

First report of two gobiid fishes from the coral reefs of Gulf of Mannar, Tamil Nadu, India

Chemmencheri Ramakrishnan Sreeraj

Zoological Survey of India, Sunderban Regional Centre, Canning, Kolkata – 743329, West Bengal, India; Email: crsreeraj@gmail.com

Abstract

The Gulf of Mannar Marine National Park encompasses 21 islands between Rameshwaram and Thoothukudi. The islands with its unique ecological systems mainly contributed by coral reefs, sea grass beds and mangroves harbour a rich marine biodiversity. Previous literature revealed, so far 1182 species of fishes have been reported from the Gulf of Mannar region. A survey in the Mandapam group of Islands in the Gulf of Mannar has resulted occurrence of two gobiid fishes viz., *Istigobius ornatus* (Rüppell, 1830) and *Silhouettea indica* Visweswara Rao, 1971. This is the first report of *S. indica* outside Godavari delta region.

Keywords: Gobiidae, *Istigobius*, Range Extension, *Silhouettea*

Introduction

Gulf of Mannar (GoM) is well known due to its unique ecological systems and richest marine biodiversity regions, mainly contributed by coral reefs, sea grass beds and mangroves comprising of several finfish and shellfish species. The GoM was declared as Marine National Park in 1986 for the purpose of protecting marine life and its environment (Kumaraguru, 2006). The area is under the Man and Biosphere programme of UNESCO and designated as Gulf of Mannar Biosphere Reserve (GoMBR) in the year 2001. The GoM marine national park encompasses 21 islands between Rameshwaram and Thoothukudi (08° 47'N 78° 12'E and 09° 15'N 79° 14'E). The GoM with its islands provides a very interesting heterogeneous group of fauna and flora with about 3,600 species (Ramadhas *et al.*, 1999).

Reef fishes are the most diverse elements in the reef fauna and because of their wider ecological significance. Some families of reef fish, present valuable groups for monitoring the health of reefs and for investigating factors underlying the high species diversity characteristics of reef ecosystems. First attempt to document the ichthyofaunal of GOM, resulted in cataloguing of 300 fish species (Murty, 1969). The marine and estuarine fishes of Tamil Nadu estimated during 2011 were 859 species (Barman

et al., 2011). The recent attempt to make a checklist of fishes revealed the presence of 1,182 fish species belonging to 476 genera, 144 families and 39 orders from Gulf of Mannar (Joshi *et al.*, 2016). The current work reports the occurrence of two species of Gobiid fish's viz., *Istigobius ornatus* (Rüppell, 1830) and *Silhouettea indica* Visweswara Rao, 1971 for the first time from the Gulf of Mannar Marine National Park, Tamil Nadu.

Materials and Methods

A survey was carried out in the coral reefs of Mandapam group of Islands in the Gulf of Mannar Marine National Park in January 2020 as part of the in-house project. Fishes were recorded from the shallow water coral reefs by snorkelling and collected using aquarium fish net from the Pullivasal Island (9°14'55.01"N; 79°11'3.25"E), Gulf of Mannar Marine National Park, Tamil Nadu, India (Figure 1). The fishes were collected in plastic tubes and transferred to the boat. The collected fishes were placed in glass trays and photographed. The collected fishes were fixed in 10% formalin in seawater solution and later preserved in 70% ethanol. Fishes were identified based on Fish base (<https://www.fishbase.in/>) and Padmavathi (2017). All length measurements were taken to nearest 0.1 mm using electronic vernier callipers (TL-Total

