

ORIGINAL ARTICLE

New record of stargazer snake eel *Brachysomophis cirrocheilos* (Anguilliformes: Ophichthidae) from Vietnam

Quang Van VO^{*}, Nghi Quang BUI

Institute of Oceanography, Vietnam Academy of Science and Technology (VAST), No. 01 Cau Da, Nha Trang City, Khanh Hoa, Vietnam.

Correspondence
quanghdh@gmail.com

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Abstract

The results present the first record of the stargazer snake eel, *Brachysomophis cirrocheilos* (Bleeker, 1857) from Vietnamese waters. One specimen was fished by the bottom trap at 20-25m depth next to a reef in Nha Trang Bay, outside the Nha Phu estuary. The stargazer snake eel *B. cirrocheilos* is distinguished from congeners by a combination of characters: having a tail length greater than pre-anal length (head and trunk); dorsal fin origin well behind the pectoral fin tip; coloration overlain dorsally and along the flanks with irregular smudges; both upper and lower lips fringed with a series of small barbels (cirri); canine-like teeth on jaws and vomer; infraorbital pores 4+3. This paper provides data, a description, and photographs of the species and extends its distributional range to the east coast of Vietnam.

Keywords: Taxonomy, Ichthyology, Broadly distribution, Nha Trang Bay

INTRODUCTION

Family Ophichthidae (snake eel and worm eel) comprises 62 genera and 371 species in the world (Fricke et al. 2025), within this family, the snake eels genus *Brachysomophis* (subfamily Ophichthinae) includes seven recognized species in the world, include: *B. atlanticus* Blache & Saldanha, 1972; *B. cirrocheilos* (Bleeker, 1957); *B. crocodilinus* (Bennett, 1833); *B. henshawi* Jordan & Snyder, 1904; *B. longipinnis* McCosker & Randall, 2001; *B. porphyreus* (Temminck and Schlegel, 1846); and *B. umbonis* McCosker & Randall, 2001. The eels of this genus are characterized by their long jaws, toothy, fringe-like lips, and reptilian appearance (McCosker & Randall 2001).

In Vietnam, Family Ophichthidae (snake eel and worm eel) comprises 11 genera and 35 species. In the last 10 years, this family has had 4 newly described species, including *Ophichthus vietnamensis* Vo, Hibino & Ho, 2019; *Ophichthus longicarpus* Vo & Ho, 2021; *Ophichthus cuulongensis* Vo, Hibino & Ho, 2025; *Ophichthus nguyenorum* Vo, Hibino & Ho, 2025 (Vo et al. 2019; Vo & Ho 2021; Vo et al. 2025) and six new records, including *Ophichthus shaoi* McCosker & Ho, 2015; *Ophichthus singapurensis*

(Bleeker, 1864); *Skythrenchelys zabra* Castle & McCosker, 1999; *Ophichthus bicolor* McCosker & Ho, 2015; *Ophichthus machidai* McCosker, Ide & Endo, 2012; *Ophichthus obtusus* McCosker, Ide & Endo, 2012 (Hibino 2018; Vo et al. 2024), almost they are of genus *Ophichthus*. The genus *Brachysomophis* is currently documented by only one species, *B. crocodilinus* (Nguyen 2001; Le et al. 2013). Although *B. cirrocheilos* is known to be distributed in the Indo-West Pacific region (Biswas et al 2010), including the northern the South China Sea (Hong Kong and Taiwan) (Shen 1993; Ni & Kwok 1999). The first author collected an individual of *B. cirrocheilos* in Vietnam, where its morphology is compared with others, and an understanding of the species' geographic distribution is being mentioned in this article.

MATERIALS AND METHODS

The sample collected from local fishermen's catching in Nha Trang bay (ca. 12°18'28" N, 109°17'38" E) (Fig. 1), dead animal specimen relaxed were fixed in 10% formalin (in seawater) solution and later preserved in 70% ethanol for long-term preservation.

