

First record of *Periophthalmus walailakae* (Gobiidae: Oxudercinae) from Peninsular Malaysia

by

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RÉSUMÉ. - Premier signalement de *Periophthalmus walailakae* (Gobiidae: Oxudercinae) en Malaisie péninsulaire.

Periophthalmus walailakae Darumas & Tantichodok est signalé pour la première fois en cinq endroits le long des côtes occidentales de la Malaisie péninsulaire (Selangor, Johor) ; 22 spécimens collectés ont été comparés au matériel type. Ces résultats prolongent la distribution documentée de ces espèces à la grande partie de la côte occidentale de la péninsule de Malacca. Des notes morphologiques et écologiques et la présence des espèces associées et sympatriques sont également fournies.

Key words. - Gobiidae - Oxudercinae - *Periophthalmus walailakae* - ISW - Peninsular Malaysia - Sympatric species - First record.

Mudskippers (Gobiidae: Oxudercinae; Murdy, 1989) are a conspicuous component of tropical intertidal ecosystems. These fishes are abundant on tropical mudflats and mangrove forests from West-ern Africa in the Atlantic, to the entire Indo-Pacific region.

Periophthalmus Bloch & Schneider, 1801, with 17 species, is the richest genus (Murdy, 1989; Lee *et al.*, 1995; Murdy and Takita, 1999; Larson and Takita, 2004).

P. walailakae Darumas & Tantichodok, 2002 was described from the province of Ranong, Thailand. Jafaar *et al.* (2006) reported its presence in Singapore. Khaironizam and Norma-Rashid (2002) reported unidentified *Periophthalmus* specimens from Selangor, Malaysia. These specimens are here discriminated as *P. walailakae* and morphologically compared with other Malaysian specimens from Selangor and Johor, extending the actual documented distribution of this species in certain localities along the west coast of the Malacca Peninsula, from Thailand to Singapore (Fig. 2).

MATERIAL AND METHODS

Fishes were caught at low tide by hand nets. The live colour pattern was recorded in the field and in laboratory. Twenty-two fish were fixed in 10% formalin for morphological analyses, while three specimens (MSNG 54140 (2) and MSNG 54141 (1)) were fixed and preserved in 95% not denatured ethanol for future molecular analyses. A binocular microscope (15-60X) and a dial calliper were used to collect meristic and morphometric data. The number of teeth rows on the upper jaw was also examined (Murdy, 1989). Methods for counts and morphometrics follow Hubbs and Lagler (2004) and Murdy (1989) except for pectoral-fin length, which was measured as the straight-line distance from the dorsal attachment of the muscular pectoral-fin base to the tip of the fin rays. Two paratypes were also examined for comparison (PMBC 19550 and



Figure 1. - Live (A) and preserved (B) specimen of *Periophthalmus walailakae*. A: Male (109.5 mm SL, MSNG 51393); B: Female (107.5 mm SL, KMZ-NYR000722S (8)). Scale bar: 10 mm. Photographs by G. Polgar. [Spécimen vivant (A) et préservé (B) de *P. walailakae*. A : Mâle ; B : Femelle. Échelle : 10 mm.]

PMBC 19551). Specimens were deposited in the Zoological Museum of the Institute of Biological Sciences, Faculty of Science, University of Malaya, Kuala Lumpur (KMZ-NYR); and in the Museo Civico di Storia Naturale "Giacomo Doria", Genova, Italy (MSNG).

PERIOPHTHALMUS WALAILAKAE DARUMAS & TANTICHODOK, 2002

Material examined

One female, (paratype) (PMBC 19550), Thailand: Ao Phang-nga, Phang-nga; one male, (paratype) (PMBC 19551), *ibid.*; one male, (109.5 mm SL) (MSNG 51393), Malaysia: Selangor, Kuala Selangor, coll. G. Polgar, 8 Aug. 1996; 16 ex., (54.3-85.9 mm SL) (KMZ-NYR-M UMKL 5015), Malaysia: Selangor, Morib, coll. M.Z. Khaironizam, 12 Jan-14 Sep. 1999; 4 ex., (91.6-113.4 mm SL) (KMZ-NYR-S UMKL 5015), Malaysia: Selangor, Sementa, coll. M.Z. Khaironizam, 16 May-22 Jul. 2000; one ex., (74.1 mm SL) (KMZ-NYR-M UMKL 5015), Malaysia: Selangor, Morib, coll. M.Z. Khaironizam, same date as above; two ex., (41, 39 mm SL) (MSNG 54140), Malaysia: Johor, Pulau [=Island] Kukup, coll. G. Polgar, 12 Nov. 2006; one ex., (68 mm SL) (MSNG 54141), Malaysia: Johor, Tanjung [=Cape] Piai, coll. G. Polgar, 21 Oct. 2006.

Diagnosis

A species of *Periophthalmus* with the innermost pelvic fin rays joined by a basal membrane for their entire length: pelvic fins form a round disk. Strong pelvic frenum present. Series of dark brown speckles on caudal and pectoral-fin rays are present in live and preserved specimens. No sexual dimorphism of the dorsal fins. Length of anal-fin base % SL 15.0-18.4 (mean 17.0); length of second dor-

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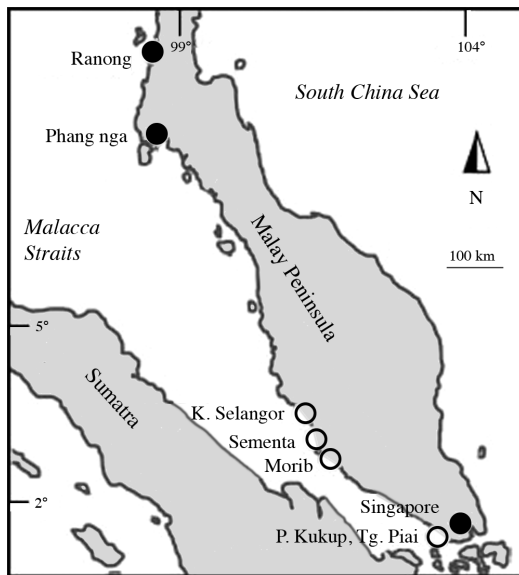


Figure 2. - Recorded distribution of *Periophthalmus walailakae*. ●: old records; ○: new record (this study). [Distribution enregistrée des *P. walailakae*. ●: signalements anciens; ○: nouveau signalement (présente étude).]

sal-fin base % SL 17.0-22.5, mean 19.0; head depth % SL 19.5-22.9, mean 21.1 (Tab. I).

