魚類図説, 23: 399–418, pls. 111–115. [Tanaka, S. 1916a. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 23: 399–418, pls. 111–115. (In Japanese and English)]
- 田中茂穂. 1916b. 日本産魚類図説, 24: 419–440, pls. 116–120. [Tanaka, S. 1916b. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 24: 419–440, pls. 116–120. (In Japanese and English)]
- Jordan, D. S. and Hubbs, C. L. 1925. Record of fishes obtained by David Starr Jordan in Japan, 1922. *Memoirs of the Carnegie Museum*, 10 (2): 93–346, pls. 5–12.
- 中村守純. 1969. 日本のコイ科魚類. 資源科学シリーズ 4, 資源科学研究所, 東京. viii + iv + 455 pp., 149 pls. [Nakamura, M. 1969. Cyprinid fishes of Japan. Contributions from the Special Publication of the Research Institution for Natural Resources, No. 4. Research Institute for Natural Resources, Tokyo. viii + iv + 455 pp., 149 pls. (In Japanese)]

- Zarske, A. 2013. *Barilius neglectus* Stielers, 1907 -- ein senior synonym von *Hemigrammocypripis rasborella* Fowler, 1910 (Teleostei: Cypriniformes: Cyprinidae). *Vertebrate Zoology*, 63 (3): 253–257.
- 中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. *Fishes of Japan with pictorial keys to the species I–III*, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]
- Ito, T., Hoshino, K. and Hosoya, K. 2021. Osteology of *Hemigrammocypripis neglecta* (Teleostei: Cypriniformes) with comments on its systematic position. *Zootaxa*, 4995 (1): 147–160.

***Erythroculter macrophthalmus* Berg, 1934**

Original description: Berg (1934): 265, 266.

Berg, L. S. 1934. Notes on *Culter recurviceps* (Rich.) (Cyprinidae). *Doklady Akademii Nauk SSSR*, 2 (4): 264–266. [In Russian and English]

Holotype (available): ZUMT 18120, Taihoku (Taipei), Taiwan.

Remark: The original description was based on the *Culter recurviceps* (42: 813–816, pl. 173, fig. 477) published by Tanaka (1928) in the Figures and descriptions of the fishes of Japan. The illustrated specimen ZUMT 18120 is treated as designated and is a holotype (ICZN Art. 73.1.4).

原記載では、田中 (1928)が日本産魚類図説に掲載した *Culter recurviceps* (42: 813–816, pl. 173, fig. 477) に基づいて記載された。図示された標本 ZUMT 18120 を指定したと扱い、ホロタイプである(ICZN Art. 73.1.4)。

Current status: Synonym of *Sinibrama macrops* (Günther, 1868)

田中茂穂. 1928. 日本産魚類図説. 42: 809–830, pls. 172–174. [Tanaka, S. 1928. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 42: 809–830, pls. 172–174. (In Japanese and English)]

Ho, H.-C. and Shao, K.-T. 2011. Annotated checklist and type catalog of fish genera and species described from Taiwan. *Zootaxa*, 2957: 1–74.

Takeuchi, H. and Hosoya, K. 2011. Osteology of *Ischikauia steenackeri* (Teleostei: Cypriniformes) with comments on its systematic position. *Ichthyological Research*, 58 (1): 10–18.

Kottelat, M. 2013. The fishes of the inland waters of Southeast Asia: a catalogue and core bibliography of the fishes known to occur in freshwaters, mangroves and estuaries. *Raffles Bulletin of Zoology Supplement*, 27: 1–663.

Rhodeus albomarginatus Li & Arai, 2014

Original description: Li and Arai (2014): 167, figs. 1–8.

Li, F. and R. Arai. 2014. *Rhodeus albomarginatus*, a new bitterling (Teleostei: Cyprinidae: Acheilognathinae) from China. *Zootaxa*, 3790 (1): 165–176.

Paratypes (available): ZUMT 61048 (1, male; 45.8 mm SL), ZUMT 61049 (1, female; 38.8 mm SL), Lijiang River, Yangtze River system, Xuling Town, Qimen County, Anhui Province, China; 5 Oct. 2011.

Current status: Valid as *Rhodeus albomarginatus* Li & Arai, 2014

Li, F., Liao, T.-Y., Arai, R. and Zhao, L.-J. 2017. *Sinorhodeus microlepis*, a new genus and species of bitterling from China (Teleostei: Cyprinidae: Acheilognathinae). *Zootaxa*, 4353 (1): 69–88.

Li, F., Liao, T.-Y., and Arai, R. 2020. Two new species of *Rhodeus* (Teleostei: Cyprinidae: Acheilognathinae) from the River Yangtze, China. *Journal of Vertebrate Biology*, 69 (1): 1–17.

Rhodeus miobuta Tanaka, 1909

Original description: Tanaka (1909): 12.

Tanaka, S. 1909. Descriptions of one new genus and ten new species of Japanese fishes. *Journal of the College of Science. Imperial University, Tokyo*, 27 (8): 1–27, pl. 1.

Holotype (available): ZUMT 1860, Kohama, Ohara, Chiba Pref., Japan; 19, Feb. 1908; donated by T. Suzuki.

Paratype (available): ZUMT 2006 (1), same locality as holotype; dated Aug. 1908.

Paratypes (lost): ZUMT 2157 (2), same locality as holotype; dated 29 Feb. 1908.

Remarks: In the original description, ZUMT 1860 was designated as a holotype, and 3 other specimens were used. From the records in the ZUMT specimen ledger, ZUMT 2006 (1) and ZUMT 2157 (2) were specimens that matched the scientific name and collection data. These are paratypes.

原記載は ZUMT 1860 をホロタイプに指定し、他に 3 標本を使用した。ZUMT 標本台帳の記録から学名と収集データに一致する標本 ZUMT 2006(1)と ZUMT 2157(2)があった。これらはパラタイプである。

Current status: Valid as *Pseudorhodeus tanago* (Tanaka, 1909) ミヤコタナゴ

田中茂穂. 1911. 日本産魚類図説. 1: 1–18, pls. 1–5. [Tanaka, S. 1911. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 1: 1–18, pls. 1–5. (In Japanese and English)]

- 中村守純. 1969. 日本のコイ科魚類. 資源科学シリーズ 4, 資源科学研究所, 東京. viii + iv + 455 pp., 149 pls. [Nakamura, M. 1969. Cyprinid fishes of Japan. Contributions from the Special Publication of the Research Institution for Natural Resources, No. 4, Research Institute for Natural Resources, Tokyo. viii + iv + 455 pp., 149 pls. (In Japanese)]
- Arai, R. and Akai, Y. 1988. *Acheilognathus melanogaster*, a senior synonym of *A. moriokae*, with a revision of the genera of the subfamily Acheilognathinae (Cypriniformes, Cyprinidae). *Bulletin of the National Science Museum, Series A (Zoology)*, 14 (4): 199–213.
- 中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. *Fishes of Japan with pictorial keys to the species I–III*, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]
- Chang, C.-H., Li, F., Shao, K.-T., Lin, Y.-S., Morosawa, T., Kim, S., Koo, H., Kim, W., Lee, J.-S., He, S., Smith, C., Reichard, M., Miya, M., Sado, T., Uehara, K., Lavoué, S., Chen, W.-J. and Mayden, R. 2014. Phylogenetic relationships of Acheilognathidae (Cypriniformes: Cyprinoidea) as revealed from evidence of both nuclear and mitochondrial gene sequence variation: evidence for necessary taxonomic revision in the family and the identification of cryptic species. *Molecular Phylogenetics and Evolution*, 81: 182–194.

