

# Checklist of order Tetraodontiformes (Actinopterygii) from Puducherry Coasts, Southeast Coast of India with Nine New Records

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## Abstract

The present study reports 19 species from 14 genera belonging to 6 families under order Tetraodontiformes (Actinopterygii) from the Puducherry coast. *Triacanthus biaculeatus* Bloch, *T. nieuhofi* Bleeker, *Pseudotriacanthus strigilifer* Cantor, *Odonus niger* Ruppell, *Aluterus monoceros* Linnaeus, *Paramonacanthus sulcatus* Hollard, *Arothron immaculatus* Bloch & Schneider, *Torquigener brevipinnis* Regan and *Diodon hystrix* Linnaeus are recorded for the first time from Puducherry waters. The fishery status, palatability, toxicity, and IUCN status of all the species are also given.

**Keywords:** Aquarium Commercial, Porcupinefish, Pufferfish, Reef Associated, Triggerfish

## Introduction

The order Tetraodontiformes is a specialized group of fishes comprising 10 families and 349 species (Matsuura, 2000, 2001, 2003, 2009, 2011, 2014). These groups are notable by the presence of some bony structures and somewhat thick skin covering the body. It can also be identified by the presence of fused teeth, even coloured teeth (red in *Odonus niger* Ruppell, 1836), and their mouth looks beak-like, with large eyes. They range from morphologically primitive deep-water bottom-dwelling Triacanthidae (spike fishes) to those families more typical of shallow water and often associated with coral reefs or surrounding seagrass beds and continental sand and mudflats (Wilson *et al.*, 2008; Pratchett *et al.*, 2008; Matsuura, 2014).

The Union Territory of Puducherry is unique in its ichthyofaunal diversity due to reporting of many new species from the works of Cuvier and Valenciennes (1828-49), Cuvier (1829), Müller and Henle (1838-1841), Day (1875-78), Menon (1961, 1966), and Wongratana (1983). However, a literature review reveals that only meagre information has been available on the ichthyofaunal diversity of Puducherry, including Tetraodontiformes,

since 1983. Laxmilatha *et al.* (2019) documented mesophotic coral ecosystems situated off Puducherry consisting of hard substratum with corals and related biota. In this context, the present study was undertaken to document the occurrence, diversity, and taxonomy of Tetraodontiformes from Puducherry coastal waters with the report of nine species for the first time from the study area.

## Material and Methods

Tetraodontids were collected from five major coastal fish landing centres, namely, Periyakalpet, Pillaichavadi, Solai Nagar, Veerampattinam, and Nallavadu located in Puducherry (11°46' to 12°30' N and 79°36' to 79°53' E), Southeast coast of India from the boats operated in the coastal waters at a depth of 5-50 m, during October 2019 to July 2020. The specimens were collected by random sampling method directly from the bycatch in all landing centres. Immediately after collection, each specimen was washed, photographed, and stored temporarily. Tetraodontiformes are comparatively easy to spot from other fishes due to their catchy, well-defined morphological characters. The specimens were brought

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to the laboratory, washed again, and preserved in 10 % neutral formalin.

Identification of these specimens up to species level was performed using Fish base (Froese and Pauly, 2015), FAO species identification sheets (Fisher & Bianchi, 1984) and published descriptions of reef fish (Matsuura, 2001; Lieske & Myers, 2002; Allen & Erdmann, 2012). Field identification guides (Murugan and Namboothri, 2012), CMFRI special publications on field guides on reef-associated fishes (Rekha Nair & Kuriakose, 2014), and online resources (Fishes of Australia, and Monaco Nature Encyclopaedia). All the identified specimens are deposited in the Marine Biological Research Centre, Zoological Survey of India, Chennai, India.

