

# New record of the cutthroat eel, *Meadia roseni* (Actinopterygii: Anguilliformes: Synaphobranchidae), from Vietnam

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## Abstract

A large individual of *Meadia roseni* Mok, Lee et Chang, 1991 is reported from central Vietnam for the first time, which also represents the first record outside the type locality, Taiwan. Herein we document the expansion of the distribution of this species, along with a detailed description and fresh color photos. The new finding may suggest that *M. roseni* has a broader distribution but somewhat restricted in the northern South China Sea.

## Keywords

biodiversity, fish fauna, ichthyology, new record, taxonomy

## Introduction

The genus *Meadia*, commonly referred to as arrow-tooth eels, is a small group of moderately slender fishes that comprises three nominal species. Böhlke (1951) described the genus to accommodate the abyssal cutthroat eel, *Dysomma abyssale* Kamohara, 1938, originally described from Japan. A second species, *Meadia roseni* Mok, Lee et Chang, 1991 from southern Taiwan was described subsequently. Recently, Vo et al. (2021) described the third species, *Meadia minor* Vo et Ho, 2021 from Vietnam, and discussed the identification of some closely related genera.

*Meadia roseni* was originally described based on a single specimen and later recorded by several authors (Ho et al. 2015a, 2015b). However, none of these records were from outside Taiwanese waters, even after many intensive

collecting activities in the past 20 years in nearby areas (Ho, personal observation). Recently, a large individual of *M. roseni* was collected by the first author from a local fishing port (Luong Sơn, Nha Trang) which represents the first record of the species outside Taiwan, as well as the first record of Vietnam. Herein, we provide a detailed description of the species based on the newly recorded specimen collected from Vietnam.

## Methods and materials

Total length (TL) and head length (HL) are used throughout. Methods for making measurements, counts, and terminology follow Böhlke (1989) and Vo et al. (2021). Specimens examined were deposited at the fish collection of the National Museum of Marine Biology and

Aquarium, Taiwan (NMMB-P). Comparative materials were listed in Vo et al. (2021), with additional specimens collected from Taiwan and examined by the first authors. The format for species description and data for comparison followed Vo et al. (2021).

## Results

### Family Synphobranchidae

#### Genus *Meadia* Böhlke, 1951

#### *Meadia roseni* Mok, Lee et Chan, 1991

Fig. 1

*Meadia roseni* Mok, Lee et Chan, 1991.—Mok et al. (1991): 39, figs.

1–3 (type locality: off Tongkang [Dong-gang], southwestern Taiwan, 22°21'05"N, 120°12'46"E, depth 1020 m).—Shen et al. (1993): 109 (Taiwan; short description). Smith (1999): 1661 (western central Pacific; list).—Randall and Lim (2000): 585 (South China Sea; list).—Ho and Shao (2011): 22 (Taiwan; type catalog).—Ho et al. (2015a): 8 (Taiwan; checklist).—Ho et al. (2015b): 179 (Taiwan; annotated checklist).—Vo et al. (2021): 187 (Taiwan; description).

**Specimen examined.** NMMB-P39330, 845 mm TL, Luong Son fishing port, ca. 12°20'6.7"N, 109°12'14.6"E, Nha Trang city, Vietnam, South China Sea, 13 January 2024, coll. H.-C. Ho.

**Description of NMMB-P39330.** Body rather robust, moderately slender, body depth at gill opening 13.1 times in TL; head and trunk slightly compressed, becoming more compressed on tail posteriorly. Body depth relatively uniform, narrowing gradually to caudal fin. Anal fin much higher than dorsal fin, about twice of depth; height of anal fin about 1/4 of body depth without fins, continuous with small caudal fin. Pectoral fin well developed, lower end of fin base at around upper end of gill opening; pectoral-fin length 25.0% (4.0 times in) HL. Head moderately long, rather robust, its length 15.5% (6.5 times in) TL; origin of dorsal fin slightly behind gill opening, above vertical through anterior 1/3 of pectoral fin, predorsal length 17.2% (5.8) TL; trunk short, 8.3% (12.1) TL; anus well anterior, about 1/2 head length behind pectoral-fin base; preanal length 23.8% (4.2) TL; tail very long, tail length 76.2% (1.3) TL. Head moderately slender, with bump in dorsal profile; snout blunt anteriorly and broad dorsally, densely covered with numerous papillae and flashy bumps; snout length 27.4% (3.6) HL; tip of snout projecting beyond lower jaw; eye moderately small, covered by thick and semitransparent membrane, its anterior margin above middle of upper jaw; eye diameter 7.7% (13.0) HL or 3.6 times in snout length; interorbital space very broad, flat or slightly concave, width 18.8% (5.3) HL; postorbital space broad. Anterior nostrils tubular, directed anteriorly; posterior nostril a small rounded pore with low rim and anterior flap, situated in front of eye, slightly higher than lower margin of eye. Lower jaw shorter than upper, its tip reaching first pore of