Rhodeus pseudosericeus Arai, Jeon & Ueda, 2001 ニセヨーロッパタナゴ

Original description: Arai, Jeon and Ueda (2001): 276, figs. 1–6.

Arai, R., Jeon, S.-R. and Ueda, T. 2001. *Rhodeus pseudosericeus* sp. nov., a new bitterling from South Korea (Cyprinidae: Acheilognathinae). *Ichthyological Research*, 48 (3): 275–282.

Paratypes (available): ZUMT 61146 (4), Huk River, Namhan River system, Gongse-ri, Gaegun-myon, Yangpyong-gun, Gyonggi-do, South Korea; 5 Dec. 1998.

Paratypes (available): ZUMT 61147 (3), Jon River, Namhan River system, Jogok-ri, Hoengsong-up, Hoengsong-gun, Gangwon-do, South Korea; 22 Oct. 1989.

Paratypes (available): ZUMT 61148 (2), Iri River, tributary of Som River, Namhan River system, Okgye-ri, Sowon-myon, Hoengsong-gun, Gangwon-do, South Korea; 16 Oct. 1999.

Paratypes (available): ZUMT 61149, ZUMT 61150, ZUMT 61151 (3), Gungye River, tributary of Som River, Namhan River system, Hakdam-ri, Gongun-myon, Hoengsong-gun, Gangwon-do, South Korea; 16 Oct. 1999.

Current status: Valid as *Rhodeus pseudosericeus* Arai, Jeon & Ueda, 2001 ニセヨーロッパタナゴ

Li, F. and Arai, R. 2014. *Rhodeus albomarginatus*, a new bitterling (Teleostei: Cyprinidae: Acheilognathinae) from China. *Zootaxa*, 3790 (1): 165–176.

Li, F., Arai, R. and Liao, T.-Y. 2020. *Rhodeus flaviventris*, a new bitterling (Teleostei: Cyprinidae: Acheilognathinae) from China. *Zootaxa*, 4790 (2): 329–340.

Rhodeus shitaiensis Li & Arai, 2011

Original description: Li and Arai (2011): 305, figs 1–5, 6a–b, 7.

Li, F. and Arai, R. 2011. *Rhodeus shitaiensis*, a new bitterling from China (Teleostei: Cyprinidae). Ichthyological Exploration of Freshwaters 21 (4): 303–312.

Paratypes (available): ZUMT 61947 (4, male), Qiupu Rive Changjiang River system, Shitai County, Anhui Province, China (30°11'N, 117°30' E); 3 May 2009; collected by F. Li.

Current status: Valid as *Rhodeus shitaiensis* Li & Arai, 2011

Li, F., Arai, R. and Liao, T.-Y. 2020. *Rhodeus flaviventris*, a new bitterling (Teleostei: Cyprinidae: Acheilognathinae) from China. Zootaxa, 4790 (2): 329–340.

Li, F., Liao, T.-Y. and Arai, R. 2020. Two new species of *Rhodeus* (Teleostei: Cyprinidae: Acheilognathinae) from the River Yangtze, China. Journal of Vertebrate Biology, 69 (1): 1–17.

Rhodeus tanago Tanaka, 1909

Original description: Tanaka (1909): 10.

Tanaka, S. 1909. Descriptions of one new genus and ten new species of Japanese fishes. Journal of the College of Science. Imperial University, Tokyo, 27 (8): 1–27, pl. 1.

Holotype (lost): ZUMT 1710, a pond in the Botanical Garden at Tokyo (Koishikawa Botanical Garden), Japan. (植物園 [小石川植物園、東京. 都文京区白山])

Paratype (available): ZUMT 2156 (1), same as holotype.

Remarks: In the original description, ZUMT 1710 was designated as the holotype, and one paratype was used. There was a specimen ZUMT 2156 whose holotype and collected data matched from the records in the ZUMT sample ledger. This specimen is the paratype and has two labels, "2156" and "Tokyo Imperial Botanical Garden (Koishikawa Botanical Garden)". The holotype ZUMT 1710 is lost.

原記載は、ZUMT 1710 をホロタイプに指定し、その他にパラタイプ 1 標本を使用した。ZUMT 標本台帳の記録からホロタイプと収集データが一致した標本 ZUMT 2156 があった。この標本は、パラタイプで「2156」と「東京. 帝国植物園 (小石川植物園)」の 2 つのラベルが付いている。ホロタイプ ZUMT 1710 は紛失している。

Current status: Valid as *Pseudorhodeus tanago* (Tanaka, 1909) ミヤコタナゴ

中村守純. 1969. 日本のコイ科魚類. 資源科学シリーズ 4, 資源科学研究所, 東京. viii + iv + 455 pp., 149pls. [Nakamura, M. 1969. Cyprinid fishes of Japan. Contributions from the Special Publication of the Research Institution for Natural Resources, No. 4, Research Institute for Natural Resources, Tokyo. viii + iv + 455 pp., 149 pls. (In Japanese)]

Chang, C.-H., Lin, W.-W., Shao, Y.-T., Arai, R., Ishinabe, T., Ueda, T., Matsuda, M., Kubota, H., Wang, F.-Y., Jang-Liaw, N.-H. and Kao, H.-W. 2009. Molecular phylogeny and genetic differentiation of the *Tanakia himantegus* complex (Teleostei: Cyprinidae) in Taiwan and China. *Zoological Studies*, 48 (6): 823–834.

中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. *Fishes of Japan with pictorial keys to the species I–III*, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Chang, C.-H., Li, F., Shao, K.-T., Lin, Y.-S., Morosawa, T., Kim, S., Koo, H., Kim, W., Lee, J.-S., He, S., Smith, C., Reichard, M., Miya, M., Sado, T., Uehara, K., Lavoué, S., Chen, W.-J. and Mayden, R. 2014. Phylogenetic relationships of Acheilognathidae (Cypriniformes: Cyprinoidea) as revealed from evidence of both nuclear and mitochondrial gene sequence variation: evidence for necessary taxonomic revision in the family and the identification of cryptic species. *Molecular Phylogenetics and Evolution*, 81: 182–194.

Aulopiformes ヒメ目

Aulopidae ヒメ科

Aulopus damasi Tanaka, 1915 エソダマシ

Original description: Tanaka (1915): 340, pl. 92 (fig. 295).

田中茂穂. 1915. 日本産魚類図説. 19: 319–342, pls. 91–95. [Tanaka, S. 1915. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 19: 319–342, pls. 91–95. (In Japanese and English)]

Holotype (lost): ZUMT 3771, off Prov. Izu (obtained at Tokyo Market) Japan.

Remarks: There is no holotype designation in the original description. ZUMT 3771 is a holotype because it is described only in the illustrated specimen ZUMT 3771 (ICZN Art. 73.1.2). This specimen is lost. Gomon et al. (2013) designated NSMT-P 115220 (National Museum of Nature and Science, Zoology Department, Division of Fishes, Tsukuba, Japan) as the neotype.

