

Report on the specimens of order Polymixiidae (Teleostei: Polymixiiformes) deposited in the Department of Zoology, The University Museum, The University of Tokyo

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Abstract

The collection of Polymixiidae (Teleostei: Polymixiiformes) deposited in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT) were re-identified in the present study. In total 28 specimens in 27 lots were discovered. No types are known for this family in ZUMT collection. A specimen of *Polymixia sazonovi* Kotlyar, 1992, collected from Suruga Bay, represents the first record from the area, and northernmost and easternmost records of the species. In addition, a single specimen (ZUMT 18855) of *Polymixia longispina* Deng, Xiong & Zhan, 1983 represents the first record of the species from Kagoshima Prefecture.

Introduction

The fish collection of family Polymixiidae (Teleostei: Polymixiiformes) which preserved in the Department of Zoology, The University Museum, The University of Tokyo (ZUMT) were re-identified in the present study. The family Polymixiidae is a deep-sea fish group, which only the family of the order Polymixiiformes. The family comprises a single genus *Polymixia* Lowe, 1836 with 10 species and an unidentified species known from southern Taiwan (Koeda 2019; Fricke et al. 2021). Four of these species have previously been recorded from Japanese waters (Hayashi 2013).

Materials and Methods

The specimens of Polymixiidae in ZUMT were re-identified in the present study, generally following Kotlyar (1993) and Hayashi (2013), together with some unpublished taxonomic studies, and confirmation of at least one diagnostic character.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 by species name. Japanese were given in parentheses for local name and personal name when these written in Japanese in the specimen ledger. The list contains ZUMT number, SL, collection locality, collection date, collector or donator, collection method, and remarks when available. No type specimens deposited for Polymixiidae in ZUMT.

Collection of Polymixiidae in ZUMT

Examination of the specimens of Polymixiidae deposited at ZUMT disclosed 27 lots with 28 specimens. We confirmed a single genus and 4 species which all known from Japan. No types are known for this family in ZUMT collection. A single specimen (ZUMT 54676; Fig. 1) of *Polymixia sazonovi* Kotlyar, 1992 collected from Suruga Bay was discovered from the collection. The present specimen represents the first record from the area, and northernmost and easternmost records of the species. In addition, a single specimen (ZUMT 18855; Fig. 2) of *Polymixia longispina* Deng, Xiong & Zhan, 1983 represents the first record of the species from Kagoshima Prefecture. A single specimen of *Polymixia japonica* Günther, 1877 (ZUMT 3485) which referred by Tanaka (1913) was not found.

Polymixiidae ギンメダイ科

Polymixia Lowe, 1836 ギンメダイ属

Polymixia berndti Gilbert, 1905 アラメギンメ

ZUMT 23369: 137.3 mm SL, Owase (尾鷲), Mie Pref., from 1922 to 1948, donated from K. Nakahara (中原鋼作) who is a director of Owase Girls High School of Owase Town, Mie Prefecture (三重県尾鷲町尾鷲高等女学校).

Remarks: This species previously known from Boso Peninsular, Sagami Bay, Kumano-nada Sea, and Tosa Bay in the Pacific coast of southern Japan (Kubo et al. 2012; Hayashi 2013). Local name “Shiro-mutsu (シロムツ)”.

Polymixia japonica Günther, 1877 ギンメダイ

ZUMT 2571: 129.1 mm SL, Nagasaki Pref., 24 Oct. 1909.

ZUMT 3696: 2 specimens, 125.3 mm SL, 128.9 mm SL, Nagasaki Pref. 11 Nov.

Remarks: Although the collection date of ZUMT 3696 was not recorded on the specimen ledger, it was estimated as having been during the period (1890's to 1920's) when Ichiro Kaneko (金子一狼) sent many fish specimens to Shigeo Tanaka (田中茂穂).

ZUMT 5086: 109.6 mm SL, Tokyo Fish Market (東京市場).

ZUMT 5087: 106.4 mm SL, **ZUMT 5088:** 104.8 mm SL, **ZUMT 5089:** 118.5 mm SL: Misaki (三崎), Kanagawa Pref., written as Soshu (相州).

ZUMT 5090: 115.6 mm SL, Odawara (小田原), Kanagawa Pref.

ZUMT 5091: 126.6 mm SL, **ZUMT 5092:** 110.3 mm SL, **ZUMT 5093:** 114.9 mm SL, **ZUMT 5094:** 116.3 mm SL, **ZUMT 5095:** 135.2 mm SL: locality unknown, probably Tokyo Fish Market.

ZUMT 9917: 112.0 mm SL, Wakayama Pref., from 1915 to 1948, donated from S. Sakaguchi (坂口総一郎) at Kaiso Junior High School (海草中学校).

ZUMT 21771: 164.9 mm SL, Amami-oshima Island (奄美大島) written as Oshima (大島), Jan. 1899, donated from A. Owston.

ZUMT 21825: 114.1 mm SL, Kagoshima Pref.

ZUMT 23816: 118.8 mm SL, Naya (納屋), Kagoshima City, Kagoshima Pref.

