

## First record of *Gymnothorax minor* from Vietnam (Anguilliformes: Muraenidae)

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**Abstract.** Two specimens of *Gymnothorax minor* (Temminck & Schlegel, 1846) (270.5 and 363.0 mm of total length) were found from Nha Trang, southern Vietnam. These specimens represent the first record of the species from Vietnam and expand the distributional area of the Northern population southward.

**Key words:** Muraenidae, Vietnam, new record, *Gymnothorax minor*, distributional expansion

### Introduction

The *Gymnothorax reticularis* species group, defined by dark vertical bands on body and serrate teeth on jaws and intermaxillary region (Smith & Böhlke, 1997), are known as one of the major group of dark banded muraenids (Allen & Erdmann, 2012). Recently Hibino *et al.* (2015) reported distributional expansion of two species belonging to the species group, *Gymnothorax reticularis* Bloch, 1795 and *Gymnothorax mccoskeri* Smith & Böhlke, 1997. *Gymnothorax minor* (Temminck & Schlegel, 1846), the most common species in the species group, has been recorded from Japan to southern Australia but no records have been occurred around equatorial region between 20°N and 10°S (Smith & Böhlke, 1997). During our ichthyofaunal survey, two specimens of *G. minor* were found from Vietnam. We herein report these two species as the first record from Vietnam and discuss distributional expansion

of the species.

### Materials and methods

The morphometric measurements were made either with a 300 mm or 600 mm ruler to the nearest 0.1 mm for total and tail lengths and with a digital caliper to the nearest 0.01 mm for all other measurements. Counts and measurements follow Böhlke (1989). Total length is abbreviated as TL. Vertebral counts follow Böhlke (1982), and were made from soft-X ray photos. The present materials are deposited at Fisheries Research Laboratory, Mie University, Japan (FRLM) and the Kagoshima University Museum, Japan (KAUM). Date of publication follow Smith & Böhlke (1997).

### Results and discussion

#### *Gymnothorax minor*

(Temminck & Schlegel, 1846)

(Figs. 1 and 2; Table 1)

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Fig. 1. Preserved condition of *Gymnothorax minor*, FRLM 31626, 363.0 mm TL, Nha Trang, southern Vietnam

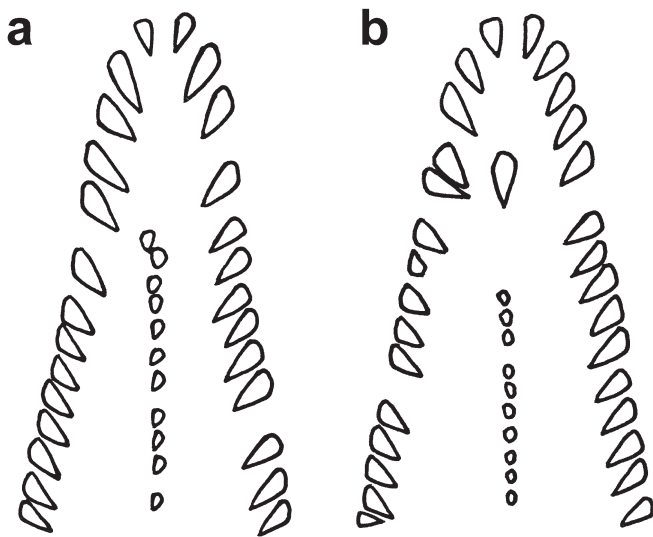


Fig. 2. Teeth arrangement of maxilla and palatal area of *Gymnothorax minor*. **a** FRLM 31626, 363.0 mm TL (mature male); **b** FRLM 31627, 270.5 mm TL (immature female).

