Short Research Article

First record of *Pteroisrusselii* in the Sunderban Biosphere Reserve, India.

Abstract

Plaintailturkeyfish, *Pteroisrusselii* 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 ofIndian 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 fromthe Canning fish landing area during alocal 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 andthe 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 Reserve, bears about 350 species of fish from 225 genera belonging to 86 families [2].

Family Scorpaenidae comes under the largest diverse order, Perciformes, andis 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,FamilyScorpaenidaeis represented by only one species, *Scorpaenodesguamensis* (Quoy&Gaimard 1824) from Andaman & Nicobar Islands [9]. Scorpionfishes are absent from Indian Sunderban, andhenceforth this is the first record of Scorpaenidae, *P. russelli*Bennett, 1831from Indian Sunderban as well as this communication providesthe first evidence for finding *Pterois* from Indian mangrove habitats.

2. Material 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 usingelectronic 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 identifiedfollowingAllen & Erdmann [10]. Thetaxonomic classification of this species is followed bythe World Register of Marine Species [3].

3. Results

The details of the newly reported species are given below:

Phylum : Chordata
Class : Actinopteri Cope, 1871
Order : PerciformesBleeker, 1863
Family : ScorpaenidaeRisso, 1827
Genus : PteroisOken, 1817

***Pteroisrusselii* Bennett, 1831**

Common Name - Plaintailturkeyfish
IUCN status – Least Concern (IUCN Red List 3.1, Date assessed: 03 March 2015)
Commercial usage – Minor commercial and Public aquarium, venomous [11]

1831. ***Pteroisrusselii*** 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, 11fin 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 & 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 ofthe snout (visible inthe fresh specimen).A long tentacle on supra ocular 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-sizedtentacles are present on both sidesof the upper lip of the lip joining portion. The head and bodyare covered with small cycloid scales. Jaws, snout, interopercular and occipital area without scales. Out of 13 dorsal spines 6th one isthe longest, andin the anal fin, 3rd spine is much longer thanthe other (Fig 2).

3.4. Comments –*P.russelii* is a reef-associated fish as it can be seen mostly in reef areas. However,thepresent collection locality of the species is from afull muddy bottom, mangrove area. The sample was collected duringthe endof high tide andthe water column height was almost 6 - 8 feet. The salinitywas measured from river water was 3.7 ppt andthe 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 netsand then it was collected by the survey team member from the mentioned coordinates.

4. Discussion

Pterois is a genus, mainly occupying benthic habitatsand can be found in the marine reef areas [12].*P. russelli*has been recorded from almost all of the coastal states of India, West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, Kerala, Goa, andGujrat [11]. So far, all these states except West Bengal have reef areas and for that reason finding *P. russelii*from other states except West Bengal, would not raise any question regarding its presenceor habitat preference. As for the state of West Bengal, *P. russelii*has been reported from Digha, which is atypical 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. russelli* being present fromthe 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 ofScorpionfishis reported from all the mangrove ecosystems of India[9]. Sen *et al.*reported such a reef fish named *Abudefdufvaigiensis*(Quoy&Gaimard, 1825) from the Indian Sunderban and raised a question about the presence of hidden rocky substratum in the area [14]. Althoughtheir collection locality is far south in Sunderban, but Canning (present collectionlocality) 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. russelii*, which is also a reef-associated fish like *Abudefduf*. Habitat preference of*P. russelii*towards muddy substratum can be a reason behind it's presence fromatypicalmangrove ecosystem.

Matlariver , 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://imdkolkata.gov.in/acwc/rfdistribution/view), so it might have been possible that the fish is coming far fromthe south, directly from the seawith 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 questionof, how many pure marine species are coming,inland to this far distance fromthe 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 harborsa 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 theimportance 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. russelii*fromSunderban Biosphere Reserve as well as from Indian mangroveshas 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.

Reference

1. FSI. State of Forest Report Mangroves. ForestSurvey of India (Ministry of Environment &Forests). Dehradun. 2017;55-61.
2. Mishra SS, Gopi KC. Fish diversity of Indian Sundarban. In: Fauna ofSundarban Biosphere Reserve. Zoological Survey of India, Kolkata. 2017; 107-127.
3. WoRMS Editorial Board. World Register of Marine Species. Accessed 2022-04-08. Available: https://www.marinespecies.org. doi:10.14284/170
4. Love MS. Life history aspects of 19 rockfish species (Scorpaenidae: Sebastes) from the Southern California Bight. NOAA Technical Report NMFS 87. 1990; 1 – 38.
5. Matsunuma and Motomura. Pteroispaucispinula, a new species of lionfish (Scorpaenidae: Pteroinae) from the western Pacific Ocean. Ichthyol. Res.2014;62: 327-346.
6. Matsunuma and Motomura. Redescriptionsof Pteroisradiata and Pteroiscincta (Scorpaenidae: Pteroinae) with notes on geographic morphological variations in P. radiata. Ichthyol. Res. 2015; 63(1): 145-172.
7. Chandra K, Raghunathan C, Mondal T. Faunal Diversity of Biogeographic Zones : Coasts of India. 2020; 1-807. (Published by the Director, Zool. Surv. India, Kolkata).
8. Yennawar P, Mohapatra A, Tudu PC. An account of Ichthyofauna of Digha coast, West Bengal. Rec. zool. Surv. India. 2017; 117(1): 4-21.
9. Mishra SS, Gopi KC, Kosygin L, Rajan PT. Ichthyofauna - Fishes. In: Faunal Diversity of Mangrove Ecosystem in India. 2019; 539-586. (Published by the Director, Zool. Surv. India, Kolkata)
10. Allen GR, Erdmann MV..Pteroisandover, a new species of scorpionfish (Pisces: Scorpaenidae) from Indonesia and Papua New Guinea. Int. J. Ichthyol. 2008; 13(3-4):127-138.
11. Froese R, Pauly D. (eds.) Fishbase, world wideweb electronic ublicationAvailable:http://www.fishbase.org version(04/2022)
12. Galloway KA, Porter ME. Mechanical properties of the venomous spines of Pteroisvolitans and morphology among lionfish species. Journal of Experimental Biology. 2019; 222(6): 197- 905.
13. Kuiter RH,Tonozuka T. 2001. Pictorial guide to Indonesian reef fishes. Part 1. Eels-Snappers, Muraenidae - Lutjanidae. Zoonetics, Australia. 1-302.