ZUMT 24269: 140.1 mm SL, Mimase (御豊瀬), Kochi Pref., 20 Oct. 1931, donated from T. Kamohara (蒲原稔治).

ZUMT 25367: 94.8 mm SL, off 200 hiro (尋) (= ca. 360 m) of Shima (志摩), collected at Toyohama Fish Market (豊浜漁港市場) at western coast of Chita Peninsular (知多半島), from 1912 to 1943, donated from S. Munekane (宗兼宗一) at Girls High School of Aichi Prefecture (愛知県女子師範学校).

ZUMT 54681: 109.4 mm SL, off Kunouzan (久能山), Suruga Bay (駿河湾), Shizuoka Pref., 9 May 1983, bottom trawl.

ZUMT 62060, 120.8 mm SL, **ZUMT 62061:** 131.6 mm SL, **ZUMT 62062:** 85.1 mm SL: no data (previously uncataloged).

Polymixia longispina Deng, Xiong & Zhan, 1983 キララギンメ

ZUMT 8517: 89.0 mm SL, Tanabe (田辺), Wakayama Pref., 23 Aug. probably 1920's, donated from N. Ui (宇井縫蔵).

ZUMT 18855 (Fig. 2): 118.8 mm SL, Kagoshima Pref.

Remarks: The species previously known from Suruga Bay, Kii Channel, Tosa Bay, Bungo Channel, and Okinawa Trough in Japanese waters. The present specimen represents the first record of the species from Kagoshima Prefecture.

Polymixia sazonomi Kotlyar, 1992 オカムラギンメ

ZUMT 54676 (Fig. 1): 239.9 mm SL, off Kunouzan, Suruga Bay, Shizuoka Pref., 9 May 1983.

Remarks: The species originally described on the basis of the specimens collected from Kyushu-Palau Ridge (Kotlyar 1992), and were reported from Atsumi Peninsular in Aichi Prefecture (Senou 2006), Yoron Island (Endo 2014) and Ishigaki-jima Island (Koeda and Hirasaka in press) in the Ryukyu Archipelago, and southern Taiwan (Koeda 2019) up to now. The present specimen represents the first record of the species from Suruga Bay, and northernmost and easternmost distributional records of the species.

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References

- Endo, H. 2014. *Polymixia sazonomi*. P. 60. In: Motomura, H. and Matsuura, K. (eds) Field guide to fishes of Yoron Island in the middle of the Ryukyu Islands, Japan. The Kagoshima University Museum, Kagoshima and the National Museum of Nature and Science, Tsukuba. (In Japanese)
- Fricke, R., Eschmeyer, W.N., 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 31 July 2021
- Hayashi, Y. (2013) Polymixiidae. Pp. 481, 1866–1867. In: Nakabo, T. (ed) Fishes of Japan with pictorial keys to the species, 3rd edition. Tokai University Press, Hadano. (In Japanese)
- Koeda, K. 2019. Family Polymixiidae. Pp. 342–346. In: Koeda, K. and Ho, H.-C. (eds) Fishes of southern Taiwan. National Museum of Marine Biology & Aquarium, Pingtung, Taiwan.
- Koeda, K. and Hirasaka, H. 2021. Records of two deep-sea fishes, *Beryx splendens* (Beryciformes; Berycidae) and *Polymixia sazonomi* (Polymixiiformes; Polymixiidae), collected from off Ishigaki-jima Island. Kuroshio Biosphere, 18 (2): 29–37. (In Japanese with English abstract)
- Kotlyar, A.N. 1992. A new species of the genus *Polymixia* from the submarine Kyushu-Palau Ridge, and notes on other representatives of the genus (Polymixiidae, Beryciformes). Voprosy Ikhtiologii, 32 (6): 11–26. (In Russian)
- Kotlyar, A.N. 1993. A new species of the genus *Polymixia* from the submarine Kyushu-Palau Ridge, and notes on other representatives of the genus (Polymixiidae, Beryciformes). Voprosy Ikhtiologii, 33 (3): 30–49. (In Russian)
- Kubo, Y., Kawabata, S., Asai, T., Hanasaki, K., Takeuchi, H., Okumura, D., Yamano, H. and Hosoya, K. 2012. Annotated checklist of the fish caught by an off-shore trawl fishery in the Kumanonada Sea, Mie Prefecture, Japan. Memoirs of the Faculty of Agriculture of Kinki University, 45: 193–239. (In Japanese with English abstract)
- Senou, H. 2006. *Diretmichthys parini* and *Polymixia sazonomi*. News letter of the Kanagawa Prefectural Museum of Natural History, 12 (2): 9. (In Japanese)
- Tanaka, S. 1913. Figures and descriptions of the fishes of Japan including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea, and Southern Sakhalin. Volo. 12: 203–220, pls. 56–59.



Figure 1. ZUMT 54676: *Polymixia sazonomi*, 239.9 mm SL, collected from off Kunouzan, Suruga Bay, Shizuoka Prefecture, Japan.



Figure 2. ZUMT 18855: *Polymixia longispina*, 118.8 mm SL, collected from Kagoshima Prefecture, Japan.