原記載にはホロタイプの指定はない。図示された標本 ZUMT 3771 のみで記載されているため、ZUMT 3771 はホロタイプである (ICZN Art. 73.1.2)。この標本は紛失している。Gomon et al. (2013) はネオタイプに NSMT-P 115220 (National Museum of Nature and Science, Zoology Department, Division of Fishes, Tsukuba, Japan) を指定した。

Current status: Valid as *Leptaulopus damasi* (Tanaka, 1915) エソダマシ

岡村 収・北島忠弘 (編). 1984. 沖縄舟状海盆及び周辺海域の魚類 I. 日本水産資源保護協会, 東京. 414 pp. [Okamura, O. and Kitajima, T. (eds). 1984. *Fishes of the Okinawa Trough and the adjacent water I*. Japan Fishery Resources on Conservation Association, Tokyo. 414 pp. (In Japanese and English)]

- 山田梅芳・田川 勝・岸田周三・本城康至. 1986. 東シナ海・黄海のさかな. 西海区水産研究所, 長崎. xxvi + 502 pp. [Yamada, U., Tagawa, M., Kishida, S., and Honjo, K. 1986. Fishes of the East China Sea and the Yellow Sea. Seikai Regional Fisheries Research Laboratory, Nagasaki. xxvi + 502 pp. (In Japanese)]
- 畑 晴陵・伊東正英・本村浩之. 2012. 鹿児島県から得られたヒメ科エソダマシ *Aulopus damasi* の記録. *Nature of Kagoshima* 38: 9–11. [Hata, H., Itou, M. and Motomura, H. 2012. First record of *Aulopus damasi* (Aulopiformes: Aulopidae) from Kagoshima Prefecture, southern Japan. *Nature of Kagoshima* 38: 9–11. (In Japanese)]
- 中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]
- Gomon, M. F., Struthers, C. D. and Stewart, A. L. 2013. A new genus and two new species of the family Aulopidae (Aulopiformes), commonly referred to as *Aulopus*, *flagfins*, Sergeant Bakers or *Threadsails*, in Australasian waters. *Species Diversity*, 18: 141–161.
- 赤池貴大・前川隆則・本村浩之. 2021. 標本に基づく魚類 6 種の奄美大島からの初めての記録. *Ichthy, Natural History of Fishes of Japan*, 6: 41–47. [Aikake, T., Maekawa, T. and Motomura, H. 2021. First specimen-based records of six fish species from Amami-oshima island, Ryukyu Islands, Japan. *Ichthy, Natural History of Fishes of Japan*, 6: 41–47. (In Japanese with English abstract)]

Synodontidae エソ科

Saurida isarankurai Shindo & Yamada, 1972

Original description: Shindo and Yamada (1972): 6, fig. 7.

Shindo, S. and Yamada, U. 1972. Descriptions of three new species of the lizardfish genus *Saurida*, with a key to its Indo–Pacific species. *UO (Japanese Society of Ichthyologists)*, 11: 1–13, 12: 1–14.

Holotype (available): ZUMT 52501, Prachambkirikan Province, Gulf of Thailand, Thailand.

Paratypes (available): ZUMT 54347 (1), ZUMT 54348 (1), same as holotype.

Remarks: The original specimen abbreviation ZIUT (Zoological Institute, Faculty of Science, University of Tokyo) is the same as ZUMT (Department of Zoology, the University Museum, the University of Tokyo). The species was described based on the holotype and 48 paratypes. Holotype ZUMT 52501 and two paratypes, ZUMT 54 347 and ZUMT 54 348, are registered in the ZUMT collection, although not mentioned in the original description. Paratypes other than ZUMT are not described in the original description, so the storage location is unknown.

原記載の標本略号 ZIUT (Zoological Institute, Faculty of Science, University of Tokyo) は、ZUMT (Department of Zoology, the University Museum, the University of Tokyo) と同じである。この種は、ホロタイプと 48 個体のパラタイプに基づいて記載された。ZUMT コレクションにホロタイプ ZUMT 52501 と原記載に記述はないがパラタイプ 2 標本、ZUMT 54347 と ZUMT 54348 が登録されている。ZUMT 以外のパラタイプは、原記載に記述がないため、保管場所は不明。

Current status: Valid as *Saurida isarankurai* Shindo & Yamada, 1972

Waples, R. S. 1982 [1981]. A biochemical and morphological review of the lizardfish genus *Saurida* in Hawaii, with the description of a new species. *Pacific Science*, 35 (3): 217–235.

Motomura, H., Alama, U. B., Muto, N., Babaran, R. P. and Ishikawa, S. (eds). 2017. Commercial and bycatch market fishes of Panay Island, Republic of the Philippines. The Kagoshima University Museum, Kagoshima, University of the Philippines Visayas, Iloilo, and Research Institute for Humanity and Nature, Kyoto, Japan. 246 pp.

Saurida macrolepis Tanaka, 1917 マエソダマシ

Original description: Tanaka (1917): 39.

田中茂穂. 1917. 日本産魚類の六新種. *動物学雑誌*, 29 (340): 37–40. [Tanaka, S. 1917. Six new species of Japanese fishes. *Zoological Magazine Tokyo*, 29 (340): 37–40. (In Japanese)]

Syntype (lost): ZUMT 7477 (1), Tokyo Market, Japan.

Syntypes (available): ZUMT 7478 (1), ZUMT 7479 (1), Tokyo Market, Japan.

Remarks: There is no holotype designation in the original description. In the records of the ZUMT specimen ledger, the scientific names and collected data matched the three specimens of ZUMT 7477 to 7479. These specimens are thin type (ICZN Art. 73.2.). Writing "7477 type" in the ZUMT specimen ledger is not evidence of the holotype fixation. It is not considered to be a fixed holotype by the original designation (ICZN Art. 72.4.7, 73.1.1).

Inoue and Nakabo (2006) regarded ZUMT 7477 as a holotype and ZUMT 7478 and ZUMT 7479 as paratypes. Since the ZUMT 7477 is missing, the paratype ZUMT 7478 has been designated as the neotype of this species. They made the ZUMT 7477 a holotype, but the specimen is one of the syntypes. After specifying the neotype, this neotype will be discarded when the syntypes of this species, ZUMT 7478 and ZUMT 7479, are present. These specimens are revived as the name-bearing type (ICZN Art. 75.8).

原記載にはホロタイプの指定がない。ZUMT 標本台帳の記録では学名や収集データに ZUMT 7477–7479 の 3 標本が一致した。これらの標本はシタイプである (ICZN Art. 73.2)。ZUMT 標本台帳にある「7477 type」の書き込みは、ホロタイプを固定した証拠にはならない。原指定によるホロタイプの固定とは見なされない (ICZN Art. 72.4.7, 73.1.1)。

Inoue and Nakabo (2006)は、ZUMT 7477 をホロタイプに、ZUMT 7478 と ZUMT 7479 をパラタイプと見なした。ZUMT 7477 が紛失しているため、パラタイプ ZUMT 7478 を本種のネオタイプに指定した。彼らが ZUMT 7477 をホロタイプとしたが、その標本はシタイプの 1 つである。ネオタイプを指定した後で、本種のシタイプである ZUMT 7478 と ZUMT 7479 が存在する時点で、このネオタイプは破棄される。その標本が担名タイプとして復活する (ICZN Art. 75.8)。

Current status: Valid as *Saurida macrolepis* Tanaka, 1917 マエソ

Inoue, T. and Nakabo, T. 2006. The *Saurida undosquamis* group (Aulopiformes: Synodontidae), with description of a new species from southern Japan. Ichthyological Research, 53 (4): 379–397.

