



First Record of *Pterois russelii* in the Sunderban Biosphere Reserve, India

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Authors' contributions

This work was carried out in collaboration among all authors. PP assisted during survey and prepared draft manuscript, AS and PM assisted in manuscript preparation and identification process, JSYK collected and identified the specimen and finalized the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Plaintail turkeyfish, *Pterois russelii* Bennett, 1831 had been reported from coastal parts of West Bengal, but there is no record of this species from Sunderban Biosphere Reserve or any part of Indian mangrove ecosystems. The current communication adds *P. russelii*, as a new record to the ichthyofaunal diversity of the Indian Mangroves, as well as Sunderban Biosphere Reserve. The specimen was collected from the Canning fish landing area during a local survey focused on the study of mangrove-associated fishes of Sunderban. Canning is located in the Transitional zone of Sunderban Biosphere Reserve. This is the first record of *P. russelii* from any Indian Mangrove area.

Keywords: Canning; ichthyofauna; Indian mangrove; pterois; Sunderban biosphere reserve; Turkey fish; West Bengal.

1. INTRODUCTION

Sunderban is the largest single mangrove patch in the world and the Indian part of Sunderban covers an area of 2114 sq. km [1]. Majestic

mangroves of Indian Sunderban are popular worldwide due to their fish faunal resources and small riverine channels, mangrove swamps acting as a natural nursery ground are the main reason behind the fact. Sunderban Biosphere

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Reserve, bears about 350 species of fish from 225 genera belonging to 86 families [2].

Family Scorpaenidae comes under the largest diverse order, Perciformes, and is mostly represented by the rock or reef-associated fishes [3,4]. *Pterois* is a genus of turkeyfishes under Scorpaenidae, represented by 12 valid species globally [5,6]. So far only five of the species have been recorded from the marine waters of India and only two of them, namely *P. russelli* Bennett, 1831 and *P. volitans* (Linnaeus, 1758) have been recorded from the coastal parts of West Bengal State [7,8]. From all the mangrove patches in India, Family Scorpaenidae is represented by only one species, *Scorpaenodes guamensis* (Quoy & Gaimard 1824) from Andaman & Nicobar Islands [9]. Scorpionfishes are absent from Indian Sunderban, and henceforth this is the first record of Scorpaenidae, *P. russelli* Bennett, 1831 from Indian Sunderban as well as this communication provides the first evidence for finding *Pterois* from Indian mangrove habitats.

2. MATERIALS AND METHODS

The specimen of *P. russelli* was collected from the Matla River, Canning (22°19'10.92"N; 88°40'27.58"E) on 06th November, 2021 – during the local survey to study mangrove associated ichthyofaunal of Indian Sunderban (Fig. 1). The collection site is located at the transitional zone of Sunderban Biosphere Reserve. After collection, the specimen was brought to the laboratory for photography and there after all the morphometric measurements were taken and preserved in the 10% formaldehyde solution. Morphometries were measured using electronic calipers (upto .01 mm). The preserved specimen is deposited in the National Zoological Collections of the Zoological Survey of India, Sunderban Regional Centre (Accession Number: NZC/ZSI/SbRC/KN5151). The specimen was identified following Allen & Erdmann [10]. The taxonomic classification of this species is followed by the World Register of Marine Species [3].

