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A new wriggler of Eleotrid (Teleostei: Xenisthmidae) from Taiping Island, South China Sea

CHIH-WEI CHANG[1,2,5*], KANG-NING SHEN[1,6#] & I-SHIUNG CHEN[3,4,7*]
[1]*Marine Ecology and Conservation Research Center, National Academy of Marine Research, Kaohsiung, 806614, Taiwan, R.O.C.*
[2]*National Museum of Marine Biology and Aquarium, Pingtung, 94450, Taiwan, R.O.C.*
[3]*Institute of Marine Biology, National Taiwan Ocean University, Keelung, 202301 Taiwan, R.O.C.*
[4]*Center of Excellence for the Oceans, National Taiwan Ocean University, Keelung, 202301 Taiwan, R.O.C.*
[5] *changcw@namr.gov.tw; https://orcid.org/0000-0002-0659-9582*
[6] *knshen@namr.gov.tw; https://orcid.org/0000-0002-6338-6049*
[7] *iscfish@gmail.com; https://orcid.org/0000-0002-4190-7720*
[#]*The author shares equal contribution of first author*
**Corresponding authors*

Abstract

A new wriggler of genus *Xenisthmus* was collected from Taiping Island, South China Sea, Taiwan, while SCUBA diving for a coral reef fish survey. The new species, *Xenisthmus aureus* **sp. nov.**, can be well distinguished from other congeners by the following unique combination of features: (1) fins: second dorsal fin rays I/11; anal fin rays I/10; pectoral fin rays15; (2) squamation: longitudinal scale series 60–62; perdorsal scales 0; (3) vertebral count 10+16=26; (4) preopercular canal present with 4 pores γ, δ, ε, and ε1; and (5) specific colouration: lateral side of trunk with an upper horizontal series of 20–22 yellow spots; a median series of oblique golden yellow stripes or becoming smaller, irregular golden yellow marks; the orange red cross mark on eye, radiating into mouth and posterior area horizontally, and extending up to top eye margin to downward vertically behind the maxillary on cheek; pectoral fin base with a upper, large oblique golden yellow mark; and caudal fin base with a very small median black spot. A species comparison of other congeners will also be briefly discussed in this paper.

Key words: *Xenisthmus*, new species, marine sleeper, South China Sea, Taiwan

Introduction

The genus *Xenisthmus* Snyder, 1908 comprises 12 nominal species in the Indo-Pacific before 2020: *Xenisthmus polyzonatus* (Klunzinger, 1871), *Hetereleotris clara* Jordan & Seale, 1906, *Xenisthmus proriger* Snyder, 1908, *Genimentum penicillum* Whitely, 1933, *Luzoneleotris nasubua* Heere, 1938, *Xenisthmus africanus* Smith, 1958, *Kramericus chapmani* Schultz in Schultz *et al.*, 1966, *Xenisthmus balius* Gill & Randall, 1994, *Xenisthmus chi* Gill & Hoese, 2004, *Xenisthmus erospilus* Gill & Hoese, 2004, *Xenisthmus semicintus* Gill & Hoese, 2004, and recently published, *Xenisthmus oligoporus* Gill *et al.*, 2017 (Gill & Hoese 2004; Gill *et al.* 2017).

Xenisthmus polyzonatus is the only recorded species of Xenisthmidae ever documented in Taiwanese waters (Shao 2022), which may be reconsidered as *Xenisthmus nasubua* (Herre, 1938) since a very comprehensive redescription of *Xenisthmus polyzonatus* was redefined by Gill *et al.* 2017. The fish is a benthic inshore species inhabiting the sandy fringe of coral reefs. Although the genus *Xenisthmus* is rather rare, a more intensive survey needs to be done to gather real species diversity for reviewing all members in Taiwanese waters. Some undescribed species are still slowly turned to light by our recent SCUBA diving fish collections of coastal, benthic gobioid fish fauna around Taiwan.

Among them are our marine gobioid fish collections, which have more than two undescribed species of the genus that still need to be surveyed (Chen & Chang unpublished data). More recently, one new species was just formally described as *Xenisthmus nigrolateralis* Chen *et al.*, 2022 from Taiwan.

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Around the South China Sea, the marine fish biodiversity expedition to Taiping Island, the southernmost island belonging to Taiwan, has been conducted from 2022 till present. More benthic fish fauna, including some unknown gobioid fishes, have been turned to light. The aim of this paper is to document the new discovery of a very unusual specimen with good preserved quality and then describe a new wriggler species of *Xenisthmus* from Taiping Island, South China Sea. A morphological comparison of related species of congeners with the current new species is also briefly addressed.