* Author for correspondence

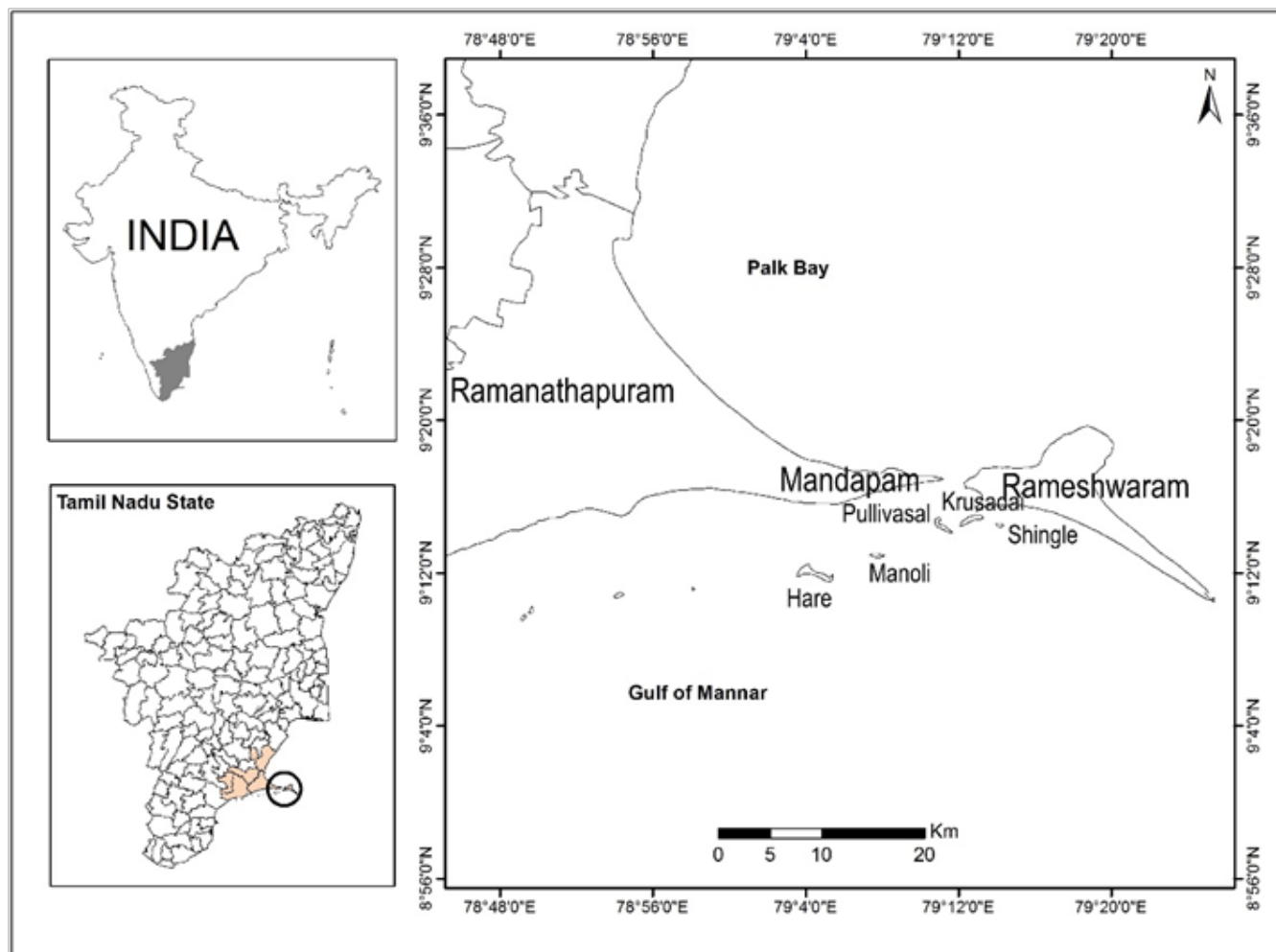


Figure 1. Map of the Mandapam group of Islands in GoM showing the collection sites.

Length, SL-Standard Length, BD-Body Depth, HL-Head Length). The specimens are deposited in the National Zoological Collections of the Sunderban Regional Centre of Zoological Survey of India.

Results

The details of the identified species are given below:

Taxonomic Account

Class ACTINOPTERYGII (Klein, 1885)

Order PERCIFORMES (Bleeker, 1863)

Family GOBIIDAE Cuvier, 1816

Sub-Family GOBIINAE Cuvier, 1816

Genus *Istigobius* Whitley, 1932

Istigobius ornatus (Rüppell, 1830)

Common name - Ornate goby

Material examined: ZSI/SbRC/KN 3090, 1 ex, (TL 26.7 mm, SL 22.5 mm, BD 4.6 mm, HL 6.5 mm), Pullivasal Island, Gulf of Mannar Marine National Park (9°14'55.01"N; 79°11'3.25"E), 24.01.2020, Coll: Sreeraj, C.R.