Russell, B. C., Golani, D. and Tikochinski, Y. 2015. *Saurida lessepsianus* a new species of lizardfish (Pisces: Synodontidae) from the Red Sea and Mediterranean Sea, with a key to *Saurida* species in the Red Sea. Zootaxa, 3956 (4): 559–568.

Yeo, M. and Kim, J.-K. 2018. Taxonomic review of the genus *Saurida* (Aulopiformes: Synodontidae) from Korea. Korean Journal of Ichthyology, 30 (4): 205–216. [In Korean with English abstract]

Saurida micropectoralis Shindo & Yamada, 1972

Original description: Shindo and Yamada (1972): 11–12: fig. 9.

Shindo, S. and Yamada, U. 1972. Descriptions of three new species of the lizardfish genus *Saurida*, with a key to its Indo–Pacific species. UO (Japanese Society of Ichthyologists), 11: 1–13, 12: 1–14.

Holotype (available): ZUMT 52503, Prachambkirikan Province, Gulf of Thailand, Thailand.

Paratype (available): ZUMT 54349 (1), same as holotype.

Remarks: The original specimen abbreviation ZIUT (Zoological Institute, Faculty of Science, University of Tokyo) is the same as ZUMT (Department of Zoology, the University Museum, the University of Tokyo).

The species was described based on the holotypes and 32 paratypes. The holotype ZUMT 52503 and paratype ZUMT 54349 are registered in the ZUMT collection. Since there is no description in the original description, the storage location of paratypes other than ZUMT is unknown.

原記載の標本略号 ZIUT (Zoological Institute, Faculty of Science, University of Tokyo) は、ZUMT (Department of Zoology, the University Museum, the University of Tokyo) と同じである。

この種は、ホロタイプと 32 個体のパラタイプに基づいて記載された。ZUMT コレクションにホロタイプ ZUMT 52503 と原記載に記述はないがパラタイプ ZUMT 54349 が登録されている。ZUMT 以外のパラタイプは、原記載に記述がないため、保管場所は不明。

Current status: Valid as *Saurida micropectoralis* Shindo & Yamada, 1972 コソデエソ

Habib, K. A. and Islam, M. J. 2020. An updated checklist of marine fishes of Bangladesh. Bangladesh Journal of Fisheries, 32 (2): 357–367.

Krishnan, S. and Mishra, S. S. 1994. On a collection of fish from middle and south Andaman Group of islands. Records of the Zoological Survey of India, 94 (2–4): 265–306.

- Miyahara, H., Choi, Y., Yabe, M. and Nakaya, K. 2002. First record of a synodontid fish, *Saurida micropectoralis* from Japan. Japanese Journal of Ichthyology, 49 (2): 127–131.
- Psomadakis, P., Thein, H., Russell, B. C. and Tun, M. T. 2020. Field identification guide to the living marine resources of Myanmar. FAO species identification guide for fishery purposes. Food and Agriculture Organization of the United Nations, and Department of Fisheries, Ministry of Agriculture, Livestock and Irrigation, Republic of the Union of Myanmar, Rome. xvii + 694 pp, pls. 1–58.

Saurida wanieso Shindo & Yamada, 1972

Original description: Shindo and Yamada (1972): 8, 12, fig. 8.

Shindo, S. and Yamada, U. 1972. Descriptions of three new species of the lizardfish genus *Saurida*, with a key to its Indo–Pacific species. UO (Japanese Society of Ichthyologists), 11: 1–13. 12: 1–14.

Holotype (available): ZUMT 52502, East China Sea.

Remarks: The original specimen abbreviation ZIUT (Zoological Institute, Faculty of Science, University of Tokyo) is the same as ZUMT (Department of Zoology, the University Museum, the University of Tokyo). The species was described based on the holotypes and 103 paratypes. The holotype ZUMT 52502 is registered in the ZUMT collection. Since there is no description in the original description, the storage location of paratypes other than ZUMT is unknown.

原記載の標本略号 ZIUT (Zoological Institute, Faculty of Science, University of Tokyo) は、ZUMT (Department of Zoology, the University Museum, the University of Tokyo) と同じである。この種は、ホロタイプと 103 個体のパラタイプに基づいて記載された。ホロタイプ ZUMT 52502 は、ZUMT コレクションに登録されている。原記載に記述がないため、ZUMT 以外のパラタイプの保管場所は不明。

Current status: Valid as *Saurida wanieso* Shindo & Yamada, 1972 ワニエソ

岡村 収・北島忠弘 (編). 1984. 沖縄舟状海盆及び周辺海域の魚類 I. 日本水産資源保護協会, 東京. 414 pp. [Okamura, O. and Kitajima, T. (eds). 1984. Fishes of the Okinawa Trough and the adjacent water I. Japan Fishery Resources on Conservation Association, Tokyo. 414 pp. (In Japanese and English)]

山田梅芳・田川 勝・岸田周三・本城康至. 1986. 東シナ海・黄海のさかな. 西海区水産研究所, 長崎. xxvi + 502 pp. [Yamada, U., Tagawa, M., Kishida, S., and Honjo, K. 1986. Fishes of the East China Sea and the Yellow Sea. Seikai Regional Fisheries Research Laboratory, Nagasaki. xxvi + 502 pp. (In Japanese)]

Yamaoka, K., Nishiyama, M. and Taniguchi, N. 1989. Genetic divergence in lizardfishes of the genus *Saurida* from southern Japan. Japanese Journal of Ichthyology, 36 (2): 208–219.

清水孝昭. 2001. 愛媛県伊予市沿岸域の魚類目録. 徳島県立博物館研究報告, 11: 17–99. [Shimizu, T. 2001. An annotated list of the coastal fishes from Iyo City, Ehime Pref., Japan. Bulletin of the Tokushima Prefectural Museum, 11: 17–99. (In Japanese with English abstract)]

- 中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I-III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I-III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]
- Yeo, M. and Kim, J.-K. 2018. Taxonomic review of the genus *Saurida* (Aulopiformes: Synodontidae) from Korea. Korean Journal of Ichthyology, 30 (4): 205–216. [In Korean with English abstract]
- 園山貴之・荻本啓介・堀 成夫・内田喜隆・河野光久. 2020. 証拠標本および画像に基づく山口県日本海産魚類目録. 鹿児島大学総合研究博物館研究報告, 11: 1–152. [Sonoyama, T., Ogimoto, K., Hori, S., Uchida, Y. and Kawano, M. 2020. An annotated checklist of marine fishes of the Sea of Japan off Yamaguchi Prefecture, Japan, with 74 new records. Bulletin of the Kagoshima University Museum, 11: 1–152. (In Japanese with English abstract)]

Synodus fuscus Tanaka, 1917 スナエソ

Original description: Tanaka (1917): 38.