Materials & methods

Type specimen of the new wriggler was collected by using hand-net during SCUBA diving. All counts and measurements were made from fish specimens preserved in 70% ethanol.

Morphometric methods follow Miller (1988) and meristic methods follow Akihito *et al.* (1984), and Chen & Fang (2006). Terminology of the cephalic sensory canals and free neuromast organs (sensory papillae) is from Wongrat & Miller (1991), based on Sanzo (1911). Meristic abbreviations are as follows: A = anal fin; C = caudal fin; D1 = first dorsal fin; D2 = second dorsal fin; LR = longitudinal scale series; P = pelvic fin; PreD = predorsal scale series; SDP = scale series from origin of first dorsal fin to upper pectoral fin origin; TR = transverse scale series from second dorsal to anal fin; V = pelvic fin; VC = vertebral count. All fish lengths are expressed by standard length (SL).

The holotype of current new wriggler is deposited at Pisces collection of National Taiwan Ocean University, Keelung (NTOUP).

Taxonomy

***Xenisthmus aureus* sp. nov.**

(金狹塘鱧)

(Figures 1, 2)

Holotype. NTOUP-2024-04-151, 17.0 mm SL, April 24, 2024; coll. Y.C. Yang *et al.*, Taiping Island, South China Sea, Taiwan, ROC.

Dignosis

The new species can be well distinguished from other congeners by the following unique combination of features: (1) fins: second dorsal fin rays I/11; anal fin rays I/10; pectoral fin rays15; (2) squamation: longitudinal scale series 60–62; perdorsal scales 0; (3) vertebral count 10+16=26; (4) preopercular canal present with 4 pores γ, δ, ε, and ε1; and (5) specific colouration: lateral side of trunk with an upper horizontal series of 20–22 yellow spots; a median series of oblique golden yellow stripes or becoming smaller, irregular golden yellow marks; the orange red cross mark on eye, radiating into mouth and posterior area horizontally, and extending up to top eye margin to downward vertically behind the maxillary on cheek; pectoral fin base with a upper, large oblique golden yellow mark; and caudal fin base with a very small median black spot.

Description

Body very slender, subcylindrical anteriorly and somewhat compressed posteriorly. Anterior head somewhat depressed. All following body proportions are listed in Table 1. Head with very narrow interorbital region. Eye large. Lower jaw more prominent. Both anterior and posterior nostrils as short tubes which pointed to opposite direction on dorsal view. Both jaws with 5–6 rows of small, conical teeth which largest in outer rows. Gill-opening rather large, extending ventrally beyond the rear vertical of preopercle. Vertebral count 10+16 = 26.

Fins. D1 VI, D2 I/11; A I/10; P 15; V I/5. All D1 rays about equal without any filamentous ray. D2 rays low with rather long fin base. The rear tips of D2 rays when depressed extending to the procurrent rays of C. Origin of A inserted below middle vertical between first and second branched rays of D2. P moderate large and oblong, its rear tip not reaching vertical line through anus in male. V well separate, no frenum, connecting membrane. C elliptical, rear edge rounded.

TABLE 1. Morphometry of *Xenisthmus aureus* from Taiping Island, South China Sea.

Type status	Holotype
Size (mm SL)	17.0
% in SL	
Head length	23.6
Predorsal length	33.6
Snout to 2nd dorsal origin	53.0
Snout to anal fin origin	56.1
Prepelvic length	25.5
Caudal peduncle length	12.0
Caudal peduncle depth	11.2
First dorsal fin base	13.0
Second dorsal fin base	23.6
Anal fin base	31.4
Caudal fin length	21.5
Pectoral fin length	21.4
Body depth of anal fin origin	13.3
% in HL	
Snout length	24.7
Eye diameter	18.4
Postorbital length	54.6
Cheek depth	15.5
Lower jaw length	41.8
% in caudal peduncle length	
Caudal peduncle depth	93.9

Scales. Body mostly with rather small cycloid scales, predorsal area entirely naked. Upper part of operculum scaled. Cycloid scales present on pectoral-fin base. LR 60–62; TR 19; PreD 0. Prepelvic region naked.

Head lateral-line system. (Figure 1)

Canals: Nasal extension of anterior oculoscapular canal with terminal pore σ located in between anterior and posterior tube-like nostrils. Anterior interorbital sections of oculoscapular canal with paired pore λ. A single pore κ in near rear of interorbital region. Pore ω present behind orbit. Lateral section of oculoscapular canal with lateral pore α. Preopercular canal with rather more, 4 pores γ, δ, ε, and ε1.

Sensory papillae: Row *a* extending beyond vertical midline of orbit. Rows *c* short. A single *cp* papilla. Row *f* paired. Anterior edge of row *oi* well separated to lower region of row *ot*. Row *ot* interrupted with 2 sections

Coloration while fresh

Body and head semi-translucent with snow white to pale white background.

