

## Records of rare scabbardfish (Perciformes: Trichiuridae) from southern Taiwan

Keita Koeda<sup>1\*</sup> and Hsuan-Ching Ho<sup>1,2</sup>

<sup>1</sup>National Museum of Marine Biology & Aquarium, 2 Houwan Rd., Checheng, Pingtung 944, Taiwan

<sup>2</sup>Graduate Institute of Marine Biology, National Dong Hwa University, Checheng, Pingtung 944, Taiwan

\*Corresponding author. E-mail: hatampo@gmail.com.

### Abstract

Specimens of two scabbardfish (Trichiuridae), *Evoxymetopon poeyi* Günther, 1887 and *Evoxymetopon taeniatus* Gill, 1863, were recently collected from waters of southern Taiwan. Neither species has been recorded frequently in Taiwan, and their morphology is poorly documented. Therefore, detailed descriptions of both species are provided herein based on these recently collected Taiwanese specimens.

**Key words:** *Evoxymetopon poeyi*, *Evoxymetopon taeniatus*, ichthyology, Trichiuridae, morphology, scabbardfish, taxonomy

### Introduction

The genus *Evoxymetopon* Bloch and Schneider, 1801 belongs to the family Trichiuridae and comprises four valid species (Nakamura and Parin, 1993, 2001; Chakraborty et al., 2006). The upper profiles of the heads of members of the genus *Evoxymetopon* are convex (i.e., rising steeply from the tip of the snout to the dorsal fin origin), forming a prominent sagittal crest. Also, the posterior ends of their gill covers are broadly rounded, and their first anal-fin spines are scale-like in

shape. Finally, their pelvic fins are scale-like, and they have small, forked caudal fins (Nakamura and Parin, 1993, 2001). The species are known as benthopelagic on continental shelf and slope. No special fishery for species of this genus, thus only a handful information is known about the biology and morphology.

*Evoxymetopon poeyi* Günther, 1887 and two specimens of *E. taeniatus* Gill, 1863 were recently collected from water off southern Taiwan. Although the

former was previously found in Japan, Taiwan, and Mauritius, and the latter has been collected from Northwestern Asia (Pacific Ocean) and the Western Atlantic Ocean, only very few records exist, and their morphology is still poorly described. Therefore, these two Taiwanese species are described in detail herein.

### Materials and Methods

The three specimens were obtained from southern Taiwan (see specimens examined). Collected specimens are dead when obtained. Counts and measurements follow Sakiyama et al. (2011). Measurements were made to the nearest 0.1 mm with digital calipers (Mitutoyo corporation) when possible, but some characters were measured to the nearest 1 mm with traditional calipers or measuring tape. Standard, total, and fork lengths are abbreviated as SL, TL, and FL,

respectively. The morphological descriptions are based on the specimens collected from Taiwan. The specimens of the genus *Evoxymetopon* examined in this study are deposited at the National Museum of Marine Biology & Aquarium (NMMB-P).

### Results

#### Family Trichiuridae

#### *Evoxymetopon* Gill, 1863

#### *Evoxymetopon poeyi* Günther, 1887

卜氏窄鰓帶魚

Figures. 1-2; Table 1

*Evoxymetopon poeyi* Günther, 1887: 39, pl. 43 (type locality: Java, Indonesia); Nakamura and Parin 1993:88; Chakraborty et al. 2006: 137; Nakabo and Doiuchi, 2013:1644; Chiang et al. 2014:292, unnumbered fig.; Hata et al. 2016:321.



**Fig. 1.** Fresh specimen of *Evoxymetopon poeyi* from waters off Kenting, Taiwan. NMMB-P26093: 1840 mm SL, 1885 mm TL, and 1860 mm FL.



**Fig. 2.** Head of *Evoxymetopon poeyi* (upper: NMMB-P26093, 1840 mm SL) and *E. taeniatus* (lower: NMMB-P27279, 1483 mm SL) collected from southern Taiwan.



**Fig. 3.** Fresh specimen of *Evoxymetopon taeniatus* from waters off Dong-gang, Taiwan. NMMB-P27295: 1315 mm SL, 1353 mm TL, and 1335 mm FL.

**Specimen examined.** NMMB-P26093, 1840 mm SL (1885 mm TL and 1860 mm FL), male (semen leaked out), collected off Kenting (21°54'N, 120°46'E), Pingtung, South China Sea, Taiwan, 25 May 2017, collected by Michael Lin.

**Description of Taiwanese specimen.**

Counts and measurements are shown in Table 1. Body extremely elongate, deep, strongly compressed, ribbon-like, and tapering to a point posteriorly with a small, forked caudal fin. Body depth 12.7 times in SL. Head strongly pointed; profile convex steeply rising from tip of snout to dorsal-fin origin, forming a prominent sagittal crest. Head length 8 times in SL. Interorbital space keeled. A single, slit-like nostril. Mouth large, with the gape extending to beneath anterior half of eye. Jaws not protractile; lower jaw extends anteriorly to upper jaw. Three pairs of strong, fang-like teeth in anterior part of upper jaw. Anus located anterior to center of body.

