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A new dwarf goby of genus *Eviota* (Teleostei: Gobiidae) from northern Taiwan

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Abstract

A new dwarf goby of genus *Eviota* was found and collected via SCUBA diving from northern Taiwan. The new species, *Eviota bifurca* **sp. nov.** can be well distinguished from other congeneric species by the unique combination of following features: (1) second dorsal fin I/8, anal fin I/8, pectoral fin 16; (2) longitudinal scale rows 24–25; (3) typical head canal pattern in lacking posterior oculoscapular canal and preopercular canal; (4) mouth large, extending to middle vertical of eye; and (5) specific coloration: body and head creamy white. Each scale pocket with golden yellow to yellowish brown margin. Ventral profile after anus with 5 major inner blackish brown blotches. Snout pointed with a bright orange stripe crossing to both lips. Two somewhat vertical orange lines below orbit. Totally trunk after first dorsal fin origin with 9 dorsal inner marks. First dorsal fin translucent with a basal forked brown mark. Basal region of first dorsal fin with three inner brown marks. Second dorsal fin translucent with 4–5 longitudinal rows of brown spots. Basal region of second dorsal fin also with three inner brown marks. Pectoral fin base with an upper orange round spot. Caudal fin base with a vertical brown bar. A brief morphological comparison with congeners will also be addressed.

Key words: *Eviota*, Gobiidae, marine fish, dwarf goby, fish taxonomy

Introduction

The gobioid fishes of the genus *Eviota* Jenkins, 1903, also known as dwarf gobies, are currently represented by over 110 valid described species, most of which inhabit coral-reef habitats throughout the Indo-Pacific region (Lachner & Karnella 1980; Greenfield & Suzuki 2011; Greenfield & Wintterbottom 2016). However, the true species diversity of *Eviota* from Taiwan remains unclear and far from our understanding.

In 2008, there were seven nominal species that had been documented and recorded in Taiwanese waters (Wu 2008). Furthermore, Greenfield and Jewett (2014) discovered a new species, which they named *Eviota aquila*, and documented the type locality merely from the Formosan Strait, Pingtung County, Taiwan. More recently, Shen *et al.* (2024) described a new species from the *Eviota zebra* species complex (defined by Tornabene *et al.* 2021), which may be endemic to Taiwan and nearby geographical regions.

The aim of this study is to firstly report a new species description for a very rare species of *Eviota* from Taiwanese waters. Brief morphological notes compared to congeners will also be provided in this paper.

Materials and methods

The dwarf goby was collected by hand-net while SCUBA diving around coral reef habitats. Fish samples were preserved in 10% seawater-based formalin and later transferred to 70% ethanol for long-term storage. Measurements

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were taken using digital calipers, following Miller (1988) and are expressed as percentage of standard length (SL) or head length (HL). Meristic counts generally follow Chen & Shao (1996) and Chen *et al.* (1999).

The terminology of the cephalic sensory canals and free neuromast organs (sensory papillae) follows Wongrat & Miller (1991), based on Sanzo (1911). Voucher specimens are deposited in the Pisces collections of National Taiwan Ocean University, Keelung (NTOUP). The following abbreviations are used herein: A = anal fin; C= caudal fin; D1 = first dorsal fin; D2 = second dorsal fin; P = pectoral fin; V = pelvic fin; LR= number of longitudinal scale rows; TR = number of transverse scale rows.

Systematics

***Eviota bifurca* sp. nov.**
(叉紋磯鰕虎)
(Figs. 1–2)

Material examined

Holotype—**NTOUP-2021-09-302**, 18.2 mm SL, Coll. I-S. Chen *et al.*, April 28, 2022, Longdong Bay, 20–25 m depth, New Taipei City, Taiwan, ROC.

Diagnosis

The species can be well distinguished from other congeners by the following combination of features: (1) second dorsal fin I/8, anal fin I/8, pectoral fin 16; (2) longitudinal scale rows 24–25; (3) typical head canal pattern in lacking posterior oculoscapular canal and preopercular canal; (4) mouth large, extending to middle vertical of eye; and (5) specific coloration: body and head creamy white. Each scale pocket with golden yellow to yellowish brown margin. Ventral profile after anus with 5 major inner blackish brown blotches. Snout pointed with a bright orange stripe crossing to both lips. Two somewhat vertical orange lines below orbit. Totally trunk after first dorsal fin origin with 9 dorsal inner marks. First dorsal fin translucent with a basal forked brown mark. Basal region of first dorsal fin with three inner brown marks. Second dorsal fin translucent with 4–5 longitudinal rows of brown spots. Basal region of second dorsal fin also with three inner brown marks. Pectoral fin base with an upper orange round spot. Caudal fin base with a vertical brown bar.

Description

Body very slender and rather compressed. Eye large and snout length about equal to orbit. Gill-opening restricted, extending just ventrally to anterior edge of opercle. Head as the triangular cross section. Interorbital region very narrow. Mouth large, maxillary extending to middle vertical of eye. Body morphometric proportions are listed in Table 1. Vertebral count 26.

Fins.—D1 VI, D2 I/8; P 16; A I/8; VI/5+I/5. First dorsal fin with anterior two rays slightly longer. First dorsal fin not extending beyond orgin of second dorsal fin. Rear of second dorsal fin tip far away from the vertical of caudal fin base.