Lateral side of trunk after pectoral fin base with an upper horizontal series of 20–22 yellow spots, then with a median series of oblique golden yellow stripes or becoming smaller, irregular golden yellow marks. On dorsum with 4 yellow spots below first dorsal fin base and also 11 yellow spots beneath the second dorsal fin base. The orange red cross mark on eye, radiating into mouth and posterior area horizontally, and extending up to top eye margin to downward vertically behind the maxillary on cheek. Opercle with large orange blotch on upper part. Posterior region of interorbitals with three major orang blotches. Both lips pale white and anterior tip crossing with orange red bar radiating from orbit.

First dorsal fin translucent and spotless. Second dorsal fin translucent with a series of smaller yellow spots on middle area of fin membrane. Pectoral fin translucent and its base with a large oblique golden yellow mark

beneath in having tiny melanophores on upper region. Pelvic fin translucent and spotless. Anal fin translucent with a horizontal row of tiny basal yellow spots or bars. Caudal fin base with a very small median black spot, and its upper and anterior regions surrounding with the very thin orange curves. Caudal fin membrane translucent with about three vertical rows of yellow spots.

Colouration in preservative

Similar to live pattern, but the all brilliant, conspicuous orange, golden yellow, yellow marks or spots on body and all fins entirely faded. Some tiny darker melonophores or dots below the orange or yellow marks still present but less distinct.

Etymology

The specific name, *aureus*, is referred to the unique feature of its specific colouration pattern: golden-yellow (Latin: *aureus*) belly marks and also smaller golden yellow marks or short bars on lateral body among all remaining congeners.

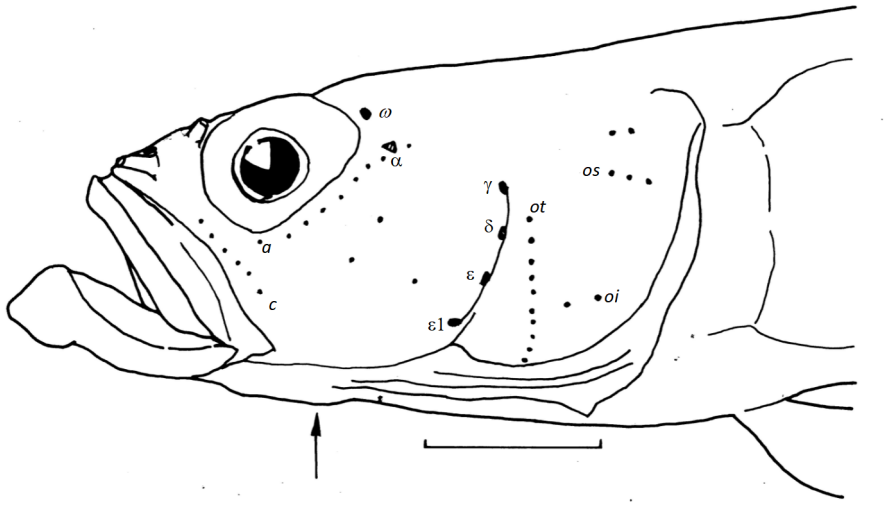

FIGURE 1. Head lateral-line system of *Xenisthmus aureus* **sp. nov.**, holotype, 17.0 mm SL, Taiping Island, South China Sea, Taiwan, R.O.C. Bar = 1 mm. The arrow indicates the vertical end of gill-opening.

FIGURE 2. *Xenisthmus aureus* **sp. nov.**, holotype, 17.0 mm SL, Taiping Island, South China Sea, Taiwan, R.O.C.

Distribution

So far, the new species merely can be found from the type locality—Taiping Island, South China Sea. It needs for fish biodiversity survey to nearby countries to realize the real distribution range.

Remarks

The new species, *Xenisthmus aureus*, is more similar to the Australian endemic species, *Xenisthmus chi* by overall preserved colouration than any other nominal congeneric species in the Indo-Pacific region. However, this new species can be well distinguished from the close related species by the following morphological features: (1) fin ray counts: second dorsal fin rays I/11 (vs I/12), anal fin rays I/10 (vs. I/11), pectoral fin rays 15 (vs. 17); (2) scale counts: longitudinal scale rows 60–62 (vs. 52–57); and (3) specific colouration: lateral side of trunk with an upper horizontal series of 20–22 yellow spots; a median series of oblique golden yellow stripes or becoming smaller, irregular golden yellow marks; the orange red cross mark on eye, radiating into mouth and posterior area horizontally, and extending up to top eye margin to downward vertically behind the maxillary on cheek; pectoral fin base with a upper, large oblique golden yellow mark; and caudal fin base with a very small median black spot (vs. 11 X-shaped markings along body sides). The rare new wriggler is still need to explore more in the near future not only morphological but also molecular phylogenetic aspect.