## Results

In the present study, 19 species belonging to 14 genera and 6 families of order Tetraodontiformes are documented from Puducherry coastal waters. *Triacanthus biaculeatus* Bloch, 1786, *T. nieuhofi* Bleeker, 1852, *Pseudotriacanthus strigilifer* Cantor, 1849, *Odonus niger* Ruppell, 1836, *Aluterus monoceros* Linnaeus, 1758, *Paramonacanthus sulcatus* Hollard, 1854, *Arothron immaculatus* Bloch & Schneider, 1801 *Torquigener brevipinnis* Regan, 1903 and, *Diodon hystrix* Linnaeus, 1758 were found to show first distributional records from Puducherry coastal waters.

Thirteen species (65%), i.e., *Pseudotriacanthus strigilifer*, *Abalistes stellatus* Lacepede, 1798, *Odonus niger*, *Sufflamen fraenatum* Latreille, 1804, *Lagocephalus lunaris* is Bloch and Schneider, 1801, *Lagocephalus inermis* Temminck and Schlegel, 1850, *Tetrosomus gibbosus* Linnaeus, 1758, *Arothron immaculatus*, *Arothron stellatus* Anonymous, 1798, *Chelonodon patoca* Hamilton, 1822, *Cylichthys orbicularis* Bloch, 1785, *Diodon hystrix*, and *Diodon holocanthus* Linnaeus, 1758 were specifically found in the aquarium trade. Five species (30%), i.e., *Triacanthus nieuhofi*, *T. biaculeatus*, *Paramonacanthus choirocephalus*, *Paramonacanthus sulcatus* and *Torquigener brevipinnis* were not viable aquarium fishes (Figure 1A).

Among the 19 species reported, *Aluterus monoceros* (5%) is the only tetraodontid with food trade value (Figure 1A). In Puducherry, except *Abalistes stellatus*, *Sufflamen fraenatum*, and *Aluterus monoceros* (15%), the remaining 16 species (85%) of Tetraodontiformes were non-edible (Figure 1B). But in some parts of Tamil Nadu as well as in India, *L. inermis* and *L. lunaris* were consumed by the local fishermen and gained as a new fishery (Sujitha *et al.*, 2009).

Though the meat of some Tetraodontiformes is considered a delicacy, some of were toxic. In the current study, 10 species (55%), i.e., *Tetrosomus gibbosus*, *Lagocephalus lunaris*, *L. inermis*, *Arothron immaculatus*, *A. stellatus*, *Chelonodon patoca*, *Torquigener brevipinnis*, *Cylichthys orbicularis*, *Diodon hystrix*, and *D. holocanthus* were toxic. The remaining nine species (45%): *Triacanthus nieuhofi*, *T. biaculeatus*, *Pseudotriacanthus strigilifer*, *Abalistes stellatus*, *Odonus niger*, *Sufflamen fraenatum*, *Aluterus monoceros*, *Paramonacanthus choirocephalus*, and *P. sulcatus* were harmless (Figure 1C).

The majority of the tetraodontids in the present study (13 species, 70%) such as *Sufflamen fraenatum*, *Aluterus monoceros*, *Paramonacanthus choirocephalus*, *P. sulcatus*, *Tetrosomus gibbosus*, *Lagocephalus lunaris*, *L. inermis*, *Arothron immaculatus*, *A. stellatus*, *Chelonodon patoca*, *Torquigener brevipinnis*, *Diodon hystrix* and *D. holocanthus* were assessed as Least Concern. The remaining six species (30%), i.e., *Triacanthus nieuhofi*, *T. biaculeatus*, *Pseudotriacanthus strigilifer*, *Abalistes stellatus*, *Odonus niger* and *Cylichthys orbicularis* were placed in the Not Evaluated Category (IUCN, 2019) (Figure 1D).