- 田中茂穂. 1917. 日本産魚類の六新種. 動物学雑誌, 29 (340): 37–40. [Tanaka, S. 1917. Six new species of Japanese fishes. Zoological Magazine Tokyo, 29 (340): 37–40. (In Japanese)]

Holotype (lost): ZUMT 7472, Tokyo Market, Japan.

Remarks: There is no holotype designation in the original description. From the records in the ZUMT specimen ledger, only ZUMT 7472 matched the scientific name and the collection data. The ZUMT 7472 is holotype. The specimen has not been located at this time, and was judged to have been lost.

原記載にはホロタイプの指定がない。ZUMT 標本台帳の記録か、ZUMT 7472 のみが学名と収集データともに一致した。ZUMT 7472 はホロタイプである。現時点での標本は確認できないため、失われたと判断した。

Current status: Valid as *Synodus fuscus* Tanaka, 1917 スナエソ

- Chen, J.-P., Ho, H.-C., and Shao, K.-T. 2007. A new lizardfish (Aulopiformes: Synodontidae) from Taiwan with descriptions of three new records. Zoological Studies, 46 (2): 148–154.
- Cressey, R. F. 1981. Revision of Indo-West Pacific lizardfishes of the genus *Synodus* (Pisces: Synodontidae). Smithsonian Contributions to Zoology, 342: iii + 1–53.
- 益田 一・尼岡邦夫・荒賀忠一・上野輝彌・吉野哲夫 (編). 1984. 日本産魚類大図鑑. 東海大学出版会, 東京. xx + 448 pp., 370 pls. [Masuda, H., Amaoka, K., Araga, C., Ueno, T. and Yoshino, T. (eds). 1984. The Fishes of the Japanese Archipelago. Tokai University Press, Tokyo. xx + 448 pp., 370 pls.]
- 中坊徹次・町田吉彦・山岡耕作・西田清徳 (編). 2001. 以布利黒潮の魚, ジンベエザメからマンボウまで. 大阪海遊館, 大阪. 300 pp. [Nakabo, T., Machida, Y., Yamaoka, K. and Nishida, K. (eds). 2001. Fishes of the Kuroshio Current, Japan. Osaka Aquarium Kaiyukan, Osaka. 300 pp. (In Japanese and English)]

中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I-III. 第三版. 東海大学出版会、
秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I-
III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Synodus hoshinonis Tanaka, 1917 ホシノエソ

Original description: Tanaka (1917): 38.

田中茂穂. 1917. 日本産魚類の六新種. 動物学雑誌. 29 (340): 37-40. [Tanaka, S. 1917.
Six new species of Japanese fishes. Zoological Magazine Tokyo, 29 (340): 37-40. (In
Japanese)]

Holotype (available): ZUMT 7476, Hiro, Hirokawa, Arita Dist., Wakayama Pref., Japan;
collected by Isaburo Hoshino. (紀伊國廣 [和歌山県有田郡広川町広] 星野伊三郎採集)

Remarks: There is no holotype designation in the original description. ZUMT 7476 is the only
specimen that matches the scientific name and collection data from the records in the ZUMT
specimen ledger. ZUMT 7476 is a holotype (ICZN Art. 72.4.1.1, 73.1.5).

原記載にはホロタイプの指定がない。ZUMT 7476 は、ZUMT 標本台帳の記録から
学名と収集データが一致した唯一標本である。ZUMT 7476 はホロタイプである (ICZN
Art. 72.4.1.1, 73.1.5)。

Current status: Valid as *Synodus hoshinonis* Tanaka, 1917 ホシノエソ

Cressey, R. F. 1981. Revision of Indo-West Pacific lizardfishes of the genus *Synodus* (Pisces:
Synodontidae). Smithsonian Contributions to Zoology, 342: iii + 1-53.

益田 一・尼岡邦夫・荒賀忠一・上野輝彌・吉野哲夫 (編). 1984. 日本産魚類大図
鑑. 東海大学出版会, 東京. xx + 448 pp., 370 pls. [Masuda, H., Amaoka, K. Araga, C.,
Ueno, T. and Yoshino, T. (eds). 1984. The Fishes of the Japanese Archipelago. Tokai
University Press, Tokyo. xx + 448 pp., 370 pls.]

中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I-III. 第三版. 東海大学出版会、
秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I-
III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Motomura, H., Alama, U. B., Muto, N., Babaran, R. P. and Ishikawa, S. (eds.). 2017.
Commercial and bycatch market fishes of Panay Island, Republic of the Philippines. The
Kagoshima University Museum, Kagoshima, University of the Philippines Visayas, Iloilo,
and Research Institute for Humanity and Nature, Kyoto, Japan. 246 pp.

Synodus macrops Tanaka, 1917 チョオチヨオエソ

Original description: Tanaka (1917): 38.

田中茂穂. 1917. 日本産魚類の六新種. 動物学雑誌, 29 (340): 37-40. [Tanaka, S. 1917.
Six new species of Japanese fishes. Zoological Magazine Tokyo, 29 (340): 37-40. (In
Japanese)]

Syntypes (available): ZUMT 7473, ZUMT 7474, ZUMT 7475, Tokyo Market, Japan.

Remarks: There is no holotype designation in the original description. From the records in the ZUMT specimen ledger, 3 specimens, ZUMT 7473, ZUMT 7474, and ZUMT 7475, matched the scientific name and collection site. In addition, there was a note of "7473 type". The writing of "7473 type" in the ZUMT specimen ledger is not always evidence fixed to the holotype. Not a holotype fixed by the original designation (ICZN Art. 72.4.7, 73.1.1). These specimens are syntypes (ICZN Art. 73.2).

原記載にはホロタイプの指定がない。ZUMT 標本台帳の記録では 3 標本 ZUMT 7473–7475 が学名や採集地に一致した。さらに「7473 type」の書き込みがあった。ZUMT 標本台帳にある「7473 type」の書き込みは、ホロタイプに固定された証拠であるとは限らない。原指定による固定されたホロタイプでない (ICZN Art. 72.4.7, 73.1.1)。これらの標本はシントタイプである (ICZN Art. 73.2)。

Current status: Valid as *Synodus macrops* Tanaka, 1917 チョオチョオエソ

Cressey, R. F. 1981. Revision of Indo-West Pacific lizardfishes of the genus *Synodus* (Pisces: Synodontidae). *Smithsonian Contributions to Zoology*, 342: iii + 1–53.

Ho, H.-C., Chen, J.-P., and Shao, K.-T. 2016. A new species of the lizardfish genus *Synodus* (Aulopiformes: Synodontidae) from the western Pacific Ocean. *Zootaxa*, 4162 (1): 134–142.

益田 一・尼岡邦夫・荒賀忠一・上野輝彌・吉野哲夫 (編). 1984. 日本産魚類大図鑑. 東海大学出版会, 東京. xx + 448 pp., 370 pls. [Masuda, H., Amaoka, K. Araga, C., Ueno, T. and Yoshino, T. (eds). 1984. *The Fishes of the Japanese Archipelago*. Tokai University Press, Tokyo. xx + 448 pp., 370 pls.]