Measurements are straight-line, made either with

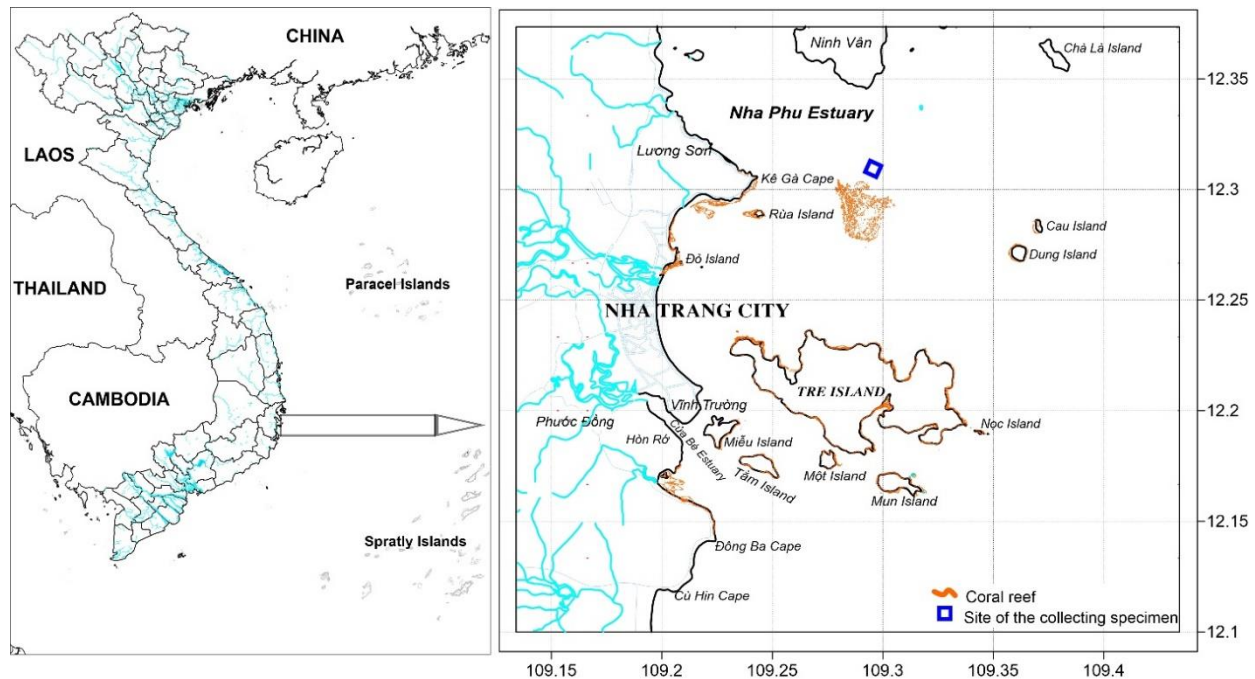


Fig.1. Map of the collecting localities of the studied materials, *Brachysomophis cirrocheilos*.

a 1000mm ruler with 0.5mm gradations (for total length (TL) and tail length recorded to the nearest 0.5mm, with a digital caliper for all other measurements and recorded to the nearest 0.1mm. Body length (pre-anal length) comprises head and trunk lengths. Head length is measured from the snout tip to the posterior margin of the gill opening; trunk length is taken from the end of the head to mid-anus; maximum body depth does not include the median fins (McCosker & Randall 2001). Head pore terminology follows that of McCosker et al. (1989) such that the supraorbital pores (SO); infraorbital pores (IO); preoperculo-mandibular pores (POM); supratemporal pores (ST); median frontal pores (F) in all specimens examined. Alcian blue was used to stain the skins of most specimens in order to make the precise counts of pores. Radiographs were made by a digital x-ray machine set up at the National Museum of Marine Biology & Aquarium, Taiwan, with pins inserted at origins of dorsal and anal fins. Vertebral counts were made from radiograph films or digital radiograph photographs follow Böhlke (1982).

The specimen is deposited at Institute of Oceanography, Nha Trang, Vietnam (OIM-E). Data used for comparison were either taken from specimens examined by the authors and various publications as

indicated (McCosker & Randall 2001; Biswas et al 2010).