## Taxonomic Account

Class ACTINOPTERYGII

Order TETRAODONTIFORMES

Family TRIACANTHIDAE

***Triacanthus biaculeatus*** Bloch 1786 (Figure 2A)

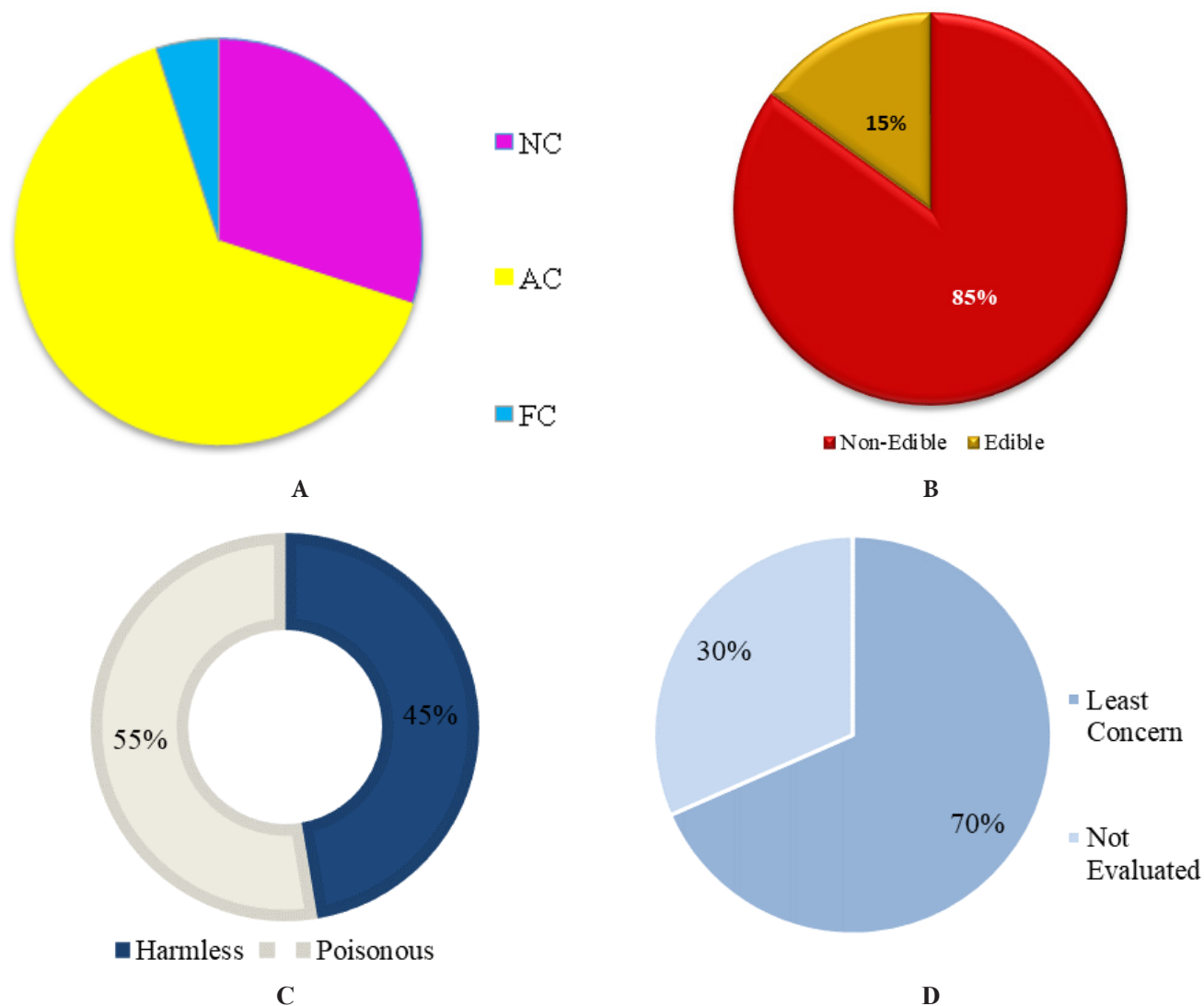
*Material examined*: India: Puducherry, Pillaichavadi Fish Landing Centre (12°0'31"N, 79°51'31"E), 24.xi.2020, 4 exs., leg. Nithya Mary [MBRC/ZSI/F-2444].

*Common Name*: Shortnose Tripod fish. *Habitat*: Marine-demersal. *Diet Pattern*: Benthic Invertebrates.