supraorbital series. End of mouth gape well behind eye, upper-jaw length 31.7% (3.2) HL. Gill opening large, semi-circular, its upper end right below lower end of pectoral-fin base. Head pores small. Head pores: SO 4 (including ethmoid), anterior 3 all restricted to anterior portion of snout, opening of first pore directed forward; AD 1; IO 6;5, 2 pores between nostrils, 2 below eye, 2 (1 on left side) behind eye; POM 10 (11 on left side), anterior 8 pores along lower jaw, two pores behind rictus, last pore (penultimate pore on left side) and 1 eye diameter behind rictus; ST 0; F 0. Lateral line almost complete, canal extending to about 1 eye diameter before caudal fin base; pores rather small along entire lateral line, rather small and indistinct on posterior end. Lateral-line pores: PPLL 9, PDLL 14, PALL 31, and total ca. 195. Tooth on jaw blunt to conical, somewhat granular, interspaces densely covered with numerous cirri making teeth not easily recognized; oval patch of moderately large teeth with about 13 small teeth along anterior and lateral margins on intermaxillary; followed by long patch of about 12 enlarged and stout teeth arranged in about 3 rows at middle, followed by small stout teeth posteriorly. Maxilla with long band of about 4–5 rows of slightly pointed teeth, those on outer row smallest, those on inner rows gradually larger innerly. Lower jaw with about 5–6 rows of stout teeth anteriorly, gradually becoming 4 rows posteriorly, those on outer row smallest, those on inner row gradually becoming larger innerly. Vertebrae: PDV 13, PAV 30, PCV 63, TV 197. Fin rays: 41 dorsal-fin rays before anal-fin origin; 430 total dorsal-fin rays; 394 total anal-fin rays.

**Coloration.** Body uniformly grayish brown to dark brown (Fig. 1A). Anterior 2/3 of dorsal fin grayish brown with broad pale margin, gradually becoming darker and the margins becoming narrower, darkened at about one head length from posterior end; anterior half of anal fin with narrow pale margin, becoming darker and the margins becoming narrower, darkened at about one head length from posterior end; caudal fin black. Peritoneum pale with fine black pepper dots, stomach and intestines pale.

## Discussion

The present reported specimen represents the first record of Vietnam, as well as the only record outside Taiwan. It may suggest that *Meadia roseni* has a broader distribution range. However, compared to other synphobranchids, *M. roseni* may have a more or less restricted range, mostly found in the northern part of the South China Sea. Although intensive samplings were made in the past decades, there are still many eel species new to the ichthyofauna of Vietnam (Vo et al. 2019, 2021, 2024; Vo and Ho 2020, 2021), which suggests a high eel diversity in Vietnam.

Compared to Vo et al. (2021), the Vietnamese specimen has a slightly longer head (15.5%, vs. 13.6%–14.3% TL), predorsal length (17.2%, vs. 15.4%–15.9% TL) and preanal length (23.8%, vs. 22.0%–23.5% TL). It also has



**Figure 1.** *Meadia roseni* Mok, Lee et Chang, 1991, off Nha Trang, Vietnam, fresh. (A) Lateral view. (B) Lateral view of head. A pin is inserted at origin of dorsal fin.

a slightly shorter snout (27.4%, vs. 28.0%–31.2% HL), smaller eye (7.7%, vs. 8.5%–9.8% HL) and broader interorbital space (18.8%, vs. 16.0%–17.0% HL). The arrangement of teeth is also slightly different. In general, there are more teeth compared to those from Taiwan. We examined a number of specimens from Taiwan and found that the number of teeth is lower in smaller specimens (<500 mm TL) and gradually becoming more in larger specimens, suggesting a growth change in the species reported in this study.

There are 2 infraorbital pores behind the eye on the right side of the Vietnamese specimen. We also found that there are 2 pores on the left side of one specimen (NMMB-P17799, 443 mm TL) and 2 on both sides of another specimen (NMMB-P17799, 520 mm TL) collected from Taiwan, which suggest some variation of head pores present in this species. In addition, we also counted 10–12 preopercular-mandibular pores in Taiwanese specimens, but mostly 10 or 11 in general.

**Comparative materials.** *Meadia roseni*: NMMB-P17799 (2 specimens, 443–520 mm TL), Dong-gang, Pingtung, southern Taiwan, 7 Sep. 2012. NMMB-P18092 (1, 495), Dong-gang, 7 Sep. 2012. NMMB-P24461 (1, 696), Dong-gang, 27 Jun. 2016. NMMB-P25976 (1, 435), Dong-gang, 21 Feb. 2017. NMMB-P26690 (1, 500), Dong-gang, 10 Jul. 2017. NMMB-P31634 (1, 475), Dong-gang, 29 Mar. 2017. Other specimens listed in Vo et al. (2021).

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