

# First record of the silver-cheeked toad fish *Lagocephalus scleratus* (Gmelin, 1789) (Actinopterygii: Tetraodontidae) from Chennai coastal waters, Southeast India

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## Abstract

The silver-cheeked toad fish, *Lagocephalus scleratus*, was recorded for the first time on 25 September 2014. Two specimens of this fish species were collected from the by-catch landed by a commercial deep-sea trawler at Kasimedu Fishing Harbour, Chennai coast, Southeast India. The morphometric and meristic characters of the recorded specimens are described and discussed. The specimen was compared with earlier reports.

**Keywords:** Silver-cheeked toad fish; *Lagocephalus scleratus*; Kasimedu; Chennai Coast

## 1 | INTRODUCTION

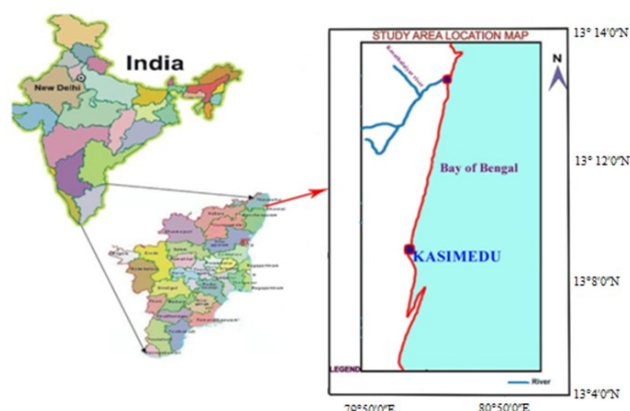
The family Tetraodontidae comprises approximately 20 genera and at least 121 species of puffer fish. The genus *Lagocephalus* is represented by 19 genera and 130 valid species (Froese and Pauly 2013). Found primarily at depths ranging from 18 to 100 m, it is also a reef inhabitant (Randall 1995). The silver-cheeked toad fish, *Lagocephalus scleratus* (Gmelin 1789) is widely distributed in the Indo-West Pacific Ocean; in the western Indian Ocean (Smith and Heemstra 1986) it has been reported from South Africa, Oman, and the Maldives (Jinaying *et al.* 2003).

*L. scleratus* was recorded for the first time in the Mediterranean Sea in February 2003 from Gokova Bay (South Aegean Sea, Turkey) (Akylo *et al.* 2005); the species was

observed again at the same location in 2004 (Filz and Er 2004), and in November 2004 from Jaffa along the Israeli coast (Golani and Levy 2005; Galil 2007). Bilecenoglu *et al.* (2006) has reported this species from the southwestern Mediterranean coast of Turkey (Izmir Bay). More reports followed from Rhodes and the Cretan Sea (Corsini *et al.* 2006; Kasapidis *et al.* 2007). Randall (27 Nov 1991) photographed a specimen of *L. scleratus* from the Vizhinjam Coast, India, under water. Rajan *et al.* (2011) listed the fauna from Andaman and Nicobar Islands but provided no details. Recently Bineesh *et al.* (2014) has reported this species from Munambam, south west coast of India. The present specimen is observed for the first time from Chennai coastal waters, southeast coast of India.

## 2 | METHODOLOGY

Two specimens were collected from the by-catch landed by a commercial deep-sea trawler at Kasimedu Fishing Harbour (13°7'36" N, 80°17'52" E) (Figure 1), Chennai, south India on the 25<sup>th</sup> of September 2014. The specimens were caught roughly about 40–50 km north off Chennai harbour at depth range of 50 to 100 m. The specimens were preserved in 5% formalin and deposited in the museum collections, Department of Zoology, Sir Theagaraya College, Chennai, Tamil Nadu (Voucher Number ZOMUZSP-235) (Figure 2). All morphometrics were measured to the nearest 0.1 mm using Vernier callipers. All measurements and counts, morphological descriptions and colour agreed with the descriptions of Smith and Heemstra (1986) and Turan *et al.* (2007). The morphometric and meristic measurements of the specimen collected during the present study are given in Table 1.



**FIGURE 1** Map showing the location of Kasimedu fishing harbour, Chennai coast.



**FIGURE 2** Shows the *Lagocephalus scleratus* (Gmelin 1789) collected from Kasimedu fishing harbour, Chennai coast.

## 3 | RESULTS AND DISCUSSION

### 3.1 | Description

The body is elongated and cylindrical, slightly compressed laterally and ventrally with a tapering caudal peduncle. The body is dark brown with regularly distributed black dots dorsally, and white ventrally. The dorsal area was grey-brownish with black, regularly distributed spots of equal size, covered with small spinules predorsally. No

scales are present on the rest of the body surface. Pelvic fins are absent. The pectoral fin base was black, the dorsal and anal fins are opposite each other with a posterior position, and the caudal fin is lunate. Wide silver bands are present laterally, from the mouth to the caudal fin. The belly was white and rough. A silver blotch was present in front of the eye.