Table 1. Counts and measurements of *Gymnothorax minor*

	<i>Gymnothorax minor</i>	
	FRLM 31626	FRLM 31627
Total length (mm)	363.0	270.5
Counts		
Predorsal vertebrae	5	5
Preanal vertebrae	56	54
Total vertebrae	136	139
Measurements		
As % of total length		
Head length	12.3	14.6
Preanal length	44.9	44.5
Trunk length	32.6	30.0
Tail length	55.1	55.5
Predorsal-fin length	9.4	10.9
Body depth at gill-opening	4.6	4.7
Body depth at mid-anus	4.2	3.6
Body width at gill-opening	3.6	2.6
Body width at mid-anus	3.5	3.2
As % of head length		
Snout length	16.4	13.2
Eye diameter	9.9	8.9
Upper-jaw length	39.5	32.0
Gill-opening length	8.0	6.0
Interorbital width	13.4	10.5

Material examined: FRLM 31626, 363.0 mm TL, male, FRLM 31627, 270.5 mm TL, immature female, bottom trawl, fish landing port at Nha Trang city, southern Vietnam.

Counts and measurements of the present specimens are shown in Table 1. The present specimens are included in the *Gymnothorax reticularis* group defined by Smith & Böhlke (1997) by having dark vertical bands on body and serrate teeth on jaws and intermaxillary region. They can be easily identified as *G. minor* by their shape of dark bands on body (the bands not separated into dorsal and ventral parts, well distinct ventrally and somewhat obscure dorsal-

ly with numerous small dots) and vertebral counts (vertebral formula 5-54-139 and 5-56-136) (Smith & Böhlke, 1997; Smith, 2012). All species belonging to the *G. reticularis* group have sexual dimorphism (Smith & Böhlke, 1997), females and immature males have a large tooth on mid-intermaxillary region but mature males lack tooth there. The present specimens, FRLM 31626 and FRLM 31627, are concluded as mature male and female, respectively, because of their arrangement of teeth on mid-intermaxillary region (Fig. 2), and possession of immature eggs (diameter less than 0.1 mm).

*Gymnothorax minor* has been known as an antitropical species and its geographical records from the Northern Hemisphere (Northern population of the species) were restricted from Japan to southern China south to 20°N (Smith & Böhlke, 1997; Böhlke & McCosker, 2001). Therefore, the present report represents the first record of the species from Vietnam and expands the distributional area of the Northern population of the species southward. Smith & Böhlke (1997) mentioned that the two populations (Northern and Southern populations) are found intraspecifically and they are distinguishable by their counts of total vertebrae (135–143 in the Northern population and 129–135 in the Southern population). The vertebral counts of the present specimens agree well with those of the Northern population and do not overlap with the Southern population (Table 1). In other case, *G. mccoskeri* is also distributed in both the Northern and the Southern hemispheres except for equatorial region, but there are no morphological differences between both populations except for a minor variation in head length (Hibino *et al.*, 2015). Although Smith & Böhlke (1997) did not treat both populations of *G. minor* as different species, the two populations may be regarded as different species. It requires more detail examination including type specimens.

*Gymnothorax minor* recorded from the Gulf of

Thailand by Yoshida (2013) was a misidentification and it can be identified as *Gymnothorax annulatus* Smith & Böhlke, 1997 because of its distinct dark bands on body. Orsi (1974) recorded *G. reticularis* from Vietnam. The voucher specimen is still not confirmed, but it can be expected as a misidentification of *G. minor* or *G. annulatus* which distributes Philippines and the Gulf of Thailand.

**Comparative materials.** *Gymnothorax annulatus*: KAUM-I. 33163, 472 mm TL, Gulf of Thailand.

### Acknowledgments

We wish to express our gratitude to H. Motomura, K. Koeda, T. Yoshida, S. Tashiro and all other students of KAUM for their help during Y.H.'s visiting in the Kagoshima University. We thank to A. Tawa (National Research Institute of Far Seas Fisheries) for providing literature. This study was supported in part by Grant-in-Aid for Japan Society for the Promotion of Science for JSPS Fellows to Y.H. (PD: 15J02820), fund projects coded NDT.16 TW/16 and VAST 04.08/17-18, and the Asian Core Program and Core-to-Core program of the Japan Society for the Promotion of Science.

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(Received June 29, 2016; Accepted September 8, 2016)