*Distribution*: India: Puducherry; Andaman (Rao, 2003), Laccadive (Jones & Kumaran, 1980), Kerala (Kumar & Raghavan, 2015), Tamil Nadu (Murugan & Namboothri, 2012), West Bengal (Mahabatra & Lakra, 2015). *Elsewhere*: Indo-West Pacific: Persian Gulf Eastward through the Bay of Bengal to eastern Australia, northward to southern Japan and China (Matsuura, 2001).

***Triacanthus nieuhofi*** Bleeker, 1852 (Figure 2B)

*Material examined*: India: Puducherry, Pillaichavadi fish landing centre (12°0'31", 79°51'31"NE, 4892), 24.xi.2020, 2 ex., leg. Nithya Mary. [MBRC/ZSI/F- 2445].



**Figure 1A-D.** A. Fishery status (NC-Non-Commercial; AC-Aquarium Commercial; FC- Fishery Commercial), B. Palatable Nature, C. Toxicity Status, D. IUCN Status.

**Common Name:** Silver tripod fish. **Habitat:** Marine-Reef Associated. **Diet Pattern:** Benthic Invertebrates.

**Distribution:** India: Puducherry; Tamil Nadu (Jeyasanta & Patterson, 2017), Laccadive (Jones & Kumaran, 1968), Kerala (Kumar & Raghavan, 2015), Odisha (Mohanty *et al.*, 2018). *Elsewhere:* Persian Gulf eastern Australia, Northward to Southern Japan and China (Matsuura, 2001).

***Pseudotriacanthus strigilifer*** Cantor 1850 (Figure 2C)

**Material examined:** India: Puducherry, Veerampattinam fish landing centre (11°53'31", 79°49'38" NE), 25.i.2020,2

ex., leg. Nithya Mary [MBRC/ZSI/F- 2284].

**Common Name:** Long-spined Tripod fish. **Habitat:** Marine-Reef Associated. **Diet Pattern:** Benthic Invertebrates.

**Distribution:** India: Puducherry, Andaman (Rao, 2003), West Bengal (Mahabatra & Lakra, 2015), Tamil Nadu (Murugan & Namboothri, 2012), Kerala (Kumar & Raghavan, 2015), and Gujarat (Singh *et al.*, 2021). *Elsewhere:* Indonesia and, Philippines. Indo-Pacific: Gulf of Oman to Indonesia and the Philippines (Matsuura, 2001)

## Family BALISTIDAE

***Abalistes stellatus*** Lacepède, 1798 (Figure 2D)

*Material examined:* India: Puducherry, Nallavadu fish landing centre (11°51'32", 79°48'56" NE 3543), 25.i.2020, 1 ex., leg. Nithya Mary [MBRC/ZSI/F- 2408].

*Common Name:* Starry triggerfish. *Habitat:* Marine-Reef Associated. *Diet Pattern:* Benthic Invertebrates.

*Distribution:* India: Puducherry; Andaman (Rao, 2003), Tamil Nadu (Abdussamad *et al.*, 2009), Kerala (Kumar & Raghavan, 2015), West Bengal (Gosami, 1992). *Elsewhere:* Red Sea and Persian Gulf (Randall, 1995).

***Odonus niger*** Rüppell, 1836 (Figure 2E)

*Material examined:* India: Puducherry, Nallavadu fish landing centre (11°51'32", 79°48'56" NE 3543), 4 exs, 16.iii.2020, leg. Nithya Mary [MBRC/ZSI/F- 2283].

*Common Name:* Red-toothed triggerfish, Niger trigger, blue trigger, purple trigger, black trigger. *Habitat:* Marine-Reef Associated. *Diet Pattern:* Invertebrates/Zooplankton.

*Distribution:* India: Puducherry, Andaman (Rao, 2003), Tamil Nadu (Abdussamad *et al.*, 2009), Kerala (Kumar & Raghavan, 2015), and Laccadive (Rao, 1991). *Elsewhere:* Red Sea south to Durban, South Africa (Smith & Heemstra, 1986).

