

SHORT COMMUNICATION

FIRST SURVEY OF INLAND FISHES (TELEOSTEI: PERCIFORMES) FROM PULAU SIBU, JOHOR, PENINSULAR MALAYSIA

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Abstract: Inland fishes of Pulau Sibul, Johor are reported for the first time with the record of three species namely *Periophthalmus variabilis*, *Pseudogobius melanostictus* and *Ophiocara porocephala*. The three species, all of which were marine associated species were found in the remnant water bodies close to the sea. Poor species richness could be related to the scarcity of the permanent inland water on the island.

Keywords: First record, diversity, inland fishes, Pulau Sibul, Malaysia

Introduction

Seribuat Archipelago is located off the east coast of Peninsular Malaysia and consists of approximately 32 islands. Other than the Pulau Tioman, the information of inland fishes on the islands of Seribuat Archipelago is currently absent. In Pulau Tioman, four studies had been conducted which started from 1966 until its latest in 2015, in which a total of 62 species of inland fishes were recorded (Alfred, 1966; Lim, 1993; Ng *et al.*, 1999; Tan *et al.*, 2015). These researches had shown that the islands' water bodies which ranging from small freshwater streams to mangrove creeks and river mouths, harbored a highly diverse inland fishes particularly of the secondary freshwater species.

Pulau Sibul is one of the southernmost islands in Seribuat Archipelago, located at about 12 km off Mersing district of Johor, east coast of Peninsular Malaysia (Figure 1). Pulau Sibul is a 6 km long and a width of 1 km island, is blessed with lowland forest on both ends and mangrove swamps thrives in the central part of the island (Wood *et al.*, 2004). The inventory of inland fishes of Pulau Sibul was conducted during the Pulau Sibul Scientific Expedition 2017, it was a jointly organized by the Institute of Tropical Biodiversity and Sustainable Development (ITBSD, formerly known as Kenyir Research

Institute), Universiti Malaysia Terengganu (UMT) and the Department of Marine Parks Malaysia. This inventory is the first to be done with the primary aim to document the inland fishes of Pulau Sibul.

Materials and methods

The expedition was conducted during a dry weather condition. Under the parch weather, the state of the upper streams were mostly dried up leaving only empty channels and barren stream beds. Thus, the fish inventory was restricted only to the lower part of the drainages where pockets of water were available. Fishes were sampled during the Pulau Sibul Scientific Expedition which commenced from 21st to 24th July 2017. Fishes were caught using scoop nets in the water bodies found on the island (Figures 1, 2 and 3). At night, torchlights were used to locate the fish in the water and they were caught with similar method. The collected fishes were then photographed, they were preserved in a 10% formalin solution and later were transferred into a 75% ethanol and the samples were all deposited to Universiti Malaysia Terengganu Zoological Collection at UMT. Fish identification were based on Kottelat *et al.* (1993) and nomenclature according to Kottelat (2013).

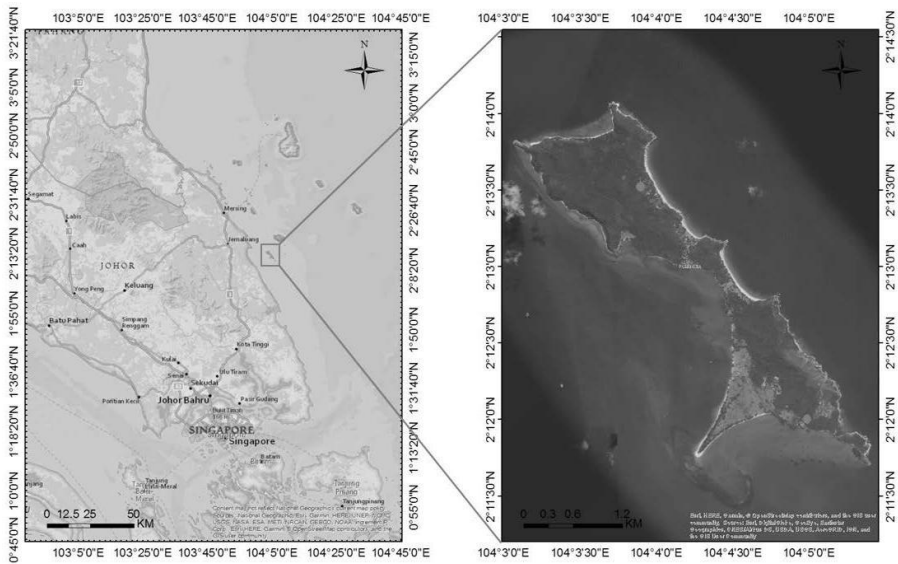


Figure 1: Map of the southern part of Peninsular Malaysia showing the state of Johor where Pulau Sibul is located (rectangle) (left). An overview of Pulau Sibul showing the location of the study areas (right).