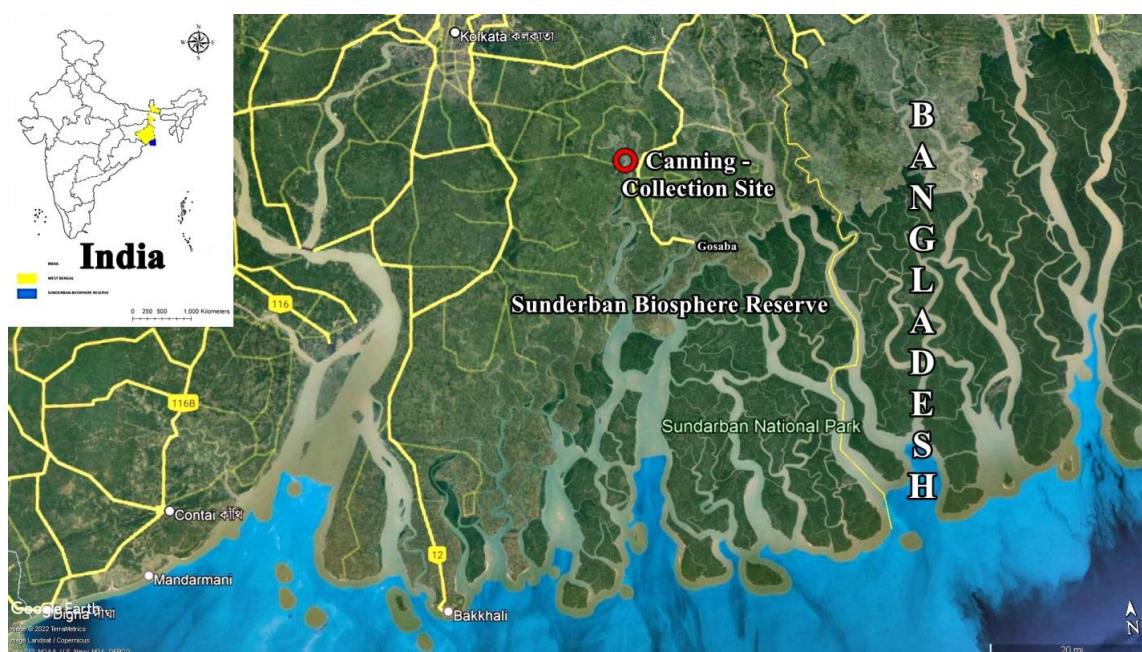


Fig. 1. Map of showing the collection sites from Sunderban biosphere reserve

3. RESULTS

The details of the newly reported species are given below:

Phylum: Chordata

Class: Actinopteri Cope, 1871

Order: Perciformes Bleeker, 1863

Family: Scorpaenidae Risso, 1827

Genus: *Pterois* Oken, 1817

***Pterois russelii* Bennett, 1831**

Common Name - Plaintail turkeyfish
IUCN status – Least Concern (IUCN Red List 3.1, Date assessed: 03 March 2015).

Commercial usage – Minor commercial and Public aquarium, venomous [11] 1831. ***Pterois russelii*** Bennett [E. T.] (ex Russell), Proceedings of the Committee of Science and Correspondence of the Zoological Society of London 1830-31, 1:128 (Coromandel coast, India, eastern Indian Ocean), No Type specimen preserved.

3.1 Material Examined

1 semi-adult, Collection locality - Matla River, Canning, West Bengal, India; Geographical Coordinates - 22°19'10.92"N; 88°40'27.58"E, Date of collection - 06.11.2021, Collector: Dr. J.S. Yogesh Kumar, Accession Number: NZC/ZSI/SbRC/KN5151 (Deposited in the National Zoological Collections of ZSI-Sunderban Regional Centre) (Fig. 2).

3.2 Description

Length - Head Length (HL) 51.2 cm; Eye Diameter 7 cm; Inter Orbital Length 9.7cm; Snout

Length 20.7cm; Pectoral Fin Length 106.4 cm; Pelvic Fin length 58.4 cm; Anal Fin Length 21.3 cm; Pre-dorsal Length 49.5 cm; Pre-anal Length 97.4 cm; Pre-pectoral Length 53.1 cm; Pre-pelvic Length 57 cm; Body Depth 51 cm; Upper Jaw Length 24.4 cm; Caudal Peduncle Length 21.5 cm; Caudal Peduncle Depth 14.3 cm; Caudal Fin Length 46.8 cm.

Fin - Dorsal-fin with XIII spine, 11 fin rays; anal-fin with III spine, 8 fin rays; pelvic-fin with I spine, 5 fin rays; pectoral-fin with 13 fin rays and caudal fin with 14 soft rays. Scales: Number of lateral-line scales 28; scales above lateral line 10; scales below lateral line 14; scale rows between last dorsal-fin spine base and lateral line 9; predorsal-fin scale rows 4; cheek scale (horizontal) row 3; cheek scale (oblique) row 6; cheek scale (vertical) row 4. Gill: Gill rakers 5 + 11 (2 rakers on hypobranchial).

3.3. Coloration and Shape

Body slender and elongated, laterally compressed, depth moderate. Caudal peduncle short, low, depth less than the length. Head large, length greater than body depth. A pair of short barbells on tip of the snout (visible in the fresh specimen). A long tentacle on supra ocular