***Sufflamen fraenatum*** Latreille, 1804 (Figure 2F)

*Material examined:* India: Puducherry, Nallavadu fish landing centre, (11°51'32", 79°48'56" NE 3543), 25.i.2020, 1 ex., leg. Nithya Mary [MBRC/ZSI/F- 2442].

*Common Name:* Masked triggerfish. *Habitat:* Marine-Reef Associated. *Diet Pattern:* Invertebrates/Zooplankton.

*Distribution:* India: Puducherry, Andaman (Rao, 2003), Andhra Pradesh (Barman *et al.*, 2004), Tamil Nadu (Abdussamad *et al.*, 2009), and Kerala (Kumar & Raghavan, 2015). *Elsewhere:* East Africa south to Natal, South Africa (Smith & Heemstra, 1986).

## Family MONOCANTHIDAE

***Aluterus monoceros*** Linnaeus, 1758 (Figure 2G)

*Material examined:* India: Puducherry, Nallavadu fish landing centre (11°51'32", 79°48'56" NE 3543), Puducherry, 18.ii.2020, 1 ex., leg. Nithya Mary [MBRC/ZSI/F- 2410].

*Common Name:* Unicorn leather jacket, filefish, Smooth Leather jacket, Yellow-finned Leather jacket. *Habitat:* Marine-Reef Associated. *Diet Pattern:* Benthic Invertebrates.

*Distribution:* India: Puducherry, Andaman (Rao, 2003), Tamil Nadu (Abdussamad *et al.*, 2009), Kerala (Bijukumar & Raghavan, 2009). *Elsewhere:* USA to Argentina (Figueiredo & Menezes, 2000).

***Paramonacanthus choirocephalus*** Bleeker 1852 (Figure 2H)

*Material examined:* India: Puducherry, Nallavadu fish landing centre (11°51'32", 79°48'56" NE 3543), 23.xii.2020, 2 ex., leg. Nithya Mary [MBRC/ZSI/F- 2433].

*Common Name:* Pigface Leather jacket. *Habitat:* Marine-Demersal. *Diet Pattern:* Benthic Invertebrates.

*Distribution:* India: Puducherry, Andaman (Rao, 2003), Tamil Nadu (Joshi *et al.*, 2016), Andhra (Peela *et al.*, 2017), Odisha (Pati *et al.*, 2018). *Elsewhere:* Western Pacific (Hutchins, 1997).

***Paramonacanthus sulcatus*** Hollard, 1854 (Figure 2I)

*Material examined:* India: Puducherry, Nallavadu fish landing centre (11°51'32", 79°48'56" NE 3543), 23.xii.2020, 1 ex., leg. Nithya Mary [MBRC/ZSI/F- 2435].

*Common Name:* Mudbank filefish. *Habitat:* Marine-Demersal. *Diet Pattern:* Benthic Invertebrates.

*Distribution:* India: Puducherry. *Elsewhere:* Western Pacific (Hutchins, 1997).

## Family OSTRACIIDAE

***Tetrosomus gibbosus*** Linnaeus, 1758 (Figure 2J)

*Material examined:* India: Puducherry, Veerampattinam fish landing centre, (11°53'31", 79°49'38" NE), 25.i.2020, 1 ex., leg. Nithya Mary [MBRC/ZSI/F- 8326].

*Common Name:* Humpback boxfish, Black-blotched Turret fish. *Habitat:* Marine-Reef Associated. *Diet Pattern:* Benthic Invertebrates.

*Distribution:* India: Puducherry, Andaman (Rao, 2003), Odisha (Pati *et al.*, 2018), Tamil Nadu (Joshi *et al.*, 2016), Andhra Pradesh, Kerala (Baiju *et al.*, 2016). *Elsewhere:* Indo-West Pacific: Red Sea (Smith, 1986).





A



B



C



D



E



F

**Figure 2A-F.** A. *Triacanthus biaculeatus*; B. *Triacanthus nieuhofi*; C. *Pseudotriacanthus strigilifer*; D. *Abalistes stellatus*; E. *Odonus niger*; F. *Sufflamen fraenatum*.

