First Records of *Uropterygius oligospondylus* (Anguilliformes: Muraenidae) from Minami-iwo-to Island, Southern Japan

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Four specimens from Minami-iwo-to island of Volcano Islands were identified as *Uropterygius oligospondylus* Chen, Randall, and Loh in Loh et al., 2008. It is the first identified record from Japan and the northernmost record of the species. *Uropterygius oligospondylus* can be characterized by the following characters: total vertebrae 100–103; body gray with blackish reticular pattern; jaws teeth in two or three rows; anus close to mid-body; head 13.7–16.7% TL; trunk 32.8–36.6% TL; body depth at gill opening 5.8–8.3% TL; eye diameter 3.9–5.3% of head length; snout 16.2–20.3% of head length; and presence of a distinct notch above mid-eye. A new Japanese standard name “Kobu-kikai-utsubo” is proposed for the species. The position of the fourth infraorbital pores from original description should be revised as "far behind posterior end of eye".

**Key Words:** *Uropterygius*, diagnosis, Japan, northernmost record, Iwo Islands.

**Introduction**

The genus *Uropterygius* Rüppell, 1838, the type genus of the subfamily Uropterygiinae of Muraenidae, is known as worldwide taxon comprised of 21 species. Of all congeners, 18 species are distributed in the Indo-Pacific (Böhlke and Smith 2002; Loh et al., 2008; Smith 2012). Most of these inhabit shallow waters above 100 m depth, some species, e.g., *U. micropterus* (Bleeker, 1852) and *U. concolor* (Rüppell, 1838), can be found from tidepool and/or estuaries. Seven valid and one unidentified species (Japanese standard name: Hoshi-kikai-utsubo) of the genus have been recorded from Japanese waters based on reliable specimens (Hatooka 2013; Koeda and Hibino 2017; Koeda 2018; Tashiro et al., 2018). In addition, Wada and Motomura (2019) reported one species *Uropterygius cf. polyspilus* based on only partial underwater photograph from Yaku-shima island.

During a field survey organized by KK, two moray eels identified as *Uropterygius oligospondylus* Chen, Randall, and Loh in Loh et al., 2008 were collected from Minami-iwo-to island, Volcano Islands, southern Japan. In addition, two specimens of *U. oligospondylus* were found from museum collection collected by TS. These two were also collected from the same as above by the research team of the Tokyo Metropolitan Government and Tokyo Metropolitan University at 2007. Here these four specimens of the species are described in detail.

**Materials and Methods**

Counts and measurements follow Böhlke (1989). Most of measurements were made to the nearest 0.1 mm with digital calipers, and total, preanal, and tail lengths to the nearest 1 mm with 300- or 600-mm ruler. All vertebral counts were made from soft X-ray photos. Total length is abbreviated as TL. Sensory pores on head were counted both sides. Specimens for the present study are deposited in the Bishop Museum, Honolulu, Hawai‘i, U.S.A. (BPBM), the Kanagawa Prefectural Museum, Kanagawa, Japan (KPM), the National Museum of Nature and Science, Tsukuba (NSMT), the National Taiwan Ocean University, Laboratory of Aquatic Ecology, Division of Aquaculture (TOU-AE) and the Smithsonian Institution National Museum of Natural History, Department of Vertebrate Zoology, Division of Fishes, Washington D.C., U.S.A. (USNM).
Systematics

**Uropterygius oligospondylus** Chen, Randall, and Loh in Loh et al., 2008

[New Japanese standard name: Kobu-kikai-utsubo]
(Figs 1–3; Table 1)

**Uropterygius** sp.: Sasaki and Horikoshi 2007: 164 (Minami-iwo-to island, Japan).

**Uropterygius oligospondylus** Chen, Randall, and Loh in Loh et al., 2008: 141 (type locality: Taitung, Taiwan; Taiwan, Solomon and Vanuatu).

**Materials examined.** KPM-NI 21092, 406 mm TL, KPM-NI 21093, 438 mm TL, southern coast of Minami-iwo-to island, Volcano Islands, southern Japan, 25 June 2007, net-bag trap fishing, collected by T. Sasaki; NSMT-P 130223, 506 mm TL, NSMT-P 130224, 351 mm TL, southern coast of Minami-iwo-to island, Volcano Islands, southern Japan, 7 June 2017, hand-net trap fishing, collected by K. Kuriiwa.