RESULT AND DISCUSSION

RESULTS

Order Anguilliformes

Family Ophichthidae Günther, 1870

Genus *Brachysomophis* Kaup, 1856

Brachysomophis Kaup, 1856: 45 (type species, *Brachysomophis horridus* Kaup, 1856 = *Ophisurus crocodilinus* Bennett, 1833, by monotype). *Achirophichthys* Bleeker, 1864: 39 (type species, *Achirophichthys typus* Bleeker, 1864 = *Ophisurus crocodilinus* Bennett, 1833, by original designation).

Brachysomophis cirrocheilos (Bleeker, 1857)

English name: Stargazer snake eel

Vietnamese name: Cá chình rắn răng sấu vệt nâu

Synonyms: *Ophisurus cirrocheilos* Bleeker, 1857. – Bleeker (1857): 89 (type locality, Ambon, Indonesia; syntypes RMNH 7170 and BMNH 1867.11.28.213). Spelled *cirrocheilos* in text and *cirrhocheilos* in index, *cirrhocheilos* regarded as a misspelling.

Ophichthys cirrochilus (Bleeker, 1857). – Gunther (1870): 65, an emendation of *Ophisurus cirrocheilos* Bleeker, 1857.



Fig.2. *Brachysomophis cirrhocheilos* (Bleeker, 1857), OIM-E.55842, 963mm TL; a: fresh specimen of whole body, arrows point to the dorsal fin origin (DFO) and anal fin origin (AFO), respectively; b: close-up of head view from lateral side, arrow points to the DFO.

Brachysomophis cirrhocheilos (Bleeker, 1857). – Randall & Lim (eds.) (2000): 586.

Brachysomophis cirrhocheilus (Bleeker, 1857). – Tang & Zhang 2004: 21.

Material examined: OIM-E.55842, field code Q.00887, 963mm TL, near large submarine reef, ca. 12°20'32 "N, 109°17'37 "E, Nha Trang city, Khánh Hòa province, Viet Nam, 3 April 2021.

Description of OIM-E.55842: A moderately elongate species of *Brachysomophis* (Fig. 2 & Table 1) with tail length 1.8 and head length 8.7 in TL; body cylindrical for most of its length; its depth at gill openings equivalent to 26 times in TL; the dorsal fin origin well behind pectoral fin tips, a distance of 5.6 times in TL; the pectoral fins not elongate, moderately about 4.2 in HL; the snout moderate, about 3.6 in jaw; the eye diameter 5.4 in HL; the jaws elongate, about 2.5 in head, with the lower jaw extending beyond snout; the nostrils are situated in very short tubes in upper lip and closely associated; a well-developed labial fringe present, but cirri on jaws are not elongate, featuring cauliflower-like projections at tips; the centre of eye is anterior of the jaw; the interorbital space and the top of head are flat, with dorsal head profile nearly flat from mid-head to snout tip. The skin slightly wrinkled behind the nape and the body

exhibits longitudinal wrinkles, which are weak on abdomen. The head pores are inconspicuous, with SO 1 + 3, IO 4 + 3, POM 5 + 2; free sensory neuromasts not visible on nape. The teeth are conical, with the largest teeth located in the ethmoidal region of intermaxillary, followed by 6 smaller vomerine teeth; The maxillary teeth biserial, with an inner row of 11–12 slightly larger teeth and an outer row shorter in length with 10–11 teeth; the mandibular teeth are uniserial and widely-spaced with 11 on the right and 9 on the left respectively (Fig. 3). The vertebral formula was found to be 19/62/140.

Coloration in fresh: the dorsal side was pale brownish-yellow with irregular dark brown patches or smudges on back and sides. The ventral side was creamy white; the dorsal and anal fins were dark, pectoral fin dark.

Coloration in preservative alcohol condition: The body yellowish to brown, darker dorsally, overlain on body and trunk with dark brown patches forming incomplete and irregular patches or smudges along dorsolateral surface and extending to below the lateral line; snout, nape, cheeks, lower jaw and chin brown; fine black speckles on snout and nape; fins black; inside of mouth speckled; anterior nostrils pale.

