

First Record of the Deep-sea Ophidiid Fish, *Tauredophidium hextii* (Pisces : Ophidiiformes) from the Pacific Ocean

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Nine specimens of the deep-sea ophidiid fish, *Tauredophidium hextii*, hitherto known only from two localities in the Indian Ocean are recorded for the first time the Pacific Ocean. Although slight differences were found in the counts of caudal vertebrae, the anal fin origins in relation to vertebral number and the length of the maxilla, there were no differences between the Pacific Ocean and the Indian Ocean specimens at the species level. This species inhabits abyssal floors in the Pacific and Indian Ocean at depths of about 1500 to 2400 m.

Introduction

The monotypic ophidiid fish genus *Tauredophidium* was originally described on the basis of three *T. hextii* specimens collected from the Bay of Bengal at a depth of 2397 m (Alcock, 1890). Although Shcherbachev (1980) reported 27 specimens of this species from the tropical Indian Ocean, the occurrence of *T. hextii* have not been recorded outside the Indian Ocean.

In 1968, the R/V Hakuho - Maru of the Ocean Research Institute, University of Tokyo trawled nine specimens of *T. hextii* at Solomon Rise in the central Pacific Ocean (Fig. 1). The aim of this paper is to compare them with previous descriptions of *T. hextii*, because they represent the first record of the species from the Pacific Ocean.

All measurements are straight - line measurements. Counts for vertical fin rays and vertebrae were taken from radiographs. The specimens are deposited in the fish collection of the

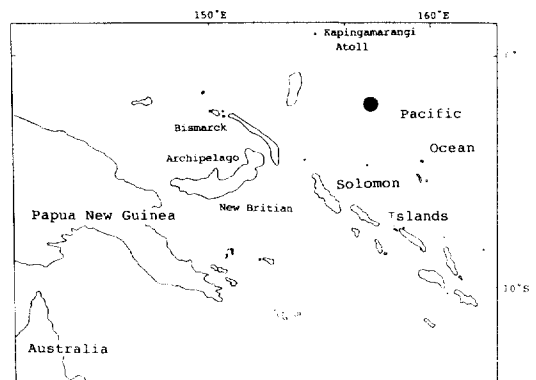


Fig. 1. Map showing locality of *Tauredophidium hextii* specimens examined in this study (●).

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***Tauredophidium hextii* Alcock, 1890 (Figs. 2, 3)**

Tauredophidium hextii Alcock, 1890 : 213 (original description ; type locality : Bay of Bengal) ; Cohen and Nielsen, 1978 : 20 ; Shcherbachev, 1980 : 111.

Materials examined : BSKU 82885 – 82893, 7 males and 2 females with ripened eggs, 52.8 – 82.2 mm standard length (SL), 01° 59' 0" S, 157° 12' 3" E (Solomon Rise, central Pacific Ocean), R/V Hakuho – Maru cruise no. KH 67 – 05, st. 19, 3 m – span beam trawl, depth 1610 m, Jan. 4, 1968.

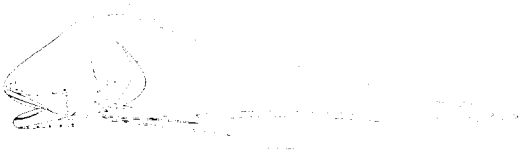


Fig. 2. Schematic drawing of *Tauredophidium hextii*, BSKU 82892, 72.1 mm SL. Bar indicates 10 mm.

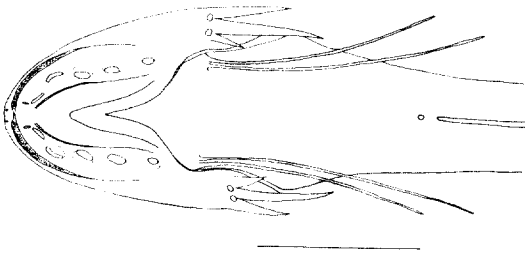


Fig. 3. Schematic drawing of ventral view of head and body of *Tauredophidium hextii*, BSKU 82892. Bar indicates 10 mm.

Description : Counts and measurements are given in Table 1.

Body elongated, compressed, tapering posteriorly (Fig. 2). Head massive. Eyeballs much reduced, extremely small, sometimes repre-

sented by pigmented spots under skin in orbital region. Snout broad, its tip round in lateral view. Anterior and posterior nostrils large, without flap. Total cephalic sensory pores 15 : supraorbital pore 1, infraorbital pore 6, preoperculo-mandibular pores 8 (6 on mandible, 2 on preopercle) (Figs. 2 and 3). Mouth large, nearly horizontal. Upper jaw slightly projecting beyond tip of lower jaw.

Posterior end of maxilla extending backward far beyond posterior margin of dermal window of eye. Occipital crest forming a blunt ridge. Second neural spine elongate, its tip slightly projecting from dorsal contour. Gill opening large, opercular membranes broadly united with isthmus. Operculum with a long, stout, sharp – pointed spine.

Preoperculum with 3 elongate spines on its lower margin, middle one longest.

Teeth on jaws, palatine and vomer small, conical, forming bands. One median and a pair of small tooth patches in basibranchial. Vertical fins confluent around tip of tail.

Origin of dorsal fin just behind pectoral fin base. Pectoral fin long, normal, extending backward beyond origin of anal fin. Pelvic fin bases widely separated, inserted slightly behind lower angle of preoperculum. Two pelvic fin rays ; inner one longer, extending far beyond origin of anal fin. Tip of caudal fin pointed. Head and body covered with small deciduous scales. Lateral line indistinct.