**Description.** Counts and measurements are shown in Table 1. Body moderately long (Fig. 1), laterally compressed, its depth deep; tail not tapered prominently, its length slightly longer or shorter than lengths of head and trunk. Head large, 2.0–2.5 in trunk and 6.0–7.2 in TL; dorsal contour of head roughness, snout convex, a distinct broad notch above eye (Fig. 2); snout relatively short, 3.3–4.7 of eye, robust, its anterior tip blunt; anterior nostril extremely short tube, with a prominent but short dermal cover posterodorsally, located slightly posterior to snout tip; posterior nostril narrow ob-long slit (pressed tube) with labial flap, located at bottom of notch above mid-eye; eye small, circular, anterior to mid-jaw; mouth terminal, posterior rictus much behind posterior margin of eye; jaws not recurved, closing completely; lips smooth without cirri; interorbital region narrow; gill opening small, constructed, toward posteroventrally, located below mid-body. Teeth (Fig. 3) relatively long, mostly point-ed, slender, without serration along their edge; teeth of maxilla biserial anteriorly and triserial in posterior part, 4 or 6 teeth on middle row in smaller specimen (NSMT-P 130224, 351 mm TL) and 15 teeth in larger specimen (NSMT-P 130223, 506 mm TL); teeth of dentary biserial anteriorly and triserial in posterior part, 2 or 3 teeth on middle row in smaller specimen (NSMT-P 130224, 351 mm TL) and 9 teeth in larger specimen (NSMT-P 130223, 506 mm TL), teeth on outermost row relatively smaller than that on inner two rows; intermaxillary teeth plate arranged in 3 or 4 irregular transverse rows, teeth on vomer biserial anteriorly and uni-serial posteriorly. Sensory pores on head developed, moderate in size, arranged as follows: three supraorbital pores, anterior one ventrally on snout and posterior one above posterior margin of base of anterior-nostril tube; four infrarostral pores along upper lip, first below anterior nostril and fourth distinctly behind posterior end of eye (Fig. 2); six mandible pores; no pores on interorbital, preopercle, and temporal regions; one branchial pore. Fins extremely reduced, low dorsal and anal fins on posterior tip of tail.

| Table 1. Counts and measurements of *Uropterygius oligospondylus*. |
|---------------------------------------------------------------|
| **Present study** | **Type series** |
| KPM-NI 21092 | KPM-NI 21093 | NSMT-P 130223 | NSMT-P 130224 |
| Total length (mm) | 406 | 438 | 506 | 351 | 429–535 |
| Counts | | | | | |
| Predorsal vertebrae | 79 | 82 | 84 | 82 | 79–81 |
| Preanal vertebrae | 83 | 86 | 88 | 87 | 83–85 |
| Total vertebrae | 100 | 101 | 103 | 102 | 100–103 |
| Measurements | | | | | |
| As % of TL | | | | | |
| Preanal length | 49.8 | 50.9 | 50.8 | 49.5 | 48.9–50.8 |
| Tail length | 50.0 | 48.6 | 49.2 | 50.5 | 49.2–51.1 |
| Trunk length | 32.8 | 33.1 | 36.5 | 35.2 | 35.3–36.6 |
| Body depth at mid-anus | 5.8 | 5.5 | 7.5 | 7.3 | 6.3–7.1 |
| Body width at mid-anus | 3.6 | 3.9 | 4.9 | 4.0 | — |
| Body depth at gill opening | 6.9 | 5.8 | 7.9 | 7.0 | 6.5–8.3 |
| Body width at gill opening | 4.1 | 4.4 | 4.7 | 4.3 | — |
| Head length | 16.3 | 16.7 | 14.2 | 13.9 | 13.7–15.6 |
| As % of head length | | | | | |
| Snout length | 16.5 | 17.3 | 18.3 | 18.7 | 16.2–20.3 |
| Eye diameter | 4.7 | 5.2 | 3.9 | 5.3 | 4.3–4.7 |
| Upper jaw length | 34.7 | 35.6 | 38.8 | 40.0 | 35.7–43.5 |
| Lower jaw length | 33.2 | 34.5 | 37.5 | 39.4 | 35.7–41.7 |
| Interorbital width | 12.2 | 11.1 | 14.1 | 11.3 | 12.8–15.2 |
| Gill opening length | 4.7 | 4.2 | 4.5 | 5.1 | — |
| Postorbital length | 12.7 | 13.8 | 11.3 | 10.8 | — |

* Data from Loh et al. (2008)
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**Color when fresh.** Grey to brownish gray body with black thick reticular pattern, slightly faded ventrally; tip of snout and lower jaw brownish gray; inner mouth with similar pattern of body; margin of eye dark gray; iris yellowish (faded and difficult to see after re-refrigeration).