岡村 収・北島忠弘 (編). 1984. 沖縄舟状海盆及び周辺海域の魚類 I. 日本水産資源保護協会, 東京. 414 pp. [Okamura, O. and Kitajima, T. (eds). 1984. *Fishes of the Okinawa Trough and the adjacent water I*. Japan Fishery Resources on Conservation Association, Tokyo. 414 pp. (In Japanese and English)]

山田梅芳・田川 勝・岸田周三・本城康至. 1986. 東シナ海・黄海のさかな. 西海区水産研究所, 長崎. xxvi + 502 pp. [Yamada, U., Tagawa, M., Kishida, S., and Honjo, K. 1986. *Fishes of the East China Sea and the Yellow Sea*. Seikai Regional Fisheries Research Laboratory, Nagasaki. xxvi + 502 pp. (In Japanese)]

中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会, 秦野. 2530 pp. [Nakabo, T. (ed). 2013. *Fishes of Japan with pictorial keys to the species I–III, third edition*. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

藤原恭司・本村浩之. 2017. 鹿児島県本土から得られた九州初記録のエソ科魚類チョウチョウエソ. *Nature of Kagoshima* 43: 45–48. [Fujiwara, K. and Motomura, H. 2017. First records of *Synodus macrops* (Aulopiformes: Synodontidae) from coastal waters of Kyushu, southern Japan. *Nature of Kagoshima* 43: 45–48. (In Japanese)]

Motomura, H., Alama, U. B., Muto, N., Babaran, R. P. and Ishikawa, S. (eds). 2017. Commercial and bycatch market fishes of Panay Island, Republic of the Philippines. The Kagoshima University Museum, Kagoshima, University of the Philippines Visayas, Iloilo, and Research Institute for Humanity and Nature, Kyoto, Japan. 246 pp.

Paralepididae ハダカエソ科
Lestidium japonicum Tanaka, 1908

Original description: Tanaka (1908): 27.

Tanaka, S. 1908. Descriptions of eight new species of fishes from Japan. *Annotationes Zoologicae Japonenses*, 7 (1): 27–47.

Holotype (available): ZUMT 2013, off Misaki (Sagami Bay), Japan; 1908; collected by Kumakichi Aoki.

Paratype (available): ZUMT 2014 (1), same as holotype.

Remarks: The original description was based on 2 specimens and designated ZUMT 2013 as the holotype. ZUMT 2013 and ZUMT 2014 were the specimens that matched the scientific name and collection data from the ZUMT specimen ledger. The paratype is ZUMT 2014 (ICZN Art. 72.4.5).

原記載は2つの標本に基づいて記載され、ホロタイプに ZUMT 2013 を指定した。ZUMT 標本台帳から学名と収集データに一致した標本に ZUMT 2013 と ZUMT 2014 があつた。パラタイプは ZUMT 2014 である(ICZN Art. 72.4.5)。

Current status: Valid as *Lestrolepis japonica* (Tanaka, 1908) ハダカエソ

中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Ho, H.-C., Tsai, S.-Y. and Li, H.-H. 2019. The barracudina genera *Lestidium* and *Lestrolepis* of Taiwan, with descriptions of two new species (Aulopiformes: Paralepididae). *Zootaxa*, 4702 (1): 114–139.

Myctophidae ハダカイワシ科
Diaphus kuroshio Kawaguchi & Nafpaktitis, 1978 クロシオハダカ

Original description: Kawaguchi and Nafpaktitis (1978): 89, figs. 1–2.

Kawaguchi, K. and Nafpaktitis, B. G. 1978. A new lanternfish, *Diaphus kuroshio* (family Myctophidae), from the Kuroshio waters off Japan. *Japanese Journal of Ichthyology*, 25 (2): 89–91.

Holotype (available): ZUMT 54126 (female, 61.5 mm SL), 31°24.1'N, 136°52.4'E, cruise KH 77–2, sta. 18; 11 July 1977; collected with IKMT–10 ft., 3000 m wire out.

Paratypes (available): ZUMT 54127, ZUMT 54128, ZUMT 54129, ZUMT 54130 (4), 35°09.3'N, 139°16.8'E, cruise KT67-1, sta.207; 18 Jan. 1967; collected with ORI-net, 2000 m wire out (0–750 m).

Current status: Valid as *Diaphus kuroshio* Kawaguchi & Nafpaktitis, 1978 クロシオハダカ
Paxton, J. R. 1979. Nominal genera and species of lanternfishes (family Myctophidae).
Contributions in Science (Los Angeles), 322: 1–28.
中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、
秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–
III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]
Prokofiev, A. M., Emelyanova, O. R., Orlov, A. M. and Orlova, S. Y. 2022. A new species of
Diaphus associated with seamounts of the Emperor Chain, north-western Pacific Ocean
(Teleostei: Myctophiformes: Myctophidae). Journal of Marine Science and Engineering, 10:
1–13.

Gadiformes タラ目

Moridae チゴダラ科

Haloporphyrus oidema Tanaka, 1927 カッタイボヒゲ

Original description: Tanaka (1927): 796, pl. 171 (fig. 472).

田中茂穂. 1927. 日本産魚類図説. 41: 785–808, pls. 170–171. [Tanaka, S. 1927. Figures
and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa,
Kurile Islands, Korea, and Southern Sakhalin. Vol. 41: 785–808, pls. 170–171. (In Japanese
and English)]

Holotype (available): ZUMT 14352, Okinose, off Misaki (Sagami Sea), Kanagawa Pref.,
Japan.

Paratypes (available): ZUMT 14351 (1), same as holotype.

Remarks: In the original description, ZUMT 14352 was specified as the holotype. In addition,
ZUMT 14351 was added. This specimen is paratype (ICZN Art. 72.4.5).

原記載にはホロタイプに ZUMT 14352 を指定した。さらに ZUMT 14351 を加えた。
この標本はパラタイプである(ICZN Art. 72.4.5)。

Current status: Synonym of *Lepidion inosimae* (Günther, 1887) クロソコダラ

Nakaya K., Amaoka, K. and Abe, K. 1980. A Review of the Genus *Lepidion* (Gadiformes,
Moridae) from the Northwestern Pacific. Japanese Journal of Ichthyology, 27 (1): 41–47.

Cohen, D. M., Inada, T., Iwamoto, T. and Scialabba, N. 1990. FAO species catalogue. Vol. 10.
Gadiform fishes of the world (order Gadiformes). An annotated and illustrated catalogue of
cods, hakes, grenadiers and other gadiform fishes known to date. FAO (Food and Agriculture
Organization of the United Nations) Fisheries Synopsis, 10: x + 442 pp.

中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、
秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–
III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

中村潤平・山口 実・本村浩之. 2018. 琉球列島初記録のチゴダラ科魚類ソコクロダ
ラ. *Nature of Kagoshima* 45: 99–102. [Nakamura, J., Yamaguchi, M., and Motomura, H.
2018. First record of *Lepidion inosimae* (Gadiformes: Moridae) from the Ryukyu Islands,
Japan. *Nature of Kagoshima*, 45: 99–102. (In Japanese)]

Bregmacerotidae サイウオ科

Bregmaceros atlanticus japonicus Tanaka, 1908

Original description: Tanaka (1908): 42, Figured.