Dorsal fin low and long, beginning shortly behind posterior margin of eye. First dorsal-fin spine elongated, about 1.3 times of head length; anterior spinous portion slightly shorter than posterior soft portion (two portions). Anal fin low, beginning shortly behind anus; first anal-fin ray scale-like, with the other rays embedded. Pectoral fins short and low in position. Pelvic fins scale-like, without rays. Singular lateral line, mostly running along center of body. Scales absent. Color

generally silver, though faintly dusky at head and caudal-peduncle when fresh. First elongated dorsal-fin spine blackish.

**Distribution.** *Evoxymetopon poeyi* is only known from scattered localities, including Japan, Taiwan, Indonesia, and the Cook Islands in the Pacific Ocean and Mauritius and Réunion Island in the Indian Ocean (Froese and Pauly, 2017, online version). This species was previously found off Eastern Taiwan (Chiang et al., 2014), and its range evidently extends into southern Taiwan based on the present study.

**Remarks.** The characteristics of the present Taiwanese specimen is well consistent with the diagnosis of *E. poeyi* given by Nakamura and Parin (1993) and Nakabo and Doiuchi (2013): first dorsal-fin spine elongated, slit-like nostrils, and body depth 12.6 times in SL. Although *E. poeyi* is similar in appearance to *Evoxymetopon macrophthalmum* Chakraborty, Yoshino and Iwatsuki, 2006, in which the only known holotype is from Okinawa-jima island, the former is clearly distinguishable from the latter in having 1) an eye diameter 5.5-5.8 times its head length (vs. 4.5 in the latter), 2) a convex upper head profile rising steeply from the tip of the snout (vs. moderately rising), and 3) a keeled interorbital zone (vs. not keeled) (Chakraborty et al., 2006; Nakabo and Doiuchi, 2013).

Although Shen and Wu (2011) reported *E. poeyi* in Taiwan, they only

presented one monochrome drawing in their manuscript. Chiang et al. (2014) documented *E. poeyi* from off the eastern coast of Taiwan with a photograph of a landed individual (FRIP 21653, 177 cm FL). Therefore, the present specimen represents the first record of this species from southern Taiwan, and the first record of this species in the South China Sea.

***Evoxymetopon taeniatus* Gill, 1863**

條狀窄鰓帶魚

Figures 2-3; Table 1

*Evoxymetopon taeniatus* Gill, 1863: 228 (type locality: Cuba); Nakamura and Parin, 1993:89; Chen 2003:204; Chakraborty et al. 2006:137; Sakiyama et al. 2011:105, figs. 5-6; Nakabo and Doiuchi 2013:1644; Chiang et al. 2014:292, unnumbered fig.

**Specimens examined (n=2).** NMMB-P27279: 1483 mm SL (1520 mm TL, 1499 mm FL). NMMB-P27295: 1315 mm SL (1353 mm TL, 1335 mm FL). Both collected off Dong-gang (22°39'N, 120°24'E), Pingtung, South China Sea, Taiwan, 20 June 2017, purchased by H.-C. Ho at Dong-gang fish market.

**Description of Taiwanese specimens.** Counts and measurements are shown in Table 1. Body extremely elongate, deep, strongly compressed, ribbon-like, and tapering to a point posteriorly with a small, forked caudal fin. Body depth at

pectoral-fin base 11.8-11.9 times in SL. Head moderately pointed; profile convex and rising steeply from tip of snout to dorsal-fin origin forming a prominent sagittal crest. Head length 7.8-8.1 times in SL. Interorbital zone keeled. A single, crescent nostril. Mouth large, with the gape extending to beneath anterior half of eye; jaws not protractile, with lower jaw extending anteriorly to upper jaw. Three pairs of strong, fang-like teeth in anterior part of upper jaw. Anus located anterior to center of body.

Dorsal fin low and long, beginning above center of eye. First dorsal-fin spine not elongated and anterior spinous portion longer than posterior soft portion (two portions continuous). Anal fin low, beginning shortly behind anus; first anal-fin ray scale-like, other rays embedded. Pectoral fins short and low in position. Pelvic fins scale-like and without rays. Singular lateral line running mostly along center of body. Scales absent. Color generally silver and faintly dusky at caudal-peduncle when fresh. Anterior portion of dorsal-fin membrane blackish.

**Distribution.** *Evoxymetopon taeniatus* is known from the central Atlantic Ocean and northwestern Pacific Ocean off Japan, Taiwan, Korea and the Philippines (Froese and Pauly, 2017, online version). This species was previously found off Eastern Taiwan (Chiang et al., 2014), and its range evidently extends into southern Taiwan based on the present study.

**Remarks.** The characteristics of the two present specimens are well consistent with the diagnosis of *E. taeniatus* of Nakamura and Parin (1993; 2001) and Nakabo and Doiuchi (2013): first dorsal-fin spine not elongated, crescent nostrils, and body depth 11.7-11.9 times in SL. *E. taeniatus* is relatively similar morphologically to *E. poeyi* but is easily distinguished by the aforementioned characteristics. Although Shen and Wu (2011) documented *E. taeniatus* in Taiwan, and even provided a photograph of the specimen, the locality was not mentioned. Also, Chiang et al. (2014) reported a single individual of *E. taeniatus* off the eastern coast of Taiwan (FRIP21653, 174 cm FL). Therefore, the present specimen represents the first reliable record of this species from southern Taiwan.

