

**FIRST RECORD OF THE MUDSKIPPER,
PERIOPHTHALMODON SEPTEMRADIATUS (HAMILTON)
(TELEOSTEI: GOBIIDAE) FROM PENINSULAR MALAYSIA**

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ABSTRACT. – *Periophthalmodon septemradiatus* (Hamilton) is recorded for the first time from Peninsular Malaysia, from the Selangor and Muar Rivers. Along the Selangor River, the mudskipper occurs on mud banks amongst the mangrove *Sonneratia caseolaris* and in the small tributaries of the river with *Nypa fruticans* and village orchard trees, in water that is largely fresh (1 – 3 ppt.). The morphological features of the mudskipper are described and compared with its congeners.

INTRODUCTION

Mudskippers are gobies that have become adapted to an amphibious lifestyle. They occur along the muddy shores of the intertidal areas in estuarine habitats and mangrove swamps of the Indo-Pacific region (Tytler & Vaughan, 1983). Murdy (1989) reported the presence of 10 genera including 34 species found worldwide and 8 species from 6 genera of them can be found in the Peninsular Malaysia.

The mudskipper genus *Periophthalmodon* Bleeker (family Gobiidae, subfamily Oxudercinae) is represented by three species: *Pn. schlosseri* (Pallas, 1770), *Pn. septemradiatus* (Hamilton) and *Pn. freycineti* (Valenciennes, 1837). Until now, only *Pn. schlosseri* was reported from Peninsular Malaysia (Cantor, 1849; Koumans, 1953; Macnae, 1968; Berry, 1972; Murdy, 1986, 1989; Takita et al., 1999).

Periophthalmodon septemradiatus was reported by Murdy (1989) from the Bay of Bengal eastwards to the Gulf of Thailand and Sarawak. Koumans (1953) reported the species from India, Andaman Island, Thailand, Sumatera, and Borneo. Takita et al. (1999) reported it from Tebing Tinggi Island, Sumatra, in a small stream under tidal influence. In this paper, *Pn. septemradiatus* is recorded for the first time in Peninsular Malaysia, from the Selangor and Muar Rivers that drain into the Straits of Malacca.

Specimens examined are deposited in the Institute of Biological Sciences, Faculty of Science, University of Malaya, Kuala Lumpur (KMZ-NYR). Additional materials from Peninsular Malaysia at the Zoological Reference Collection of the Raffles Museum of Biodiversity Research, Department of Biological Sciences, National University of Singapore (ZRC) were identified by Kelvin K. P. Lim (in

litt.). Terminology and measurements essentially follow Murdy (1989) and Murdy & Takita (1999).

TAXONOMY

***Periophthalmodon septemradiatus* (Hamilton)**

Material examined. – 20 ex., KMZ-NYR000306KK (2), Malaysia: Selangor, Selangor River at Kampung Kuantan, coll. M. Z. Khaironizam & Y. Norma-Rashid, 6 Mar. 2000; 10 ex., ZRC 41648, Malaysia: Johor, Muar, Muar River below Tanjung Selabu, coll. Y. Y. Goh, 8 Sep. 1997; 6 ex., ZRC 41172, Malaysia: Johor, Muar, Muar River at Jorak, coll. Y. Y. Goh, 18 Nov. 1996.

Diagnosis. – No pelvic frenum, pelvic fins completely separated. Snout scaleless, isthmus completely scaled. Scales on entire body large and cycloid. Teeth of upper jaw in two rows: anterior teeth of outer jaw small caninoid and smaller in the inner row. First dorsal fins (D1) in the female poorly developed possessing 3-5 short spines, and in some specimens are rudimentary. In the male, the first dorsal fin is of moderate height with a concave margin and an elongated first spine with 12 unbranched spines (Figure 2). Second dorsal fin (D2) with 12-14 spines (the first two unbranched). The first and second dorsal fins are contiguous. Pectoral and caudal fin spines are also branched. Table 1 shows the meristic and morphometric data of the specimens under KMZ-NYR000306KK (2).

Colour description. – Freshly dead specimens have dusky grey heads and, brown on dorsum, white on ventrum and numerous pale red and pale blue spots on snout, opercle and trunk. A dusky longitudinal stripe on the predorsum starts from eye and terminates under the end of D2 or just before

the D2 in certain specimens. Eight black, saddle-like blotches occur dorsally: first anterior to D1, second across base of D1, third between D1 and D2, fourth, fifth and sixth across base of D2, seventh between D2 and caudal fins and eighth anterior to caudal fin. Dorsal fins: D1 black with reddish margin and D2 dusky with a red margin. Caudal and pectoral fins greyish and numerous red and blue speckles on pectoral fins. Anal and pelvic fins dusky.