Color in 70% ethyl alcohol : Head and body uniformly brownish yellow, opercular membranes, underside of head and belly much darker. All fins pale. Orobranchial cavity brown. Stomach and peritoneum dark brown. Intestine creamy yellow with many small, dark brown melanophores.

Distribution : The Bay of Bengal (16° 11' 15" N, 82° 3' 30" E, depth 2397 m) (Alcock,

1890), the East Indian Ridge (11° 24' - 19° 45' S, 87° 54' - 88° 59' E, depth 1500 - 1840 m) (Shcherbachev, 1890) and the tropical central Pacific Ocean.

Remarks : The ophidiid genus *Tauredophidium* is monotypic, and unique in the tribe Sirembini of the subfamily Neobythitinae in having widely separated and posteriorly positioned pelvic fin insertions and reduced eyes (Cohen and Nielsen, 1978). Although Cohen and Nielsen (1978) regarded that this genus is closely similar to *Xylacyba*, the latter is known to have developed eyes, a single, elongate spine

at the lower angle of the operculum and closely separated pelvic fin bases (Cohen and Nielsen, 1978 ; Shcherbachev, 1980 ; Machida, 1989). Our specimens were easily identified as a species of *Tauredophidium*.

Meristic counts of our specimens generally agreed with those of *T. hextii* specimens from the Indian Ocean described by Alcock (1890) and Shcherbachev (1980) (Table 1). Our specimens possessed 67 - 77 dorsal and 59 - 66 anal fin rays, 44 - 46 caudal vertebrae and somewhat elongate maxillae (14.2 - 16.3% of head length). Although Alcock (1890) stated that no pseudobranchial

Table 1. Counts and proportional measurements of *Tauredophidium hextii*

Characters	Present study	Alcock(1890)	Shcherbachev(1980)
Number of specimens	9	3	5
SL (mm)	52.8 - 80.4	-	80.0 - 106.0
Counts			
Dorsal fin rays	67 - 77	64	68 - 73
Anal fin rays	59 - 66	58	59 - 62
Caudal fin rays	5 + 3 = 8	-	8 - 9
Pectoral fin rays	18 - 19	18	16 - 18
Pelvic fin rays	2	2	2
Branchiostegal rays	8 - 9	-	-
Vertebrae	10 - 11 + 44 - 46 = 54 - 56	-	10 - 11 + 41 - 43 = 52 - 53
Pseudobranchial filaments	3 - 5	-	3 - 4
Gill rakers on 1st arch	iii - iv + 9 - 13 + ii - v	-	iii - iv + 1 + 8 - 12 + iii - iv
In % of SL			
Head length	25.4 - 27.5(26.4 ± 1.0)*	-	23.6 - 25.5
Body depth (at pectoral fin base)	19.7 - 22.7(21.0 ± 0.9)	-	-
Body depth(at anal fin origin)	14.3 - 17.2(16.0 ± 0.9)	-	13.4 - 16.5
Maxillary length	14.2 - 16.3(15.3 ± 0.6)	-	12.8 - 13.5
Predorsal length	27.1 - 32.0(29.6 ± 1.9)	-	27.6 - 32.1
Prepectoral length	27.0 - 30.4(28.3 ± 1.2)	-	-
Prepelvic length	18.7 - 23.2(21.0 ± 1.3)	-	17.4 - 19.8
Preanal length	38.3 - 42.1(40.2 ± 1.2)	-	39.2 - 42.5
Pectoral length	17.9 - 22.9(19.9 ± 1.7)	-	17.1 - 19.4
Pelvic length	27.2 - 31.6(29.2 ± 1.2)	-	25.6 - 32.6
In % of head length			
Head depth	71.8 - 88.2(79.9 ± 4.9)	-	-
Head width	61.2 - 77.1(68.0 ± 5.5)	-	-
Eye diameter	3.7 - 5.8(4.6 ± 0.8)	-	-
Length of opercular spine	37.4 - 56.7(44.3 ± 8.4)	-	-
Length of maxilla	54.9 - 61.5(57.9 ± 2.2)	-	-

* mean ± SD

filaments were present in the type specimens, Shcherbachev (1980) reported that his specimens had three to four filaments. We confirmed the presence of three to five short pseudo-branchial filaments in our specimens. According to Shcherbachev (1980), the anal fin originates from below the 11th to 13th vertebrae. In our fishes, the anal fin origin is located below the 12th to 14th vertebrae. The differences in the counts of caudal vertebrae and anal fin origins, and the length of maxilla are too small to discriminate two forms from the Pacific and the Indian Ocean. This study, representing the third record for the species, clearly shows that *T. hextii* is more widely distributed on abyssal floors in the Pacific and Indian Oceans at depths of about 1500 to 2400 m.

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태평양산 *Tauredophidium*속 어류 1 미기록종, *T. hextii*

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Ophidiidae과에 속하는 어류 중 지금까지 인도양에서만 서식하고 있는 것으로 알려져 있던 *Tauredophidium hextii*가 태평양에서 9개체가 최초 확인되었다. 본 표본은 인도양산과 비교하여 미추골의 수, 뒷지느러미가 시작되는 추골위치, 상악의 길이 등에서 약간의 차이가 나타나 두부의 형태, 퇴화된 눈, 전새개골과 새개골의 가시수 및 형태, 배지느러미의 위치 등에서 *T. hextii*와 일치하였다. 본 종은 인도양과 태평양의 수심 약 1500 - 2400m의 심해에서 서식한다.