Habitat: According to the concerned fishermen, this species was captured by the bottom trap from a large

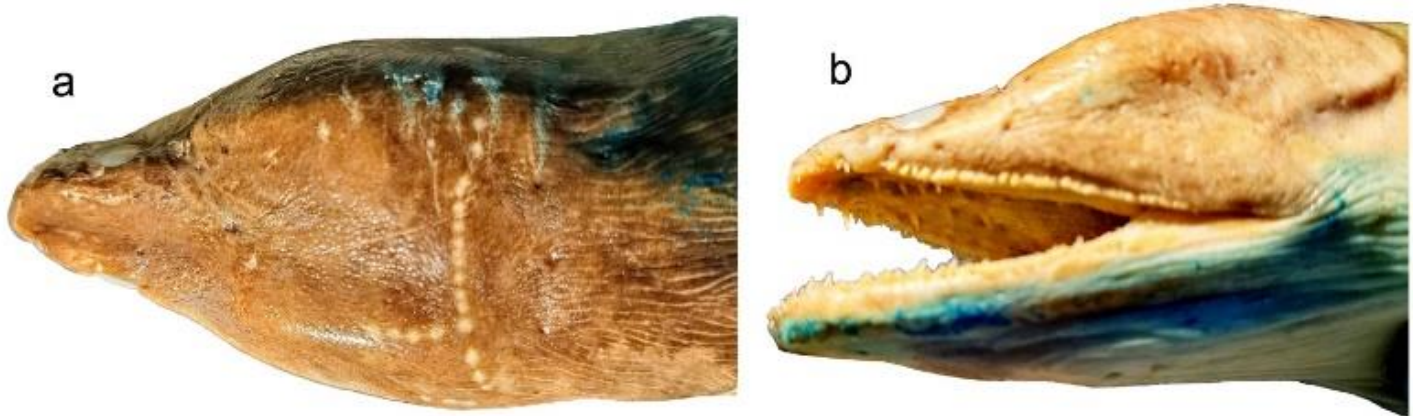


Fig.3. The anterior part of the head of *Brachysomophis cirrocheilos* (Bleeker, 1857), OIM-E.55842, 963mm TL, stained by cyanin blue after preservation for counted to the pores; a: interorbital space and top of head flat in dorsal view; b: teeth on jaws and vomer.

Table 1. Morphometric and meristic data of *Brachysomophis cirrocheilos*. ¹. This study; ². Biswas et al. (2010); ³. McCosker & Randall (2001)

	Viet Nam ¹	India ²	Indo – Pacific ³
TL (mm)	963	1020	320-1075
As % of TL			
Head length (HL)	11.4	12.5	10.9 – 13.3
Preanal length (head and trunk)	45.9	-	42.3 – 48.9
Pre-dorsal length	17.9	19.9	17.4 – 23.8
Tail length	54.1	51.5	51.1 – 57.7
Body depth at gill opening	3.8	-	2.9 – 5.1
Body depth at mid-anus	2.7	3.0	-
As % of HL			
Snout length	11.4	10.9	9.7 – 12.9
Eye diameter	5.4	5.5	3.4 – 6.3
Upper-jaw length	40.8	40.6	28.6-39.0
Pectoral-fin length	23.8	20.3	15.8 – 24.3
Counts			
SO	3+1	-	3+1
IO	4+3	-	4+3
POM	5+2	-	5+2
Pre-dorsal vertebrae	21	18	19 – 24
Preanal vertebrae	62	59	57 – 62
Total vertebrae	140	138	136 – 140

submarine reef, which located at the opening of the Nha Phu estuary in shallow water about 8 nautical miles from Nha Trang city at a depth of 20-25m on mud-sand bottoms.

DISCUSSION

The morphometric and meristic characters of the specimen found in Vietnam align well with descriptions by Smith & McCosker (1999), McCosker & Randall (2001) and Biswas et al. (2010). Compared

to McCosker & Randall (2001) (Figure 5B), the Vietnamese specimen exhibits slightly more teeth on the mandibular (9-11 vs. 6-7) and fewer teeth on the maxilla (10-11 vs. 12-13). *B. cirrocheilos* are dissimilar to the congeners in having a relatively long tail, its length 1.7-2.0 in TL, which is longer than in most other *Brachysomophis* species (excluding *B. porphyreus*); a pectoral fin moderately shorter than 25% of the head, a shorter snout (snout 7.8-10.3 in the head length); outer row of maxillary teeth not visible