Figure 2: The freshwater canal found at Kampung Duku, Pulau Sibul that were surveyed in this study.



Figure 3: The isolated pool showing the remnant water body of Sungai Musuh, Pulau Sibul.

Results

In this survey, there were only three species from two families of fishes were recorded for the first

time from the small creeks on Pulau Sibul. They were *Periophthalmus variabilis*, *Pseudogobius melanostictus* and *Ophiocara porocephala*.

Systematic account

Class ACTINOPTERYGII

Order PERCIFORMES

Family GOBIIDAE

Periophthalmus variabilis Eggert, 1935

Dusky-gilled mudskipper



Figure 4: *Periophthalmus variabilis* Eggert, 1935 (SL 30 mm) found at Sungai Dusun, Pulau Sibul, Johor (Photo by: M. Aqmal-Naser)

Synonym(s).*Periophthalmus novemradiatus* (Hamilton, 1822)*Periophthalmus variabilis asiaticus* Eggert, 1935*Periophthalmus variabilis sumatranus* Eggert, 1935*Periophthalmus variabilis tidemani* Eggert, 1935*Periophthalmus variabilis variabilis* Eggert, 1935

Material examined: A specimen from Sungai Dusun, Pulau Sibul, Johor; 21st April 2017; 1 ex.; SL 30 mm; collected by M. Fahmi-Ahmad.

Diagnostic characters: Jaafar *et al.* (2009) that, this species has a rounded first dorsal fin with moderate height, white margin and one black or brown black stripe inframarginally. The first

spine of first dorsal fin are rarely elongated and always the longest, with elliptical or rounded red-orange spots at ventral to inframarginal stripe, turning black in preservative. The fish pectorals and caudal fins are red-orange in colour when alive. Both sexes have similar appearances.

Habitat: Inhabits estuaries and mangroves.

Enter small creek during high tide.

Distribution: Western Pacific: Thailand, Malaysia, Singapore and Indonesia.

Remarks: First report from Sibul Island.

Class ACTINOPTERYGII
 Order PERCIFORMES
 Family GOBIIDAE
Pseudogobius melanostictus (Day, 1876)
 Black Spotted Fat-nose Goby



Figure 5: *Pseudogobius melanostictus* (Day, 1876) (SL 18 mm) collected from freshwater canal in Kampung Duku, Pulau Sibul, Johor (Photo by: M. Aqmal-Naser)

Synonym(s).

Gobius melanosticta Day, 1876
Vaimosa serangoonensis Herre, 1937
Stigmatogobius poicilosoma Koumans, 1953
Stigmatogobius poicilostoma Gomez, 1980
Pseudogobius javanicus Lim & Larson, 1994
Pseudogobius melanostictus Larson & Lim, 2005

Material examined: Specimens from freshwater canal in Kampung Duku, Pulau Sibul, Johor; 22nd April 2017; 10 ex.; SL 10 - 25 mm; collected by M. Fahmi-Ahmad and M. Aqmal-Naser.

Diagnostic characters: Possess blotches on caudal fin base and 14 – 15 pectoral fin rays (Larson & Lim, 2005). Other species from the genus namely *Pseudogobius avicennia* has 15 – 16 pectoral fin rays while *Pseudogobius javanicus* has 14 – 16 pectoral fin rays (Yokoo et

al., 2008). The species taxonomic keys are still being revised (Larson et al., 2008).

Habitat: The species was found in both brackish and fresh water bodies either in sandy or muddy bottom. Amphidromous species; migrate from freshwater to salt water or vice versa at certain life cycle other than its breeding season (McDowall, 1997).

Distribution: Indo-West Pacific. Also reported in Southern Thailand, Creek at Serangoon, Singapore (Larson et al., 2008) and eastern Johor Strait (Ng et al., 2015).