Tanaka, S. 1908. Descriptions of eight new species of fishes from Japan. *Annotationes Zoologicae Japonenses*, 7 (1): 27–47.

Holotype (available): ZUMT 2015, Sagami Bay, Japan; 1908; collected by Kumakichi Aoki.
Paratypes (lost): ZUMT 2016 (3), same as holotype.

Remarks: In the original description, ZUMT 2015 was designated as the holotype, and the description was based on 3 other samples. From the records of the ZUMT specimen ledger, ZUMT 2016 has the same collection data as the holotype, and 3 individuals were registered. ZUMT 2016 is a paratypes (ICZN Art. 72.4.5). These paratypes have not been located at this time, and are judged to have been lost.

原記載は ZUMT 2015 をホロタイプに指定し、他に 3 標本に基づいて記載された。ZUMT 標本台帳の記録から ZUMT 2016 は、ホロタイプと同じ収集データであり、3 個体が登録されていた。ZUMT 2016 はパラタイプである(ICZN Art. 72.4.5)。現時点でこの標本は確認できないため、失われたと判断した。

Current status: Valid as *Bregmaceros japonicus* Tanaka, 1908 サイウオ

田中茂穂. 1913. 日本産魚類図説. 11: 187–198, pls. 51–55. [Tanaka, S. 1913. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Island, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 11: 187–198, pls. 51–55. (In Japanese and English)]

Masuda, S. and Ozawa, T. 1979. Reexamination of the holotype of *Bregmaceros japonicus* Tanaka and *B. nectabanus* Whitley. *Japanese Journal of Ichthyology*, 25 (4): 266–268.

岡村 収・尼岡邦夫・三谷文夫 (編). 1982. 九州ーパラオ海嶺ならびに土佐湾の魚類. 日本水産資源保護協会, 東京. 436 pp. [Okamura, O., Amaoka, K. and Mitani, F. (eds). 1982. Fishes of the Kyushu-Palau Ridge and Tosa Bay. The intensive research of unexploited fishery resources on continental slopes. Japan Fisheries Resource Conservation Association, Tokyo. 435 pp. (In Japanese and English)]

岡村 収・北島忠弘 (編). 1984. 沖縄舟状海盆及び周辺海域の魚類 I. 日本水産資源保護協会, 東京. 414 pp. [Okamura, O. and Kitajima, T. (eds). 1984. Fishes of the Okinawa Trough and the adjacent water I. Japan Fishery Resources on Conservation Association, Tokyo. 414 pp. (In Japanese and English)]

- Torii A., Ozawa, T. and Harold, A. S. 2003. Morphological characters of *Bregmaceros japonicus* Tanaka, 1908 (Gadiformes: Bregmacerotidae). *Memoirs of the Faculty of Fisheries, Kagoshima University*, 52: 43–50.
- 中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. *Fishes of Japan with pictorial keys to the species I–III*, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]
- 園山貴之・荻本啓介・堀 成夫・内田喜隆・河野光久. 2020. 証拠標本および画像に基づく山口県日本海産魚類目録. 鹿児島大学総合研究博物館研究報告, 11: 1–152. [Sonoyama, T., Ogimoto, K., Hori, S., Uchida, Y. and Kawano, M. 2020. An annotated checklist of marine fishes of the Sea of Japan off Yamaguchi Prefecture, Japan, with 74 new records. *Bulletin of the Kagoshima University Museum*, 11: 1–152. (In Japanese with English abstract)]

Bregmaceros neonectabanus Masuda, Ozawa & Tabeta, 1986 クロハラサイウオ

- Original description: Masuda, Ozawa and Tabeta (1986): 393, fig. 3.
- Cohen, D. M., Inada, T., Iwamoto, T. and Scialabba, N. 1990. *FAO species catalogue. Vol. 10. Gadiform fishes of the world (order Gadiformes). An annotated and illustrated catalogue of cods, hakes, grenadiers and other gadiform fishes known to date.* FAO (Food and Agriculture Organization of the United Nations) Fisheries Synopsis, 10: x + 442 pp.
- Masuda, S., Ozawa, T., and Tabeta, O. 1986. *Bregmaceros neonectabanus*, a new species of the family Bregmacerotidae, Gadiformes. *Japanese Journal of Ichthyology*, 32 (4): 392–399.

Holotype (available): ZUMT 54587, stranded on Shingu Beach, Shingu Town, Fukuoka Pref., northern Kyushu, Japan; 27 Dec. 1965. (福岡県糟屋郡新宮町新宮海岸)

Paratypes (available): ZUMT 54588, ZUMT 54589, ZUMT 54590, same as holotype.

Current status: Valid as *Bregmaceros neonectabanus* Masuda, Ozawa & Tabeta, 1986 クロハラサイウオ

- Cohen, D. M., Inada, T., Iwamoto, T. and Scialabba, N. 1990. *FAO species catalogue. Vol. 10. Gadiform fishes of the world (order Gadiformes). An annotated and illustrated catalogue of cods, hakes, grenadiers and other gadiform fishes known to date.* FAO (Food and Agriculture Organization of the United Nations) Fisheries Synopsis, 10: x + 442 pp.
- Fricke, R., Allen, G. R., Andréfouët, S., Chen, W.–J., Hamel, M. A., Laboute, P., Mana, R., Tan, H. H. and Uyen, D. 2014. Checklist of the marine and estuarine fishes of Madang District, Papua New Guinea, western Pacific Ocean, with 820 new records. *Zootaxa*, 3832 (1): 1–247.
- 中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. *Fishes of Japan with pictorial keys to the species I–III*, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Macrouridae ソコダラ科
Coelorinchus kaiyomaru Arai & Iwamoto, 1979

Original description: Arai and Iwamoto (1979): 238, figs. 1–7.

Arai, T. and Iwamoto, T. 1979. A new species of the macrourid fish genus *Coelorinchus* from off Tasmania, New Zealand, and the Falkland Islands. Japanese Journal of Ichthyology, 26 (3): 238–246.

Paratypes (available): ZUMT 54203, ZUMT 54204, ZUMT 54205, south of Tasmania (47°15.1' S, 148°30.8 'E); 949 m depth (bottom temperature 5.54°C); 22 Dec. 1975; collected with otter trawl, by RV *Kaiyo Maru* (sta. T60).

Current status: Valid as *Coelorinchus kaiyomaru* Arai & Iwamoto, 1979 カイヨウマルソコダラ

Paulin, C. D., Stewart, A. L., Roberts, C. D. and McMillan, P. J. 1989. New Zealand fish a complete guide. National Museum of New Zealand Miscellaneous Series, 19: xiv + 279 pp., 8 pls.

尼岡邦夫・松浦啓一・稲田伊史・武田正倫・畑中 寛・岡田啓介 (編). 1990. ニューゼーランド海域の水族, 深海丸により採集された魚類・頭足類・甲殻類. 海洋水産資源開発センター, 東京. 411 pp. [Amaoka, K., Matsuura, K., Inada, T., Takeda, M., Hatanaka, H. and Okada, K. (eds). 1990. Fishes collected by the R/V Shinkai Maru around New Zealand. Japan Marine Fishery Resource Research Center, Tokyo. 410 pp. (In Japanese and English)]

Lionurus tomiyamai Okamura, 1963 トミヤマヒゲ

Original description: Okamura (1963): 31, figs. 8–10.