**TABLE 1** Morphometric measurements and meristic counts of *Lagocephalus scleratus* (Gmelin 1789) collected from Kasimedu fishing harbour, Chennai coast

Measurements	Specimen 1		Specimen 2	
	In mm	% of TL	In mm	% of TL
<b>Morphometric</b>				
Total length	136	100	124	100
Standard length	122	89.7	110	88.7
Fork length	129	94.8	118	95.1
Body depth	26	19.1	24	19.3
Head length	32	23.5	31	25.0
Head width	19	13.9	17	13.7
Eye diameter (horizontal)	09	6.6	08	6.4
Eye diameter (vertical)	17	12.5	15	12.0
Caudal peduncle length	34	25.0	30	24.1
Pre orbital length	16	11.7	13	10.4
Pre pectoral length	38	27.9	34	27.4
Pre dorsal length	87	63.9	79	63.7
Dorsal fin base length	09	6.6	07	5.6
Anal fin base length	04	2.9	04	3.2
Pectoral fin length	18	13.2	16	12.9
<b>Meristic counts (n)</b>				
Dorsal fin rays	11		11	
Anal fin rays	09		09	
Pectoral fin rays	16		16	
Caudal fin rays	19		19	

### 3.2 | Distribution

The puffer fish is geographically distributed in the tropical and subtropical marine waters such as the Indian and Pacific Ocean, Red Sea, and southern African shores (Jianying *et al.* 2003; Cappo *et al.* 2007; Al Jufaili *et al.* 2010; Veeruraj *et al.* 2011).

### 3.3 | Remarks

Central Marine Fisheries Research Institute (CMFRI), Cochin, India, preserves a single specimen described by Bineesh *et al.* (2014) as *L. scleratus* (GB. 43.6.15.8). A comparison of the measurements between the above specimen (GB.43.6.15.8) and that of the one present in the museum collections Sir Theagaraya College, Chennai (STC) ZOMUSP-325 are presented in Table 2. In the CMFRI specimen (GB.43.6.15.8) the caudal peduncle length was 125.0 mm; head length 92 mm, and pre orbital length 76 mm; vertical diameter of eye ranged 16 mm; snout length 76 mm. These morphometric characters are very similar to those of the collected specimen described above (Table 2).

*L. scleratus* can be found in a variety of habitats including sandy, rocky substrates and sea grass meadows (Heithaus 2004; Kalogirou *et al.* 2010; Michailidis 2010), in depths ranging from 18 to 100 m, and it has a preference for shallow and intermediate waters (0 to 50 m) (Cinar *et al.* 2011). *L. scleratus* was found to feed on shrimps, fishes, crabs, squids and cuttle fishes. During the early life stages, *L. scleratus* inhabits sandy bottoms where it feeds on various invertebrates. Various studies revealed an ontogenetic diet that shifts to a mollusc diet with increasing size. This can be explained by the shift in habitat from sandy bottoms where invertebrates are its main preys, to *Posidonia oceanica* meadows where the main food items become molluscs such as *Sepia officinalis* and *Octopus vulgaris*. The size at which 50% of individuals have reached maturity was estimated at 36 cm. With increased size, habitat shift to sea grass meadows most possibly occurs to meet both the increased demand in prey availability and requirement for appropriate spawning ground (Kalogirou 2013). While Sabrah *et al.* (2006) determined that the large oceanic species *L. scleratus* in the Gulf of Suez reached maturity at a length of 42.1 cm for males and 43.3 cm for females.

**TABLE 2** Morphometric comparison of *Lagocephalus scleratus* between southeast coast and south west coast of India

Morphometric characters (in mm)	Present study (southeast coast)	Bineesh <i>et al.</i> (2014) (south west coast)
Total length	124-136	540
Standard length	110-122	455
Fork length	118-129	NA
Body depth	24-26	NA
Head length	31-32	139.7
Head width	17-19	92.6
Eye diameter (vertical)	15-17	16.1
Eye diameter (horizontal)	08-09	29.7
Caudal peduncle length	30-34	125
Snout length	13-16	76.7
Pre pectoral length	34-38	NA
Pre dorsal length	79-87	313
Dorsal fin base length	07-09	37.8
Anal fin base length	04-04	30.7
Pectoral fin length	16-18	57.4

NA, Not Evaluated

This fish is known to carry tetrodotoxin (TTX) (Bilecenoglu *et al.* 2006; Kasapidis *et al.* 2007; Sabrah *et al.* 2006) which is a known non-protein organic compound (aminoperhy-droquinazoline) and one of the strongest marine paralytic toxins existing. TTX named after the order of fish from which it is most commonly associated, the Tetraodontiformes or the tetraodon puffer fish (Halstead 1978). TTX can be found in the liver, gonads, intestines, and skin of these fish and can cause death in approximately 60% of persons who ingest it (Ellenhorn and Barceloux 1988).

Although a delicacy in Japanese cuisine, only specialized cooks in Japan are certified to clean, cut, and prepare the dish to ensure the safety standards for consumption. “Fugu” is the Japanese word for puffer fish and the dish prepared from it. Normally species belonging to the genera *Takifugu*, *Lagocephalus*, *Sphoeroides*, and porcupine fish of the genus *Diodon*. Fugu can be lethally poisonous due to its tetrodotoxin; therefore, it must be carefully prepared to remove toxic parts and to avoid contaminating the meat (Davidson 2006).

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**KS, KS & ER** Sample collection and analysis; **KS, KS, AS, ER & ADAJ** data analysis; **AS & ADAJ** manuscript preparation.