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Short Communication

New distributional record of *Istigobius diadema* (Steindachner, 1876) and *Lobotes surinamensis* (Bloch 1790) from the Pulicat lagoon, India

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The present study records spectacled sand-goby *Istigobius diadema* (Gobiidae) and tripletail *Lobotes surinamensis* (Lobotidae) for the first time from Pulicat lagoon, India. Morphological and meristic characters for both the species are described herein. This study finds the current observations as new distributional records for the above two species, thereby adding two more additional species to the ichthyofaunal diversity of Pulicat lagoon.

[**Keywords**: Biodiversity, Brackish water, Goby, New record, Triple tail]

Introduction

The Pulicat lagoon in the east coast of India is a brackish water ecosystem which forms the second major saline lagoon in India with an area of about 350 square kilometers[1]. Scientific documentation of fishes of Pulicat lagoon began mostly after the 1950s. The lagoon is reported to have a rich fish diversity of 168 finfish species[2]. Chacko *et al.*[3] reported 65 finfish species from Pulicat lagoon; Selvanathan & Kaliyamurthy[4] reported 81 more species thereby forming a total of 146 species. Further, Devi *et al.*[1] recorded 88 species belonging to 33 families based on previous reports and Mogalekar *et al.*[5] reported 145 fish species from the lagoon. The present study reports spectacled sand-goby *I. diadema* and tripletail *L. surinamensis* for the first time from the Pulicat lagoon which were not reported earlier.

Materials and Methods

One specimen of each *I. diadema* and *L. surinamensis* were collected from the shore seine net operated at Pulicat lagoon (13.5593° N, 80.2098° E) and were preserved with 10 % formalin. The specimens were identified following their original descriptions[6,7] and their current taxonomic status with distributional range were verified with Eschmeyer's catalogue of fishes[8]. Morphometry and meristic counts follow Murdy & Douglass[9] for *I. diadema* and Hubbs & Lagler[10] for *L. surinamensis*. Meristic characters were counted with the aid of stereo zoom microscope and morphometry were taken with a digital caliper to the accuracy of 0.1 mm. The specimens of the above two fishes were deposited in the Museum of TNJFU–Dr. M. G. R. Fisheries College and Research Institute, Ponneri.

Results

1. *Istigobius diadema* (Steindachner, 1876)

Systematics

Order: Gobiiformes Günther, 1880
Family: Gobiidae Cuvier, 1816
Genus: *Istigobius* Whitley, 1932
Istigobius diadema (Steindachner, 1876)

Material examined

TNJFU-MF-06 (Fig. 1: A, B, C), 66.23 mm SL, 1 ex, 07.02.2019, India, Tamil Nadu, Pulicat lagoon, (13.5593° N & 80.2098° E), coll. N. Moulitharan.

Description

First dorsal fin with 6 soft spines, second dorsal fin with 1 unbranched and 11 branched rays; anal fin with 1 soft spine and 10 branched rays; pectoral fin with 23 branched rays; ventral fins united, with 1 unbranched and 5 branched rays each; caudal fin with 2 principal rays and 14 branched rays; lateral scales 33; pre-dorsal scales 17; transverse scales 15. Body moderately elongate (Fig. 1A). Narrow interorbital region with a black stripe running across (Fig. 1B) and extends along the post orbit up to the point in the shoulder adjacent to dorsal fin origin or continues up to 5-6 scales from the base of the pectoral fin on both sides (Fig. 1C). Snout blunts with fleshy lips. Caudal fin pointed and elongated. Detailed morphometry is presented in Table 1.

2. *Lobotes surinamensis* (Bloch 1790)

Systematics

Order: Perciformes Bleeker, 1863
Family: Lobotidae Gill, 1861
Genus: *Lobotes* Cuvier, 1829
Lobotes surinamensis (Bloch 1790)

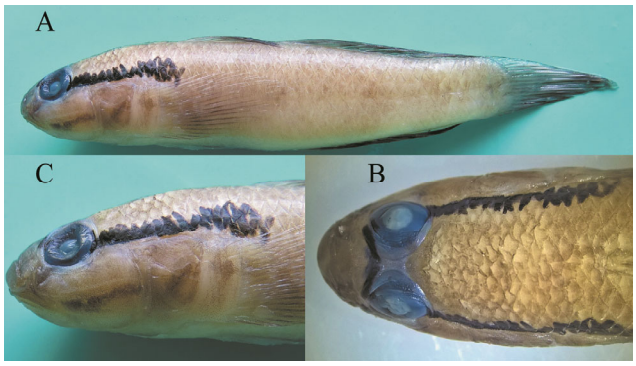

Fig. 1 — *Istigobius diadema* (TNJFU-MF-06), 66.2 mm SL, collected from Pulicat lagoon: A – lateral view; B – Head dorsal view; and C – Head lateral view

Fig. 2 — Formalin preserved specimen of *L. surinamensis* (TNJFU-MF-07), 97.2 mm SL collected from Pulicat lagoon

Material examined

TNJFU-MF-07 (Fig. 2), 97.16 mm SL, 1 ex, 07.02.2019, India, Tamil Nadu, Pulicat lagoon (13.5593° N & 80.2098° E), coll. N. Moulitharan.