Okamura, O. 1963. Two new and one rare macrouroid fishes of the genera, *Coelorhynchus* and *Lionurus*, found in the Japanese waters. Bulletin of the Misaki Marine Biological Institute, Kyoto University, 4: 21–35.

Holotype (available): ZUMT 52045, eastern coast of Japan.

Current status: Valid as *Nezumia tomiyamai* (Okamura, 1963) トミヤマヒゲ

Cohen, D. M., Inada, T., Iwamoto, T. and Scialabba, N. 1990. FAO species catalogue. Vol. 10. Gadiform fishes of the world (order Gadiformes). An annotated and illustrated catalogue of cods, hakes, grenadiers and other gadiform fishes known to date. FAO (Food and Agriculture Organization of the United Nations) Fisheries Synopsis, 10: x + 442 pp.

中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Nakayama, N. 2020. Grenadiers (Teleostei: Gadiformes: Macrouridae) of Japan and adjacent waters, a taxonomic monograph. Megataxa, 3 (1): 1–383.

Ventrifossa longibarbata Okamura, 1982 オキナヒゲ

Original description: Okamura (1982): 157, pl. 94.

岡村 収・尼岡邦夫・三谷文夫 (編). 1982. 九州ーパラオ海嶺ならびに土佐湾の魚類. 日本水産資源保護協会, 東京. 436 pp. [Okamura, O., Amaoka, K. and Mitani, F. (eds). 1982. Fishes of the Kyushu-Palau Ridge and Tosa Bay. The intensive research of unexploited fishery resources on continental slopes. Japan Fisheries Resource Conservation Association, Tokyo. 435 pp. (In Japanese and English)]

Paratype (available): ZUMT 54272 (1), off Toi (Suruga Bay), Shizuoka Pref., Japan; 382–425 m depth; 20 Nov. 1978. (静岡県土肥沖, 駿河湾)

Current status: Valid as *Ventrifossa longibarbata* Okamura, 1982 オキナヒゲ

Cohen, D. M., Inada, T., Iwamoto, T. and Scialabba, N. 1990. FAO species catalogue. Vol. 10. Gadiform fishes of the world (order Gadiformes). An annotated and illustrated catalogue of cods, hakes, grenadiers and other gadiform fishes known to date. FAO (Food and Agriculture Organization of the United Nations) Fisheries Synopsis, 10: x + 442 pp.

岡村 収・北島忠弘 (編). 1984. 沖縄舟状海盆及び周辺海域の魚類 I. 日本水産資源保護協会, 東京. 414 pp. [Okamura, O. and Kitajima, T. (eds). 1984. Fishes of the Okinawa Trough and the adjacent water I. Japan Fishery Resources on Conservation Association, Tokyo. 414 pp. (In Japanese and English)]

Iwamoto, T. and Williams, A. 1999. Grenadiers (Pisces, Gadiformes) from the continental slope of western and northwestern Australia. Proceedings of the California Academy of Sciences, 51 (3): 105–243.

中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Nakayama, N. 2020. Grenadiers (Teleostei: Gadiformes: Macrouridae) of Japan and adjacent waters, a taxonomic monograph. Megataxa, 3 (1): 1–383.

Ophidiiformes アシロ目
Carapidae カクレウオ科
Carapus sagamianus Tanaka, 1908

Original description: Tanaka (1908): 40.

Tanaka, S. 1908. Descriptions of eight new species of fishes from Japan. Annotationes Zoologicae Japonenses, 7 (1): 27–47.

Holotype (available): ZUMT 1951 [not 1751], off Misaki (Sagami Bay), Kanagawa Pref., Japan; 1908.

Paratypes (available): ZUMT 1952 [not 1752] (7), same as holotype.

Remarks: The original description is based on 9 specimens including the holotype ZUMT 1751. The original description indicates that the holotype registration number is ZUMT 1751, but the correct number is ZUMT 1951. ZUMT 1952 in the ZUMT specimen ledger is recorded to contain 8 individuals with the same collected data as the holotype, but there are currently seven specimens, and one individual has been lost. These are paratypes (ICZN Art. 72.4.5).

原記載にはホロタイプ ZUMT 1751 を含む 9 標本に基づいて記載された。原記載ではホロタイプの登録番号が ZUMT 1751 と示されたが、正しい番号は ZUMT 1951 である。ZUMT 標本台帳の ZUMT 1952 は、ホロタイプと同じ収集データで 8 個体を含むと記録されているが、標本は現在 7 個体あり、1 個体は紛失している。これらはパラタイプである(ICZN Art. 72.4.5)。

Current status: Valid as *Encheliophis sagamianus* (Tanaka, 1908) カクレウオ
田中茂穂. 1913. 日本産魚類図説. 11: 187–198, pls. 51–55. [Tanaka, S. 1913. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Vol. 11: 187–198, pls. 51–55. (In Japanese and English)]
Trott, L. B. 1972. *Jordanicus sagamianus* (Tanaka) (Paracanthopterygii: Gadiformes): a redescription. UO (Japanese Society of Ichthyologists), 7: 1–7.
Markle, D. F. and Olney, J. E. 1990. Systematics of the pearlfishes (Pisces: Carapidae). Bulletin of Marine Science, 47 (2): 269–410.
Nielsen, J. G., Cohen, D. M., Markle, D. F., and Robins. C. R. 1999. FAO species catalogue. Volume 18. Ophidiiform fishes of the world (Order Ophidiiformes). An annotated and illustrated catalogue of pearlfishes, brotulas and other ophidiiform fishes known to date. FAO (Food and Agriculture Organization of the United Nations) Fisheries Synopsis, 18: xi +178 pp.
中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I–III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I–III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]

Ophidiidae アシロ科

Hoplobrotula badia Machida, 1990 クロヨロイイタチウオ

Original description: Machida (1990): 209, figs. 1–3.

Machida, Y. 1990. A new ophidiid species, *Hoplobrotula badia*, from Sagami Bay, central Japan. Japanese Journal of Ichthyology, 37 (3): 209–214.

Holotype (available): ZUMT 57621, Odawara Fish Market (Sagami Bay), Hayakawa, Odawara City, Kanagawa Pref., Japan.

Remarks: Although it is Manazuru in the original description, it was landed at the Odawara Fish Market.

原記載では真鶴となっているが、小田原魚市場に水揚げされたものであった。

Current status: Valid as *Hoplobrotula badia* Machida, 1990 クロヨロイイタチウオ

Nielsen, J. G., Cohen, D. M., Markle, D. F., and Robins. C. R. 1999. FAO species catalogue. Volume 18. Ophidiiform fishes of the world (Order Ophidiiformes). An annotated and illustrated catalogue of pearlfishes, brotulas and other ophidiiform fishes known to date. FAO (Food and Agriculture Organization of the United Nations) Fisheries Synopsis, 18: xi + 178 pp.

中坊徹次 (編). 2013. 日本海産魚類検索全種の同定 I-III. 第三版. 東海大学出版会、秦野. 2530 pp. [Nakabo, T. (ed). 2013. Fishes of Japan with pictorial keys to the species I-III, third edition. Tokai University Press, Hadano. 2530 pp. (In Japanese)]