Remarks: First report from Sibul Island. The most abundant fish species in water bodies of Pulau Sibul.

Class ACTINOPTERYGII
Order PERCIFORMES
Family ELEOTRIDAE
Ophiocara porocephala (Valenciennes, 1837)
Spangled Gudgeon/Northern Mud Gudgeon



Figure 6: *Ophiocara porocephala* (Valenciennes, 1837) (SL 85 mm) from a small creek near the shore at Kampung Duku, Pulau Sibul, Johor. (Photo by: M. Aqmal-Naser)

Synonym(s).

Ophiocara ophicephalus Valenciennes, 1837
Eleotris madagascariensis Valenciennes, 1837
Eleotris ophiocephalus Valenciennes, 1837
Eleotris porocephala Valenciennes, 1837
Eleotris viridis Bleeker, 1849
Eleotris kuak Montrouzier, 1857
Eleotris scintillans Blyth, 1860
Eleotris cantoris Günther, 1861
Eleotris litoralis Day, 1876

Material examined: A specimen from a small creek near the shore at Kampung Duku, Pulau Sibul, Johor; 22nd April 2017; 1 ex.; SL 85 mm; collected by M. Aqmal-Naser.

Diagnostic characters: Elongated body of somewhat compressed anteriorly with oblique

mouth. Teeth are set in villiform bands. Hoese (1986) stated that this species has dark head and dark body; second dorsal and caudal fins are spotted; juveniles with irregular crossbars. Other details characters of this species are provided in Akihito and Megura (1974).

Habitat: Adult usually inhabits brackish estuaries, freshwater creeks and estuaries (Allen *et al.*, 2002). Amphidromous species (Donaldson *et al.*, 2002).

Distribution: Indo-West Pacific: East Africa to Phillipines, north to Ryukyu Island (Masuda *et al.*, 1984).

Remarks: First report from Sibul Island.

Discussion

The inland fishes of Pulau Sibul had never been documented before. This paper reported for the first time three species, namely, *Periophthalmus variabilis*, *Pseudogobius melanostictus* and *Ophiocara porocephala* all of which were marine associated species, they were found in the remnant water bodies close to the sea on Pulau Sibul. The survey was unfortunately unable to record any other species that live in the remnant water bodies on the island. Except for Pulau Sibul, several other islands in Peninsular Malaysia which its inland fishes had been documented were Pulau Tioman (Lim, 1993; Ng *et al.*, 1999; Tan *et al.*, 2015) and Pulau Langkawi (Ahmad and Lim, 2006; Azmir and Samat, 2010; Samat *et al.*, 2012). All of the fish species reported in this study had been observed on the larger island of Pulau Tioman. Being a small island and the scarcity of permanent freshwater bodies compared to a larger island like Pulau Tioman, fish diversity on Pulau Sibul was expected to be lesser. Furthermore, water abstraction for domestic consumption had contributed to the drying of the small stream especially during the dry season. Henceforth, such situation has reduced the freshwater biodiversity (Xenopoulos *et al.*, 2005).

The smaller mangrove patches and drainages with limited water were not helpful to sustain a rich fish diversity. It is known that aquatic species richness increases as the water availability increases (Poff *et al.*, 2001). As a result, the harsh condition contributes to the diminished composition, diversity and fish recruitment (Lake, 2003) in Pulau Sibul. The ephemeral condition of the river in Pulau Sibul also had been reported to occur in the small sized island of the Hawaiian Archipelago, as a result of inconsistent rainfall and small river catchment, forcing fishes to colonize only the water bodies intermittently (McDowall, 2003). However, as the habitat becomes more habitable, especially during the wet seasons, the fishes will be re-colonized mostly by the widespread amphidromous species, which is one of the attributes of fishes in remote island (McDowall,

2004). This report is none other than to provide a basic information of inland fishes of Pulau Sibul. A further survey should be carried out during the wet seasons to further investigate and understand the true diversity of ichthyofauna of Pulau Sibul.

Conclusion

Despite only three species of inland fishes were recorded in Pulau Sibul during this survey, the results are yet to be conclusive. These findings should not be dismally accepted but should act as an aid of encouragement to further explore the ichthyodiversity of Pulau Sibul, thus to better understand its aquatic species richness.

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