when the mouth is closed, in contrast, some other *Brachysomophis* species have visible outer maxillary teeth, and a distinct color style; commonly, the dorsal surface is brownish-dark with irregular smudges and a lighter shadow under and resting on the fins; the dorsal and anal fins are completely dark. *B. cirrocheilos* is most closely related to *B. porphyreus* and has similar body proportions (long tail and slender body), a more even snout profile, moderately-developed pectoral fins, and similar dentition. It differs from *B. porphyreus* in its coloration, in having fewer vertebrae (136-140 vs. 145-148), a shorter snout (snout 3.8 in upper jaw vs. 3.2), and prominent labial cirri (either minute or absent in adult *B. porphyreus*). *B. cirrocheilos* distinguish with *B. crocodilinus* that might occur in Vietnam (including Indo-Pacific ocean), the last one having a tail length equal to or less than body length; coloration pale, darker dorsally, overlain with small spots, but not with irregular blotches or smudges, and fewer than total vertebrae (116-124 vs. 136-140).

The taxonomic status and specimens of this species have been mentioned by McCosker & Randall (2001), and they provided a distribution map for *B. cirrocheilos*, which is widespread in the Indo-Pacific area, ranging from the Red Sea and East Africa toward Pakistan, India, Sri Lanka, Malaysia, Indonesia, Australia, New Guinea, Taiwan, and Japan waters (Deraniyagala 1929; McCosker & Randall 2001, Biswas et al. 2010; Zohra & Osmany 2016). This eel is known to occur in shallow sandy and muddy substrata in coastal marine waters near coral reefs at depths of up to 38m. It usually burrows into the sand with leaving only its eyes and the top of its snout or head visible. It is nocturnal (McCosker & Randall 2001; Biswas et al. 2010). Previously, this species has been reported as a rare species from India (Biswas et al. 2010), but much more commonly encountered at night in Indonesia (McCosker & Randall 2001). There was no record of its occurrence in Vietnam waters. This survey provides the first

record and extends its known distribution to the East Sea (South China Sea). The lack of previous records in Vietnam waters could be attributed to the difficulty of sampling reef-associated species that are buried in the bottom or are rare.

CONCLUSION

The result confirms the presence of *B. cirrocheilos* in the waters of Vietnam. The morphometric and meristic characters of the specimen found in Vietnam agree well with descriptions by previous authors. This aligns with the species' established distribution across the Indo-West Pacific region, including Vietnam. This record contributes to the ongoing effort to document and understand the biodiversity of Vietnam's marine ecosystems.

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مقاله کامل

گزارش جدید مارماهی *Brachysomophis cirrocheilos* (Anguilliformes: Ophichthidae) از ویتنام

کانگ وان وو*، نگی کانگ بویی

موسسه اقیانوس‌شناسی، آکادمی علم و فناوری ویتنام (VAST)، شماره ۱، Cau Da، شهر Khanh Hoa، Nha Trang، ویتنام.

چکیده: نتایج اولین گزارش از مارماهی *Brachysomophis cirrocheilos* (Bleeker, 1857) را از آب‌های ویتنام ارائه می‌کند. یک نمونه توسط تله عمقی در عمق ۲۰-۲۵ متری در کنار صخره‌ای در خلیج Nha Trang، خارج از مصب Nha Phu صید شد. مارماهی *B. cirrocheilos* با ترکیبی از صفات از اعضای دیگر این جنس متمایز می‌شود: طول دم بیشتر از طول پیش‌باله مخرجی (سر و تنه)، منشاء باله پشتی پشت نوک باله سینه‌ای. رنگ در پشت و در امتداد پهلوها با لکه‌های نامنظم، هر دو لب بالا و پایین با یک سری سبیلک‌های کوچک (cirri) و دندان‌های نیش مانند روی فک‌ها و استخوان ومر و منافذ زیر چشمی ۳+۴. این مقاله داده‌ها، توضیحات و عکس‌هایی از گونه ارائه می‌کند و دامنه توزیع آن را به سواحل شرقی ویتنام گسترش می‌دهد.

کلمات کلیدی: آرایه‌شناسی، ماهی‌شناسی، توزیع گسترده، خلیج Nha Trang