Coloration pattern

Based on a photo of a live specimen (MSNG 51393: 109.5 mm SL, male; Fig. 1A), and on observations of other live and freshly dead specimens: background coloration brownish, with numerous, irregular white to pale yellow speckles on flanks, cheeks and throat, as large as or larger than the exposed field of the underlying scale. 4-7 diagonal, saddle-like, dorsal and irregular dark bars; irregular black blotches on cheeks. Belly white. First dorsal fin proximally dark brown and black for the distal third; margin white. Second dorsal fin with transparent background, medial dark brown stripe; reddish distal margin and 2-3 horizontal series of dark speckles on rays in some specimens. Anal fin white. Pectoral and caudal fin background greyish, with series of dark brown spots along rays. Pelvic fins ventrally white; dorsally rays pale brown.

In preservation (Fig. 1B), body coloration as in live specimens, but with less defined darker or paler speckles and blotches. Belly yellowish-grey. Fins as in live specimens, but with transparent margins. Anal and pelvic fins yellowish-grey. Ventral peritoneum dark brown.

Remarks

The diagnostic dorsal and anal fin counts (Darumas and Tanti-chodok, 2002; Larson and Takita, 2004) were not confirmed by this analysis and by inspection of paratypes (PMBC 19550 and PMBC 19551), which had counts of 1, 11 for both the anal and D2 fins, within the range of other congeneric species.

P. walailakae, *P. spilotos* Murdy and Takita, 1999 and *P. chrysospilos* Bleeker, 1852 are the only three *Periophthalmus* species with totally fused pelvic fins.

P. walailakae is the only one with series of dark speckles on caudal and pectoral fin rays. Few other characters show some differences (Tab. I; Murdy, 1989; Murdy and Takita, 1999).

Table I. - Ranges, means and standard deviations (sd) of selected morphometric and meristic data for the 22 *Periophthalmus walailakae* examined in this study. [Moyennes, intervalles et écarts types (sd) des données morphométriques et méristiques choisies pour les 22 *P. walailakae* examinés dans cette étude.]

	Mean	Range	sd
Standard length (mm)	65.8	45.8-109.5	18.6
Morphometrics (% of standard length)			
Body depth	15.8	14.6-17.3	0.8
Head length	29.3	27.7-30.3	0.7
Head depth	21.1	19.5-22.9	0.9
Length of first dorsal-fin base	13.8	11.0-18.3	1.8
Length of second dorsal-fin base	19.0	17.0-22.5	1.1
Length of anal-fin base	17.0	15.0-18.4	0.9
Length of pectoral-fin base	24.1	22.5-26.1	1.0
Length of pelvic fins	13.4	12.6-14.9	0.5
Least depth of caudal peduncle	9.4	8.9-10.5	0.4
Length of caudal fin	25.1	21.7-28.2	2.0
Meristic counts			
Pectoral-fin rays	15.0	15-16	0.2
Longitudinal scale count	68.3	66-72	1.7
First dorsal-fin elements	8.0	7-9	0.8
Second dorsal-fin total elements	12.0	12-13	0.2
Anal-fin total elements	12.0	11-13	0.3
Transverse scale counts (TRDB)	16.7	15-20	1.3

In *P. spilotos*, length of anal-fin base % SL: range 21.8-29.0 (mean 24.2); length of second dorsal-fin base % SL: 22.6-26.7 (24.4); and number of elements of the second dorsal fin: 14-15 (14.1); in *P. chrysospilos*, head depth % SL: 14.6-20.6 (17.6).

Distribution and ecological notes

All observations were made at low tide (Fig. 2). In Sementa (3°5'N; 101°21'E) and Kuala Selangor (3°21'N; 101°15'E), *P. walailakae* was found in mixed mangrove forests (high shore, Sasakumar, 1980): along small inlets, sympatric with subadults and juveniles of *Boleophthalmus boddarti* (Pallas, 1770), and *Periophthalmodon schlosseri* (Pallas, 1770); and in drier areas, up onto the landward fringe, in association with *P. novemradiatus* (Hamilton, 1822), *P. spilotos*, and *P. gracilis* Eggert, 1935. In the small mangrove formations of Morib (2°45'N; 101°26'E) it was found nearby tide pools, at the transition from the low to the high shore, together with *P. argentilineatus* Valenciennes, 1837 and *P. gracilis*. In Tanjung Piai (1°15'N; 103°30'E) few *P. walailakae* subadults were found on the seaward side of a high debris step that separates low and high shore, preventing the tide to enter the high forest. Sympatric species in these atypical conditions were adult and young *P. argentilineatus*, *P. chrysospilos*, and *Periophthalmodon schlosseri*; young *Boleophthalmus dussumieri* Valenciennes, 1837, and young *B. boddarti*; also few specimens of *P. gracilis* and *P. novemradiatus* were present. In Pulau Kukup (1°20'N; 103°25'E) young specimens were found in the low shore, in association with young *P. chrysospilos*.

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