Description

Dorsal fin with 12 spines and 16 branched rays; anal fin with three spines and 11 branched rays; pectoral fin with 16 branched rays; pelvic fin with one spine and five rays; caudal fin with two principal rays and 15 branched rays. Caudal and transverse scale rows are 11 and 28, respectively without considering the lateral line pored scale. Continuous lateral line with 51 pored scales which extends up to the last scale in the caudal peduncle.

Body brown with yellow patches over the lateral sides and some dark brown blotches at the dorsal fin base (Fig. 2). Body with prominent ctenoid scales. Rays of the dorsal, anal and caudal fins are with a yellowish white margin. Dorsal and anal fin rays extend parallel to the length of caudal fin appearing tri-lobed. Pectoral fin transparent and extends beyond ventral fin origin. Lower jaw extends a little than the upper jaw. Cheek and opercular plate scaled ctenoid and preopercle with spines. For the details of morphometry see Table 1.

Table 1 — Morphometry and meristic characters of *Istigobius diadema*, TNJFU-MF-06, 66.2 mm SL and *Lobotes surinamensis*, TNJFU-MF-07, 97.2 mm SL

Characters	*Istigobius diadema* (TNJFU-MF-06) (mm)	*Lobotes surinamensis* (TNJFU-MF-07) (mm)	Characters	*Istigobius diadema* (TNJFU-MF-06) (mm)	*Lobotes surinamensis* (TNJFU-MF-07) (mm)
Total length	82.8	115	Anal fin base length	14.9	22.5
Standard length	66.2	97.2	Pectoral fin length	17.1	17.5
Head length	18.2	34.7	Pectoral fin base length	7.0	6.1
Body depth at anus	13.3	43.4	Dorsal fin height	-	20.3
Caudal fin length	19.7	20.8	Dorsal fin base length	-	57.0
Caudal peduncle length	15.6	11.6	1st dorsal fin base length	10.3	-
Caudal peduncle depth	8.5	13.6	2nd dorsal fin base length	17.8	-
Pre dorsal length	21.7	52	Snout length	4.9	9.6
Pre anal length	34.9	66.9	Eye diameter	4.9	6.6
Pre pelvic length	20.2	38.4	Inter orbital width	3.4	9.3
Pre anus length	32	62.3	Lower jaw length	5	11.3
Pre pectoral length	19	35.4	Upper jaw length	7	11.7
Pelvic fin length	15.8	23.8	Pre orbital length	5.1	8.7
Pelvic fin base length	2.2	6.0	Post orbital length	9.0	20
Anal fin length	9.9	19.2	Head depth	12.2	28

Discussion

The genus *Istigobius* Whitley, 1932 with 11 valid species, distributed in the Red sea, Indo-Pacific and North west Pacific regions[8] and the species *I. diadema* is reported to have its distribution in the coasts of Southeast Asia and Northern Australia[8]. *I. diadema* differs from the closely resembling species *I. decoratus* and *I. goldmanni* occuring in the same region by the presence of a greater number of predorsal scales (17 vs. 7–10 in *I. decorates* and 7–9 in *I. goldmanni*); lesser first dorsal fin rays (6 vs. 7 in both *I. decoratus* and *I. goldmanni*) and by the possession of a unique thick, single black stripe which runs from post orbit to the point in the shoulder adjacent to dorsal fin origin (Figs. 1 B & C) on both sides of the head aids in easier differentiation.

Many reports were published in the past two decades regarding the distribution of *I. diadema* there by adding to the extent of its native range. Devi & Chakkaravarthy[11] recorded the species from the Indian waters of Andaman and Nicobar Islands. Kumar *et al.*[12] recorded from the Indian mainland waters of Gulf of Mannar. The present study reports *I. diadema* from the Pulicat lagoon, thus adding to its extended range of distribution.

The monotypic family Lobotidae has two valid species under the genus *Lobotes* Cuvier, 1829 *viz*., *L. pacificus* and *L. surinamensis.* The former has its distribution only in the Eastern Pacific region and the later (*L. surinamensis*) is found in Atlantic, Indian, and Pacific oceans and grows up to a maximum size of about 1 m and 12 kg[13-15]. Distributional records from various parts of tropical seas were being published continuously, extending its native range. In India, occurrences of *L. surinamensis* were reported across the coastal waters from the Malabar coast[16], Pudhucherry[16], West Bengal[17], Odisha coast[18], Gulf of Mannar[19], Vellar estuary[20] and Vishakhapatnam[21]. No records exist from the inland brackish water lagoons of India. This study reports the occurrence of *L. surinamensis* in the Pulicat lagoon.