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References

Akihito, P., Hayashi, M. & Yoshino, T. (1984) Suborder Gobioidei. *In*: Masuda, H., Amaoka, K., Araga, C., Uyeno, C.T. & Yoshino, T., (Eds.), *The Fishes of Japanese Archipelago*. Tokai University Press, Tokyo, pp. 228–289.

Chen, I-S. & Fang, L.S. (2006) A new species of *Rhinogobius* (Teleostei: Gobiidae) from the Hanjiang basin, in Guangdong Province, China. *Ichthyological Research*, 53, 247–253. https://doi.org/10.1007/s10228-006-0342-6

Chen, I-S., Harefa, H., Jiang, G.C. & Chang, C.W. (2022) A new wriggler of Eleotrid (Teleostei: Xenisthmidae) from Taiwan. *Zootaxa*, 5189 (1), 13–17. https://doi.org/10.11646/zootaxa.5189.1.4

Gill, A.C. & Hoese, D.F. (2004) Three new Australian species of the fish genus *Xenisthmus* (Gobioidei: Xenisthmidae). *Records of the Australian Museum*, 56 (2), 241–246. https://doi.org/10.3853/j.0067-1975.56.2004.1428

Gill, A.C. & Randall, J.E. (1994) *Xenisthmus balius*, a new species of fish from the Persian Gulf (Gobioidei: Xenisthmidae). *Proceedings of the Biological Society of Washington*, 107 (3), 445–450.

Gill, A.C., Bogorodsky, S.V. & Mal, A.O. (2017) Review of Red Sea *Xenisthmus* Snyder (Teleostei: Gobioidei: Xenisthmidae), with description of a new species. *Zootaxa*, 4286 (2), 203–214. https://doi.org/10.11646/zootaxa.4286.2.4

Herre, A.W.C.T. (1938) *Luzoneleotris*, a new genus of eleotrid fishes from Luzon. *Stanford Ichthyological Bulletin*, 1 (2), 59–60.

Jordan, D.S. & Seale, A. (1906) The fishes of Samoa. Description of the species found in the archipelago, with a provisional check-list of the fishes of Oceania. *Bulletin of the Bureau of Fisheries*, 25 (1905), 173–455. https://doi.org/10.5962/bhl.title.46247

Klunzinger, C.B. (1871) Synopsis der Fische des Rothen Meeres. II. *Theil. Verhandlungen der K.-K. zoologisch-botanischen Gesellschaft in Wien,* 21, 441–688. https://doi.org/10.5962/bhl.title.1148

Miller, P.J. (1988) New species of *Coryrogobius*, *Thorogobius*, and *Wheelerigobius* from West Africa (Teleostei: Gobiidae). *Journal of Natural History*, 22, 1245–1262. https://doi.org/10.1080/00222938800770761

Sanzo, L. (1911) Distribuzione delle papille cutanee (organi ciatiforme) e suo valore sistematico nei gobi. *Mitteilungen aus der zoologischen Sation zu Neapel*, 20, 249–328.

Schultz, L.P., Woods, L.P. & Lachner, E.A. (1966) Fishes of the Marshall and Marianas islands. Vol. 3. Families from Kraemeriidae through Antennariidae. *Bulletin of the United States National Museum*, 202 (3), 1–176. https://doi.org/10.5479/si.03629236.202.3

Shao, K.T. (2022) The fish database of Taiwan. WWW Web electronic publication. Available from: http://fishdb.sinica.edu.tw (accessed 30 April 2022)

Smith, J.L.B. (1958) The fishes of the family Eleotridae in the western Indian Ocean. *Ichthyological Bulletin, Department of Ichthyology, Rhodes University*, 11, 137–163.

Snyder, J.O. (1908) Descriptions of eighteen new species and two new genera of fishes from Japan and the Riu Kiu Islands. *Proceedings of the United States National Museum*, 35 (1635), 93–111. https://doi.org/10.5479/si.00963801.1635.93

Whitley, G.P. (1933) Studies in ichthyology. No. 7. *Records of the Australian Museum*, 19, 60–112. https://doi.org/10.3853/j.0067-1975.19.1933.691

Wongrat, P. & Miller, P.J. (1991) The innervation of head neuromast rows in eleotridine gobies (Teleostei: Gobioidei). *Journal of Zoology*, 225, 27–42. https://doi.org/10.1111/j.1469-7998.1991.tb03799.x