No frenum, no connecting membrane between 2 pelvic fins.

Scales.—LR 24–25, TR 6, PreD 0. Body with rather large ctenoid scales. Predorsal region entirely naked. Head, opercle, and nape all naked.

Head lateral-line system. (Fig. 1)

Canals.—Anterior oculoscapular canal present, with anterior pore σ above posterior nostril. Single pore λ. Single pore κ. Rear of interorbital pore ω present. Lateral side with pore α, then extending to terminal pore ρ. Preopercular canal absent. Posterior oculoscapular canal absent.

Sensory papillae.—Row *a* rather short. Row *b* on rear of cheek. Row *os*, *oi* merely with two papillae for each. Row *ot* and *oi* well separate.

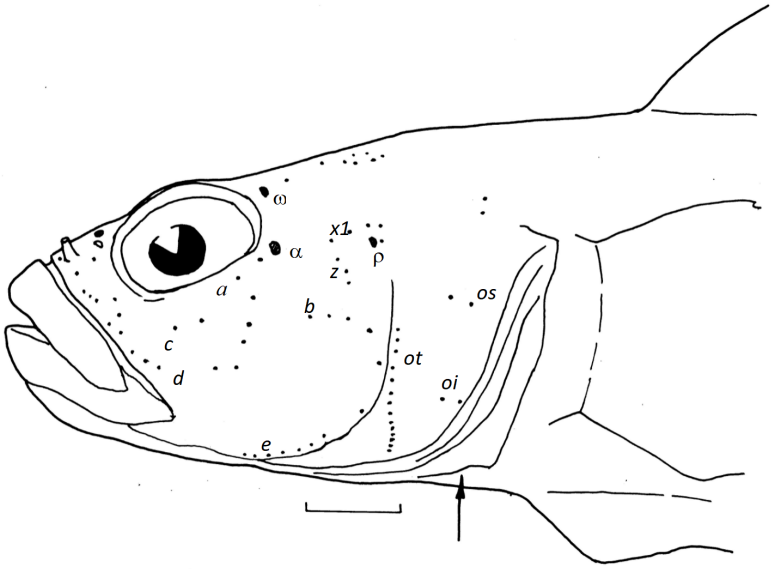

FIGURE 1. Head lateral-line system of *Eviota bifurca*, holotype, 18.2 mm SL, male, Longdong Bay, New Taipei City, Taiwan. Bar = 1 mm. The arrow indicates the vertical end of gill-opening.

TABLE 1. Morphometry of *Eviota bifurca* from Taiwan.

Type	Holotype
standard length (mm)	18.2
% in SL	
Head length	31.3
Predorsal length	39.3
Snout to 2nd dorsal fin origin	59
Snout to anal fin origin	58.3
Snout to anus	62.2
Prepelvic length	33.4
Caudal peduncle length	21.5
Caudal peduncle depth	13
First dorsal fin base	18.4
Second dorsal fin base	20.1
Anal fin base	19.2
Caudal fin length	25.5
Pectoral fin length	26.1
Pelvic fin length	28.9
Body depth of pelvic fin origin	22.6
Body depth of anal fin origin	18.9
Pelvic fin origin to anus	30.3
% in HL	
Snout length	21.1
Eye diameter	27.6
Postorbital length	54.4
Cheek depth	28.2
Lower jaw length	42.2
% in Caudal peduncle length	
Caudal peduncle depth	60.8

FIGURE 2. *Eviota bifurca*, holotype, 18.2 mm SL, male, Longdong Bay, New Taipei City, Taiwan.

Coloration while fresh

Body and head creamy white background. Each scale pocket with golden yellow to yellowish brown margin. Ventral profile after anus with 5 major inner blackish brown blotches. Snout pointed with a bright orange stripe crossing to both lips. Two major somewhat vertical orange lines below orbit. Cheek and opercle with many orange or brownish black small dots. Anterior nostril creamy white. Eye with 5 main radiating brown lines. Nape with irregularly brown bars. Totally trunk after first dorsal fin origin with 9 dorsal inner marks. First dorsal fin translucent with a basal forked brown mark and inside black dots. Basal region of first dorsal fin with three inner brown marks. Second dorsal fin translucent with 4–5 longitudinal rows of brown spots. Basal region of first dorsal fin with three inner brown marks. Pectoral fin base with an upper orange round spot. Basal region with 3 patches of orange marks. Anal fin translucent and unmarked. Caudal fin base with a vertical brown bar. Caudal fin membrane with 7 vertical rows of brown spots. Pelvic fin translucent and whitish.

Etymology

The species name *bifurca* is preferred to forked in Latin—"bifurcus" meaning the unique feature of "forked dark mark" on first dorsal fin.

Distribution

So far, the current new species only found from the coral-reef region of northern Taiwan—Longdong Bay, New Taipei City, Taiwan. It is possible to find the species in nearby countries of West Pacific.

Remarks

The current species rather differs to congeneric members due to lacking translucent body and quite unique coloration pattern. The forked brown mark on first dorsal fin is very specific feature for current new species. The triangular section of head is rather unique and unusual, which most members with typical compressed head shape. The species is very rare, more SCUBA diving exploration is very needed to realize the distribution pattern and also its own habitat preference.

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