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Conflict of Interest

Authors declare no conflict of interest.

Author Contributions

NM: Specimen collection, identification, morphometric & meristic analysis and drafting manuscript; JP: Identification, drafting & improvising manuscript; NJ & AU: Reviewing and manuscript finalising; PK: Specimen collection & field assistance.

References

1 Devi K R, Indra T J & Raghunathan M B, Fishes of Pulicat lake, *Rec Zool Surv India*, 102 (3) (2004) 33–42.

2 Sanjeeva Raj P J, Macro fauna of Pulicat Lake, *NBA Bull*, 6 (2006) pp. 67.

3 Chacko P I, Abraham J G & Andal R, Report on a survey of the flora fauna and fisheries of the Pulicat Lake, Madras State, India, *Contr Fresh W Fish Biol Stn*, 8 (1953) pp. 20.

4 Selvanathan M & Kaliyamurthy M, On some new records of fishes from the Pulicat lake, East coast of India, *Rec Zool Surv India*, 67 (1972) 367–371.

5 Mogalekar H S, Canciyal J, Jawahar P, Patadiya D S, Sudhan C, *et al.*, Estuarine fish diversity of Tamil Nadu, India, *Indian J Geo-Mar Sci*, 46 (10) (2017) 1968–1985.

6 Steindachner F, Ichthyologische Beiträge (V), *Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften. Mathematisch-Naturwissenschaftliche Classe*, Vol 74, 1876, pp. 49–240, Pls. 1–15.

7 Bloch M E, *Naturgeschichte der ausländischen Fische*, *Berlin*, Vol 4, 1790, pp. i-xii + pp. 1-128, Pls. 217–252.

8 Fricke R, Eschmeyer W N & Van der Laan R (eds), *Eschmeyer's catalogue of fishes: genera, species, references*. Electronic version accessed 04.07.2021. http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp

9 Murdy E O & Douglass F H, *Revision of the gobiid fish genus Istigobius*, (Bishop Museum Press), 1985, pp. 41.

10 Hubbs C L & Lagler K F, *The fishes of the Great Lakes region*, *Ann Arbor*, (Univ Mich Press), 1958, pp. 213.

11 Devi K & Madhan C V, A new record of Reef Fish *Istigobius diadema* (Steindachner 1876), from Andaman island, *J Bombay Nat Hist Soc*, 107 (2) (2010) 179-180.

12 Kumar T T A, Prakash S, Rao R V & Gunasundari V, First record of two species of goby fish, *Cryptocentrus cyanotaenia* Bleeker and *Istigobius diadema* Steindachner (Perciformes: Gobiidae) in Indian waters, *Indian J Geo-Mar Mar Sci*, 44 (8) (2015) 1252–1256.

13 Weber M W C & de Beaufort L F, *The Fishes of the Indo-Australian Archipelago: Perciformes (continued). Families: Chaetodontidae, Toxotidae, Monodactylidae, Pempheridae, Kyphosidae, Lutjanidae, Lobotidae, Sparidae, Nandidae, Sciaenidae, Malacanthidae, Cepolidae*, VII, (E J Brill), 1936, pp. 440.

14 Smith J L B, *The fishes of Southern Africa, with illustrations by Margaret M, Smith*, (Cape Town: Central News Agency, Ltd. S. Africa), 1961.

15 Carpenter K E & Niem V H, *The living marine resources of the Western Central Pacific. Volume 6. Bony fishes part 4 (Labridae to Latimeriidae), estuarine crocodiles, sea turtles, sea snakes and marine mammals*, (FAO), 2001, pp. 3381–4218.

16 Cuvier G & Valenciennes A, *Natural History of Fishes*, 5 (1830) pp. 1–499.

17 Günther A C, *Catalogue of the fishes in the British Museum*, 1 (1859) pp. 1–524.

18 Tripathy N K & Das C C, Karyotypes of five Indian Perciform fishes, *Copeia*, 1 (1988) 231–233.
19 Gopalakrishnan A, Divya P R, Basheer V S, Rajaswaminathan T, Kathirvelpandian A, *et al*., *Macro Flora & Fauna of the Gulf of Mannar a checklist*, (NBFGR, Lucknow, U.P. India), 2012, pp. 127.
20 Murugan S, Khan S A, Lyla P S, Manokaran S, Raja S, *et al*., Spatial and temporal variability in fish diversity of Vellar Estuary (South East Coast of India), *ARRB*, 4 (13) (2014) 2147–2162.
21 Sirisha M, Krishna P, Sree R K, Rushinadha R & Annapoorna Y, A study on seasonal variation of proximate composition of triple tail, *Lobotes surinamensis* (bloch, 1790) from Visakhapatnam f ishing harbor, East coast of India, *IJCRT*, 6 (1) (2018) 77–86.