**Color after preservation.** Mostly same as fresh condition but becoming dark brown in older specimens (KPM-NI 21092, 21093); eye bluish gray covered with whitish semi-transparent membrane.

**Distribution and ecological note.** The species is distributed in the tropical western central Pacific Ocean from Taiwan (type locality); Solomon Islands; Vanuatu; Minami-iwo-to island of Volcano Islands, southern Japan. In Minami-iwo-to island, it inhabits intertidal zone (0–1 m depth) with many large boulders (Fig. 4).

**Remarks.** The four specimens were easily regarded as a member of the genus *Uropterygius* by its shorter trunk than tail length, restricted median fins around tip of tail, subequal mouth closing completely; and eye located above middle of mouth (McCosker and Smith 1997; Böhlke et al. 1999). *Uropterygius oligospondylus* was described by Loh et al. (2008) based on three specimens collected from vari-

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**Fig. 1.** Whole specimens of *Uropterygius oligospondylus* collected from Minami-iwo-to island, Volcano Islands, Japan. a, NSMT-P 130223, 506 mm TL; b, NSMT-P 130224, 351 mm TL.
ous localities in the western-central Pacific Ocean. Loh et al. (2008) defined its diagnosis with the following characters: total vertebrae 100–103; body gray with blackish reticular pattern; jaws teeth in three rows; anus close to mid-body; head 6.4–7.3, depth at gill opening 12.0–15.5, trunk 2.7–2.8 in TL; eye diameter 21.4–23.3, snout 4.9–6.2 in head length. The present four specimens can be identified as *U. oligospondylus* because most of these characters are included with the species. Although minor differences can be found in the vertebral counts and proportional features (Table 1), we consider all of that are intraspecific variations because the species was originally described only three specimens.

Loh et al. (2008) described position of infraorbital pores as “the first just behind anterior nostril, the last below posterior margin of eye.” But the position of the fourth infraorbital pores for all specimens of our study have different condition. So, we have re-checked the infraorbital pores from the holotype and paratypes. The last below posterior margin of eye should have been a mistake recorded in the original description, it should far behind posterior end of eye.

As stated above, Loh et al. (2008) defined the number of rows on jaws of *U. oligospondylus* is three rows in the diagnosis. However, they wrote “Dentary teeth biserial to triserial” in the original description. In addition, in the present materials, only 4 to 6 teeth on middle row of maxilla and 2 to 3 teeth on middle row of dentary in the smaller specimen (351 mm TL). Therefore, intraspecific and/or ontogenetic difference may be present in the character, so such teeth row character in diagnosis should be modified, future additional smaller specimens may have only biserial on maxilla and dentary. Although Loh et al. (2008) did not mentioned both in the diagnosis and the description, the distinct notch above mid-eye can be characterized for the species. Consequently, we redefine its diagnostic characters as the following characters: total vertebrae 100–103; body gray with blackish reticular pattern; jaws teeth in two or three rows; anus close to mid-body; head 13.7–16.7% TL; trunk 32.8–36.6% TL; body depth at gill opening 5.8–8.3% TL; eye diameter 3.9–5.3% of head length; snout 16.2–20.3% of head length; and presence of a distinct notch above mid-eye. In those characters, the total vertebral count and the notch above mid-eye are unique for the species.

The two specimens (KPM-NI 21092 and 21093) from Minami-iwo-to island were firstly reported by Sasaki and Horikoshi (2007) as *Uropterygius* sp. Next year the species was described as a new species but these specimens were not examined. Our research is the first record of *U. oligospondylus* from Japan, and the northernmost record of the species. In the island, *U. oligospondylus* inhabits intertidal zone which composed by boulders. All four specimens (NSMT-P 130223–130224 and KPM-NI 21092–21093) were caught by the hand-net/net-bag trap fishing with crushed...
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Fish *Decapterus muroadi* (Temminck and Schlegel, 1844)/bait *Grapsus tenuicrustatus* (Herbst, 1783) in the daytime (Fig. 5). Therefore, they may lurk in interstices of boulders, and sniff the smell of the bait. “Kobu-kikai-utsubo” is proposed for the species as a new Japanese standard name referring to its shape of the snout. “Kobu” is Japanese noun for bump.

**Comparative material.** *Uropterygius oligospondylus*: TOU-AE 1862, holotype, 448 mm TL, Taitung, Taiwan; BPBM 16129, paratype, 429 mm TL, Savo, Solomon Islands; USNM 352431, paratype, 535 mm TL, Tanna Island, Vanuatu.

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