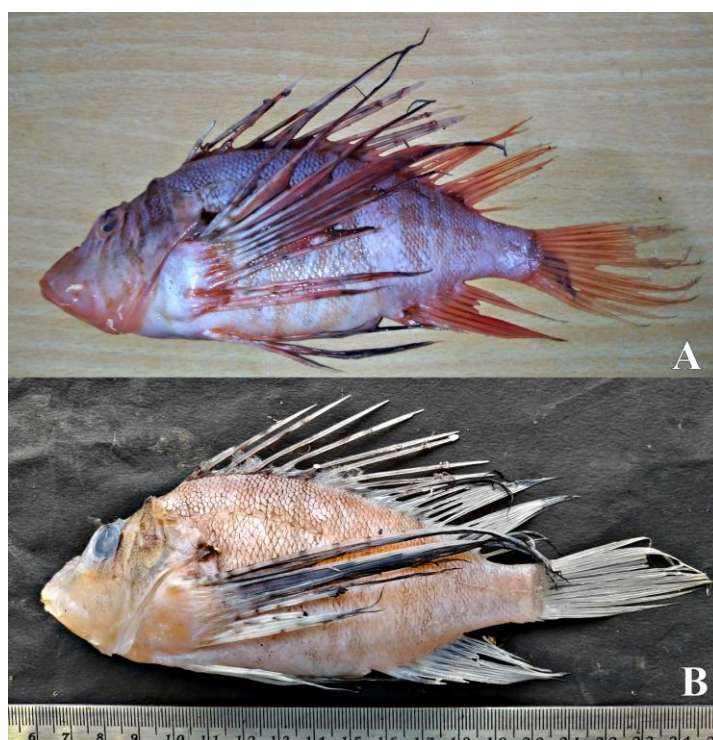


Fig. 2. *Pterois russelii* Bennett, 1831: A – Fresh & B – Preserved specimen, deposited in Zoological Survey of India, Sunderban Regional Centre

characterized by wavy lateral ridges. There are two small leaf-like flaps on pre-opercle margin. A very small skin flap present anterodorsally on orbit surface. Two medium-sized tentacles are present on both sides of the upper lip of the lip joining portion. The head and body are covered with small cycloid scales. Jaws, snout, interopercular and occipital area without scales. Out of 13 dorsal spines 6th one is the longest, and in the anal fin, 3rd spine is much longer than the other (Fig. 2).

3.4 Comments

P. russellii is a reef-associated fish as it can be seen mostly in reef areas. However, the present collection locality of the species is from a full muddy bottom, mangrove area. The sample was collected during the end of high tide and the water column height was almost 6 - 8 feet. The salinity was measured from river water was 3.7 ppt and the pH of the water was 8.3 with a temperature of 21.3°C. The sample was caught by a local fisherman using hand-rowed country craft and floating trap nets and then it was collected by the survey team member from the mentioned coordinates.

4. DISCUSSION

Pterois is a genus, mainly occupying benthic habitats and can be found in the marine reef areas [12]. *P. russellii* has been recorded from almost all of the coastal states of India, West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, Kerala, Goa, and Gujrat [11]. So far, all these states except West Bengal have reef areas and for that reason finding *P. russellii* from other states except West Bengal, would not raise any question regarding its presence or habitat preference. As for the state of West Bengal, *P. russellii* has been reported from Digha, which is a typical marine side and so it is possible to find the species there because it can travel from reef areas near to that place.

Although evidence is there of *P. russellii* being present from the muddy substratum, it is quite uncommon or rare to find this species in a mangrove habitat [13]. This can be proved by the fact, that, only one species of Scorpionfish is reported from all the mangrove ecosystems of India [9]. Sen *et al.* reported such a reef fish named *Abudefduf vaigiensis* (Quoy & Gaimard, 1825) from the Indian Sunderban and raised a question about the presence of hidden rocky substratum in the area [14]. Although their

collection locality is far south in Sunderban, but Canning (present collection locality) is almost 80 km northwards in the Sunderban and siltation is far high at this point of Matla river, so the questionable presence of rocky substratum cannot be the reason behind the presence of *P. russellii*, which is also a reef-associated fish like *Abudefduf*. Habitat preference of *P. russellii* towards muddy substratum can be a reason behind its presence from a typical mangrove ecosystem.

Matla river, which is the collection site, is only getting water from the sea, almost acting like a backwater system and fresh water mixing is very less during the winter season because of less rainfall. During this collection time, the salinity was quite high compared to the other time as it was during high tide and a winter season, so the river was filled with only sea water. During the collection time temperature is also higher than the normal (IMD-<http://imd-kolkata.gov.in/acwc/rfdistribution/view>), so it might have been possible that the fish is coming far from the south, directly from the sea with the influx of sea water. High temperature, higher salinity and influx of sea water, so far in north may be the reason behind the present finding and therefore, raising the question of, how many pure marine species are coming, inland to this far distance from the sea and how they are tolerating a high level of salinity variation? To answer this question, further investigation by collecting data on ichthyofaunal diversity as well as physio-chemical data on different river channels is required.

5. CONCLUSION

Sunderban being such a productive ecosystem harbors a lot of fish fauna and 70 percent of Sunderbans financial economy for the local people has been drawn from aquatic natural resources [15]. A lot of work has been done to study the ichthyofaunal resources from several decades ago. However, even now this new record provides the importance of ichthyofaunal study in this area as by recording the whole diversity, their habitat can be studied for better protective efforts and conservation tactics. Therefore, a long-term and continuous study to record the Ichthyofaunal diversity would be necessary for understanding the long-term effects on the ecosystem and ichthyofaunal resources. So far from this study the presence of *P. russellii* from Sunderban Biosphere Reserve as well as from Indian mangroves has been

recorded, which adds to the rockfish diversity catalogue of Indian Mangroves and creates an array for discovering new distributional record from Indian mangroves as well as from Sunderban Biosphere Reserve.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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