Preserved specimens are dark brown on body and white on ventrum. Black spots on body and the dusky stripe can only be seen in some specimens. The black blotches on dorsum also can be seen in preserved specimens. D1 black with a transparent margin, D2 dusky with dark brown stripes. Caudal, pectoral, anal and pelvic fin rays dusky.

Remarks. – Murdy (1989) recognised three species from the genus *Periophthalmus*. They are distributed from Ganges Delta eastward to Indonesia, Papua New Guinea and Australia, but only one species, *Pn. schlosseri*, was recorded from Peninsular Malaysia (Cantor, 1849; Koumans, 1953; Berry, 1972; Murdy, 1986, 1989; Takita et al., 1999).

The genus *Periophthalmus* is distinguished from *Periophthalmus* by having a black stripe coursing posteriorly from the eye to the caudal peduncle, and by having two rows instead of one row of teeth in the upper jaw. These characters differentiate *Pn. septemradiatus* from the similar looking *Periophthalmus weberi*, which is known only from Papua New Guinea and Australia (Murdy, 1989).

The separated pelvic fins of *Pn. septemradiatus* differentiate it from its congeners. *Pn. schlosseri* and *Pn. freycineti* have a strong frenum across their pelvic fins which are totally united to form a round disk. Unlike its congeners, *Pn. septemradiatus* is also sexually dimorphic. In mature males, the dorsal fins are contiguous, and the first dorsal fin is very reduced on females (Figure 2). In addition, adult *Pn. septemradiatus* is smaller (SL: about 40.0-60.0 mm) compared to *Pn. schlosseri* (SL: about 100.0-300.0 mm) and *Pn. freycineti* (SL: about 80.0-200.0 mm) (Murdy, 1989).

Periophthalmus septemradiatus was found utilising the habitat that is far from the sea. Although under tidal influence, the water there was almost fresh, with a salinity that ranged between 1 and 3 ppt. In contrast, *B. boddarti*, *Ps. chrysospilos* and most other mudskippers live in the littoral zone on the foreshore where the salinity ranges from 30-34 ppt. (Chew & Ip, 1990; Clayton, 1993).

Ecology. – The specimens of *Periophthalmus septemradiatus* examined by us were obtained from the banks of the Selangor River at Kampung Kuantan ($3^{\circ} 11'N$, $101^{\circ} 18'E$). This study area (Figure 1) is located about 15 km from the river mouth at Kuala Selangor, and about 64 km from northwest Kuala Lumpur. It was largely utilised for fishing, touristic and residential accommodation. A single species of mangrove, *Sonneratia caseolaris* was dominant. It formed a 10 metre wide belt above the mud banks, and ran parallel to the bund. Mature trees have brownish-grey bark and protruding pneumatophores that grow as high as