### Acknowledgements

We are especially grateful to R.-R. Chen, J.-F. Huang, J.-T. Lin, and A. Koeda (NMMB-P) for curatorial assistance. The present study was supported in part by a JSPS Overseas Research Fellowships (29-304) to K.K.

### References

- Chakraborty, A., T. Yoshino & Y. Iwatsuki Y. 2006. A new species of scabbardfish, *Evoxymetopon macrophthalmus* (Scombroidei: Trichiuridae), from Okinawa, Japan. *Ichthyological Research*, 53(2): 137-142.
- Chen, C.-H. 2003. Fishes of Penghu. Fisheries Research Institute, Council of Agriculture, Keelung. 379 pp. (in Chinese)
- Chiang, W.-C., P.-L. Lin, W.-Y. Chen & D.-C. Liu. 2014. Marine fishes in eastern Taiwan. Fisheries Research Institute, Keelung. 337 pp. (in Chinese)
- Froese, R. & D. Pauly (eds.). 2017. FishBase. World Wide Web electronic publication. www.fishbase.org, version (06/2017)
- Hata, H., M. Takayama & H. Motomura. 2016. First records of *Evoxymetopon poeyi* (Perciformes: Trichiuridae) from Kagoshima Prefecture, southern Japan. *Nature of Kagoshima*, 42: 321-325. (in Japanese)
- Nakabo, T. & R. Doiuchi. 2013. Trichiuridae. Pp. 1644-1647, 2221-2224. In: Nakabo, T. (ed): Fishes of Japan with pictorial keys to the species, third edition. Tokai University Press, Hadano, Japan. (In Japanese)
- Nakamura, I. & N.V. Parin. 1993. FAO species catalogue. Snake mackerels and cutlassfishes of the world (families Gempylidae and Trichiuridae). FAO Fishes Synopsys, 125 (15): i-viii + 1-136.
- Nakamura, I. & N.V. Parin. 2001. Trichiuridae. Pp. 3709-3720. In: Carpenter, K.E. & V.H. Niem (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. Rome, Italy, FAO.
- Sakiyama, T., H. Senou, A. Mishiku, Y. Kanou & T. Itoh T. 2011. First records of two species of the Myliobatid rays, *Atrobatus flagellum* and *Mobula diabolus* from Sagami Bay with a certain record of rare trichiurid fish, *Evoxymetopon taeniatus*. *Bulletin of the Kanagawa Prefectural Museum of Natural History*, 32: 101-108. (In Japanese with English abstract)
- Shen, S.-C. & Wu, K.-Y. (2011) *Fishes of Taiwan*. National Museum of Marine Biology & Aquarium, Checheng, 896 pp. (in Chinese)

**Table 1.** Counts and measurements of *Evoxymetopon poeyi* and *E. taeniatus* collected from southern Taiwan.

	<i>E. poeyi</i>		<i>E. taeniatus</i>	
	Off Kenting		Off Dong-gang	
	NMMB-P26093		NMMB-P27279	NMMB-P27295
Standard length (SL; mm)	1840		1483	1315
Total length (mm)	1885		1520	1353
Fork length (mm)	1860		1499	1335
Counts				
Dorsal fin elements	90		81	82
Pectoral fin rays	12		12	12
Pelvic fin rays	1		1	1
External anal fin rays	17		20	18
Caudal fin rays	8+7		8+7	8+7
Measurements (% of SL)				
Pre-anus length	49.5		50.0	48.1
Head length	12.5		12.4	12.8
Snout length	4.9		4.5	4.8
Postorbital length	6.1		6.0	6.0
Preopercle length	1.7		1.9	2.1
Upper-jaw length	4.5		4.9	4.5
Body depth at pectoral-fin base	7.9		8.5	8.4
Body width at pectoral-fin base	2.0		2.2	2.1
Body depth at anus	7.0		7.4	7.9
Body width at anus	1.6		1.7	1.7
First dorsal-fin spine length	16.8		2.6	2.6
Pre-dorsal-fin length	9.5		7.5	7.9
Dorsal-fin base length	92.4		94.9	93.6
Orbit diameter	2.3		1.9	2.0
Suborbital width	0.9		1.1	1.3
Interorbital width	1.7		1.9	1.9
Depth above lateral line at anus	3.8		4.1	4.5
Depth below lateral line at anus	3.3		3.6	3.7
Pre-pectoral-fin length	13.3		13.4	13.8
Pectoral-fin base length	1.0		1.4	1.4
Pectoral fin length	6.5		damaged	6.6
Pre-pelvic-fin length	16.7		17.1	17.7
Pelvic-fin length	1.2		0.8	0.9
Pre-anal-fin length	50.3		52.1	49.2
Anal-fin base length	48.5		47.3	51.1
Caudal-peduncle depth	0.5		0.5	0.5
Caudal-peduncle length	1.4		1.8	1.9
Tail length	48.0		50.1	52.0