***Lagocephalus lunaris*** Bloch & Schneider, 1801 (Figure 2K)

*Material examined:* India: Puducherry, Pillaichavadi fish landing centre, (12°0'31", 79°51' 31" NE 4892), 23.i.2020, 6 exs., leg. Nithya Mary [MBRC/ZSI/F- 2428].

*Common Name:* Lunar tail puffer, Green Rough-backed Puffer, Moontail Puffer, Spiny back Toadfish. Habitat: Marine-Demersal. Diet Pattern: Benthic Invertebrates.

*Distribution:* India: Puducherry, Andaman (Rao, 2003), West Bengal (Mahabatra & Lakra, 2015), Odisha (Pati *et al.*, 2018), Tamil Nadu (Gopalakrishnan *et al.*, 2012), Kerala (Kumar & Raghavan, 2015). *Elsewhere:* Indo-West Pacific: Red Sea and Persian Gulf, Japan to Australia (Randall, 1995).

***Lagocephalus inermis*** Temminck & Schlegel, 1850 (Figure 2L)

*Common Name:* Smooth blaasop. Habitat: Marine-Demersal. Diet Pattern: Benthic Invertebrates.

*Distribution:* India: Puducherry, Andaman, West Bengal (Mahabatra & Lakra, 2015), Odisha (Pati *et al.*, 2018), Tamil Nadu (Gopalakrishnan *et al.*, 2012), Kerala (Kumar & Raghavan, 2015). *Elsewhere:* Indo-West Pacific (Smith & Heemstra, 1986).

***Arothron immaculatus*** Bloch and Schneider, 1801 (Figure 2M)

*Material examined:* India: Puducherry, Solai Nagar fish landing centre (11°57'86", 79°50'76" NE), 24.xi.2020, 1 ex., leg. Nithya Mary [MBRC/ZSI/F- 2285].

*Common Name:* Immaculate Puffer, Yellow-eye Pufferfish. Habitat: Marine-Reef Associated. Diet Pattern: Benthic Invertebrates.

*Distribution:* India: Puducherry; Andaman (Rao, 2003), West Bengal (Mahabatra and Lakra, 2015), Odisha (Karna *et al.*, 2018), Tamil Nadu (Veeruraj *et al.*, 2011), Kerala (Baiju *et al.*, 2016). *Elsewhere:* Indo-West Pacific (Smith & Heemstra, 1986).

***Arothron stellatus*** Bloch & Schneider, 1801 (Figure 2N)

*Material examined:* India: Puducherry, Pillaichavadi fish landing centre (12°0'31", 79° 51' 31" NE 4892), 23.xii.2020,1 ex., leg. Nithya Mary [MBRC/ZSI/F- 2414].

*Common Name:* Star Puffer, Starry Pufferfish, Starry Toadfish, Stellate Puffer, Stellate Toado. Habitat: Marine-

Reef Associated. Diet Pattern: Benthic Invertebrates.

*Distribution:* India: Puducherry, Andaman (Rao, 2003), West Bengal (Mahabatra & Lakra, 2015), Odisha (Pati *et al.*, 2018), Tamil Nadu (Veeruraj *et al.*, 2011), Kerala (Kumar & Raghavan, 2015). *Elsewhere:* Indo-Pacific: Southern Japan, Southward to Lord Howe Island. (Amaoka *et al.*, 1984).

***Torquigener brevipinnis*** Regan, 1903 (Figure 2O)

*Material examined:* India: Puducherry, Nallavadu fish landing centre (11°51'32", 79°48'56" NE 3543), 20.xii.2020,1 ex., leg. Nithya Mary [MBRC/ZSI/F- 2287].

*Common Name:* Yellow stripe toadfish. Habitat: Marine-Demersal. Diet Pattern: Benthic Invertebrates.