14. Sen A, Sreeraj CR, Raghunathan C, Chandra K. First report of the fish family Pomacentridae (Damsel fishes) from Sunderban biosphere reserve, India.International Journal of Fisheries and Aquatic Studies. 2021; 9(1): 142-145
15. Chandra G, Sagar R. 2003. Fisheries in Sundarbans: Problems and Prospects. Available at SSRN: https://ssrn.com/abstract=2084014 or http://dx.doi.org/10.2139/ssrn.2084014

Fig 1: Map of showing the collection sites from Sunderban Biosphere Reserve.

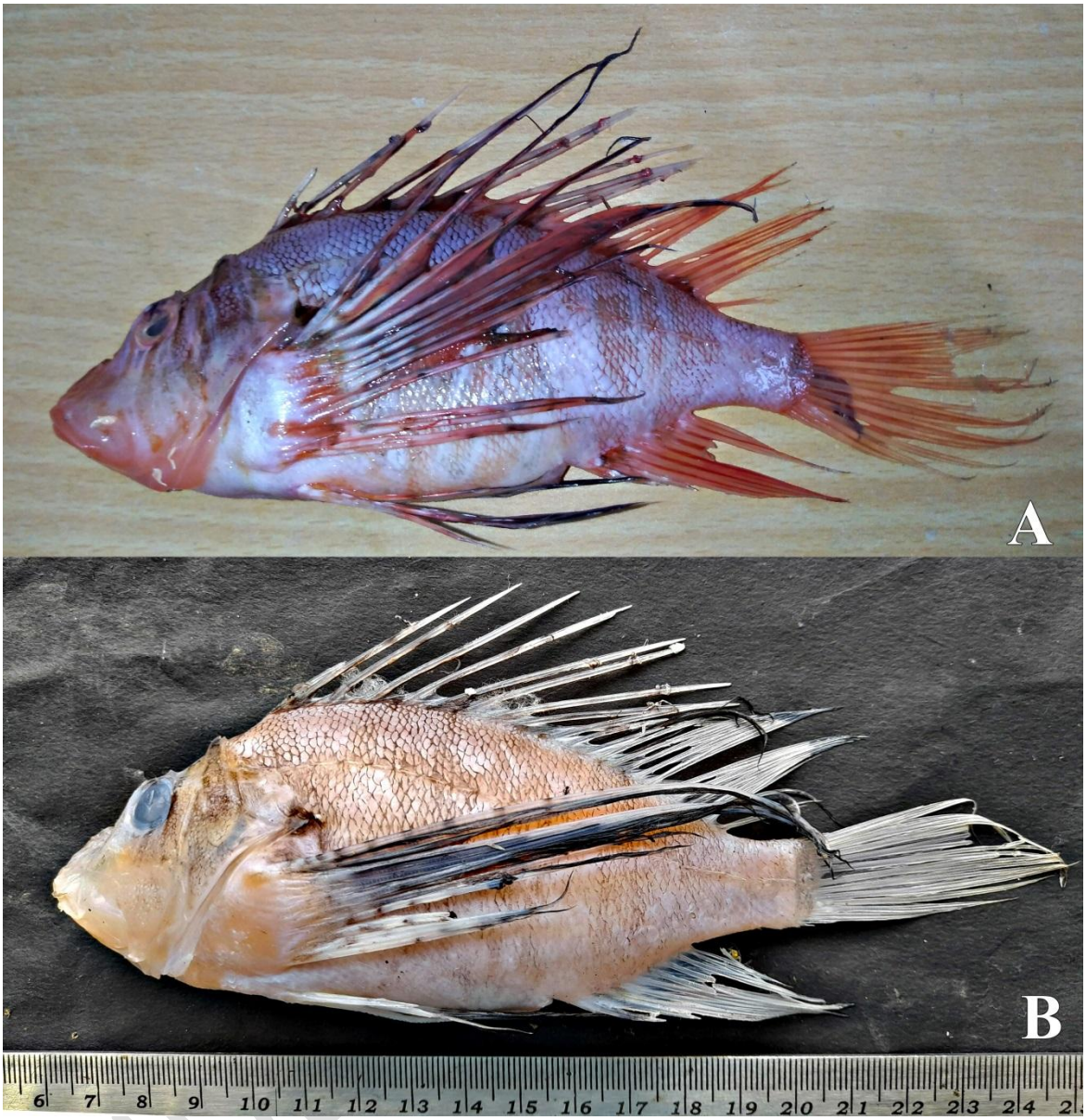

Fig 2: *Pteroisrusselii*Bennett, 1831: A – Fresh & B – Preserved specimen, deposited in Zoological Survey of India, Sunderban Regional Centre.