Diagnostic characters: *Istigobius ornatus* is diagnosed from congeners in having a combination of the following characters -First dorsal VI; Second dorsal I, 10; Anal I, 9; Pectoral rays 19. Upper 4 pectoral rays free. Predorsal scales 10, cycloid. Longitudinal scale series 31, ctenoid. No scales on cheek or opercle. Small fish with slender and compressed body. Dorso-laterally situated eyes. Mouth with overhanging snout, lips greatly thickened. Pale grey body colour with few (6-8) brownish dots forming a blotch like appearance on the operculum. First dorsal fin with yellow colour on top and brown in the middle region (colour prominent on the spines) and pale bottom.



Figure 2. *Istigobius ornatus* (Rüppell, 1830).

Scattered white speckles over the dorsal fins, numerous brownish-black streaks arranged in horizontal rows on side (Figure 2).

Distribution: India: Andaman and Nicobar Islands, West Bengal, Andhra Pradesh, Kerala (Rajan *et al.*, 2013; Mishra *et al.*, 2019; Koumans, 1941) and GoM (Current Study). *Elsewhere:* Indo-Pacific: Red Sea South to Northern Mozambique and east to Fiji, north to southern Taiwan, south to New Caledonia and Tonga (Froese & Pauly, 2019).

Remarks: Found solitary in the shallow (less than 1m depth) silty coral reef area. As the species was found in this kind of area, live base colouration of body is light brownish and for that reason the pattern on the body is more prominent making this species well camouflaged in the environment.

Genus *Silhouettea* Smith, 1959

Silhouettea indica (Visweswara Rao, 1971)

Common name - Indian silhouette goby

Material examined: ZSI/SbRC/KN 3089, 1 ex, (TL 31.8 mm, SL 24.3 mm, BD 4.5 mm, HL 10.1 mm), Pullivasal Island, Gulf of Mannar Marine National Park (9°14'55.01"N; 79°11'3.25"E), 24.01.2020, Coll: Sreeraj, C.R.

Diagnostic characters: *Silhouettea indica* is diagnosed from congeners in having a combination of the following characters - First dorsal VI; Second dorsal I, 10; Anal I, 12; Pectoral rays 15; Caudal fin rays 15. Small fish with elongated and compressed body. Depressed head with dorso-laterally situated eyes. Terminal and oblique mouth with prominent lower jaw. 2-3 medially placed caniniform teeth on jaws. Gill opening extending below the rear margin of preopercle. Caudal peduncle compressed and rounded caudal fin. Ctenoid scales. No scales on cheek or opercle. Light muddy coloured body with pale white ventral region, small dark brown blotches scattered above the mid dorsal as well as head region. Pale white coloured dorsal fins yellow coloured dorsally with white fin tip. Lateral rows of orange/red blotches on the dorsal fins. Caudal fin with orange and white vertical stripes and narrow white coloured fin outline, Anal fin dark brown in colour (Figure 3).

Distribution: India: Godavari estuary, Andhra Pradesh (Padmavathi, 2017), GoM (Present study). *Elsewhere:* Endemic to India.

Remarks: Found solitary in the shallow (less than 30 cm depth) silty coral reef area. The bend head and gape in the specimen happened due to death by asphyxiation (Figure 3). As the breakwater zone is rich in oxygen saturation, this species cannot survive in low oxygenated



Figure 3. *Silhouettea indica* Visweswara Rao, 1971.

normal water. It is quite tough to point out the specimen in this zone and so far, no work on this genus had been done after Rao discovered it on 1971.

Discussion

The recent checklist of fishes from the GoM region listed a total of 1182 species of fishes which included 30 species of Gobiids from the GoM region (Joshi *et al.*, 2016). Considering the varied ecosystems as well as the vast coral reef area, this number of reported of gobiid fishes are very less in comparison to other regions such as Andaman and Nicobar Islands which harbours 117 species (Rajan *et al.*, 2013). This is the first report of *S. indica* outside the Godavari delta region. Also, species of the genus of *Istigobius* are quite rarely seen, as it has been reported from Andaman Island and intertidal pools of Goa previously (Rajan *et al.*, 2013; Tsering *et al.*, 2012).

This present work suggests that, these species can have a wide distribution along the coastal India. This reiterate that further focused survey on the Gobiidae will result in finding more species from this region.

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