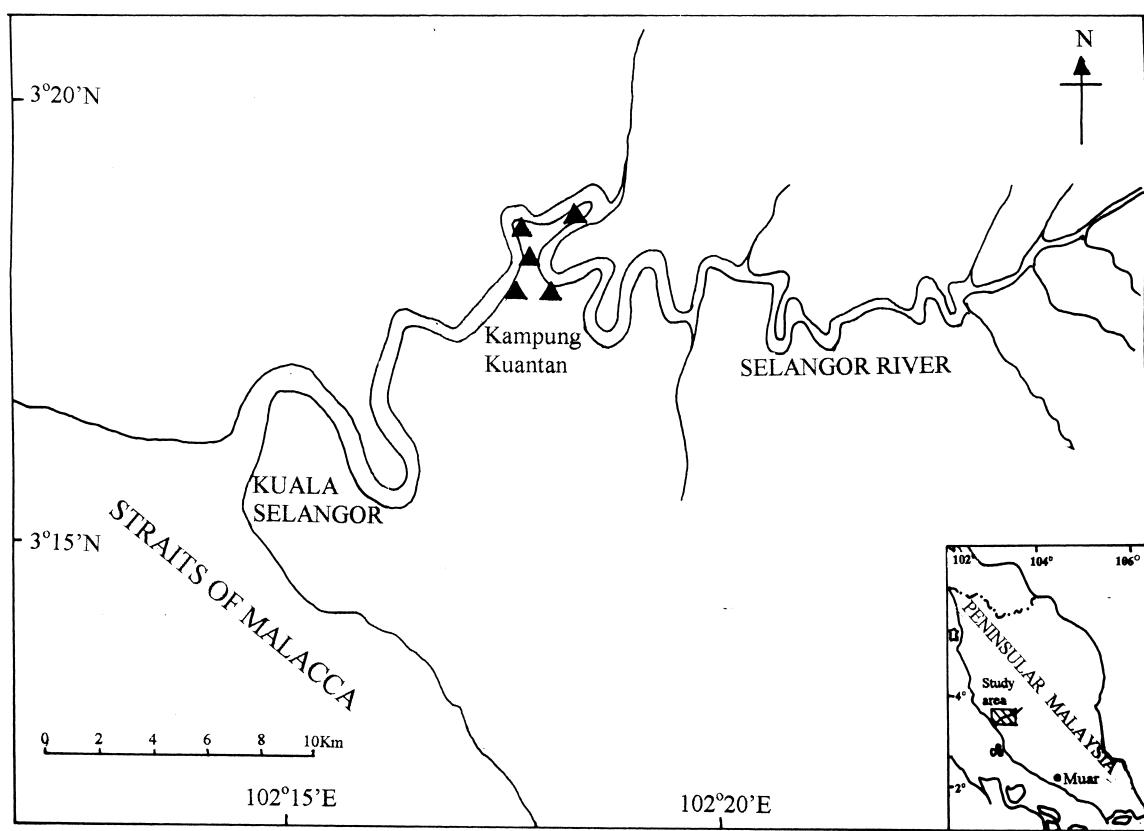


Fig. 1. Map of Selangor River at Kampung Kuantan, Selangor, showing known localities where *Periophthalmus septemradiatus* were collected (triangles). Inset: map of Peninsular Malaysia with an additional locality (round spot) in Johor.

Table 1. Meristic and morphometric data from 20 specimens of *Periophthalmus septemradiatus* KMZ-NYR000306KK (2).

Variable	Mean	Range
Total Length	64.52 mm	57.40-78.50 mm
Standard Length	55.46 mm	48.20-68.50 mm
First dorsal spines	8.50	5-12
Second dorsal elements	13.00	12-14
Anal fin elements	10.55	10-11
Pectoral fin elements	12.00	12
Longitudinal scales	48.60	48-50
Body depth	14.95 % SL	14.31-16.60 % SL
Head length	26.98 % SL	24.44-28.62 % SL
Head width	21.59 % SL	18.90-24.07 % SL
Head depth	19.76 % SL	19.09-20.95 % SL
Length of first dorsal base	8.74 % SL	2.36-18.64 % SL
Length of second dorsal base	21.92 % SL	21.29-30.22 % SL
Length of anal fin base	16.58 % SL	14.34-19.53 % SL
Length of pectoral fin base	24.88 % SL	23.32-27.22 % SL
Length of pelvic fin	14.89 % SL	13.70-15.82 % SL
Wet weight	3.13 g	2.10-6.90 g

10 to 15 cm. The mangrove forest was relatively open with slightly over 15 plants per 6 square metres. There were also some small tributaries draining through stands of *Nypa fruticans* and village orchard. The mud-banks were gradually sloping and the substrate was extremely soft with high water content. *Periophthalmus septemradiatus* was found on the mud banks and in the small tributaries along the upper reaches of the estuary. It was observed living sympatrically with the mudskippers *Periophthalmus novemradiatus* and *Ps. gracilis*. Along the upper reaches of the estuary at Kampung Kuantan, the water was fresh (0 ppt) at low tide. During extreme high tides, the salinities recorded in the river ranged from 1 to 3 ppt. Takita et al. (1999) found this species

in a small stream at Tebing Tinggi, Sumatra, in a place similar to the present study area, but they did not report on the water salinity or the presence of sympatric mudskipper species there.

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Fig. 2. Sexual dimorphism on *Periophthalmus septemradiatus* [KMZ-NYR000306KK (2)]. a) Male: the first dorsal fin is of moderate height with an elongated spine and contiguous with the second dorsal fins. b) Female: the first dorsal fin is poorly developed and not contiguous with the second dorsal fins.

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