*Distribution:* India: Puducherry, Tamil Nadu (Veeruraj *et al.*, 2011). *Elsewhere:* Indo-West Pacific, Indonesia and Northwestern Australia (Gloerfelt & Kailola, 1984)

***Chelonodon patoca*** Hamilton, 1822 (Figure 2P)

*Material examined:* India: Puducherry, Pillaichavadi fish landing centre (12°0'31", 79° 51' 31" NE 4892), 23.xii.2020,4 ex., leg. Nithya Mary. [MBRC/ZSI/F- 2417].

*Common Name:* Milk spotted puffer, Gangetic Pufferfish, Marbled Toad. Habitat: Marine-Reef Associated. Diet Pattern: Benthic Invertebrates.

*Distribution:* India: Puducherry, Andaman (Rao, 2003), West Bengal (Mahabatra & Lakra, 2015), Odisha (Pati *et al.*, 2018), Tamil Nadu (Veeruraj *et al.*, 2011), Kerala (Arunachalam *et al.*, 2009). *Elsewhere:* Indo-Pacific (Froese & Pauly, 2013)

Family DIODONTIDAE

***Cylichthys orbicularis*** Bloch, 1785 (Figure 2Q)

*Material examined:* India: Puducherry, Pillaichavadi fish landing centre (12°0'31", 79°51'31" NE 4892), 08.xii.2020, 4 exs., leg. Nithya Mary [MARC/ZSI/F- 8310].

*Common Name:* Bird beak burrfish, Fixed Spine Porcupinefish, Orbicular Burrfish, Rounded Porcupinefish, Short-spined Porcupinefish.

*Distribution:* India: Puducherry, Odisha (Karna *et al.*, 2018), Tamil Nadu (Murugan & Namboothri, 2012), Kerala (Baiju *et al.*, 2016). *Elsewhere:* Indo-Pacific (Froese & Pauly, 2013).



G



H



I



J



K



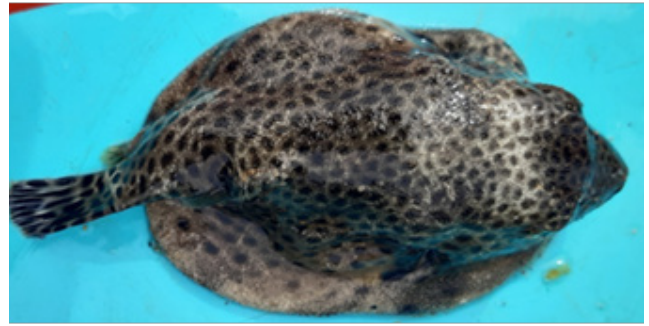
L

**Figure 2G-L.** G. *Aluterus monoceros*; H. *Paramonocanthus choirocephalus*; I. *Paramononthus sulcatus*; J. *Tetrosomus gibbosus*; K. *Lagocephalus lunaris*; L. *Lagocephalus inermis*.





M



N



O



P



Q



R



S

**Figure 2 M-S.** M. *Arothron immaculatus*; N. *Arothron stellatus*; O. *Torquigener brevipinnis*; P. *Chelonodon patoca*; Q. *Cyclichthys orbicularis*; R. *Diodon hystrix*; S. *Diodon holocanthus*.



***Diodon hystrix*** Linnaeus, 1758 (Figure 2R)  
**Material examined:** India: Puducherry, Periyakalpet fish landing centre (12°1'44", 79°21'44" NE 5485), 24.xi.2020, 4 ex., leg. Nithya Mary [MBRC/ZSI/F- 2421].

**Common Name:** Spot-fin porcupine fish. **Habitat:** Marine-Reef Associated. **Diet Pattern:** Benthic Invertebrates.

**Distribution:** India: Puducherry, Andaman (Rao, 2003), West Bengal (Mahabatra & Lakra, 2015), Odisha (Karna *et al.*, 2018), Tamil Nadu (Gopalakrishnan *et al.*, 2012), Kerala (Baiju *et al.*, 2016). **Elsewhere:** Eastern Pacific (De la Cruz *et al.*, 1997), Western Atlantic (Robins and Ray, 1986), Western Indian Ocean (Fricke, 1999).

***Diodon holocanthus*** Linnaeus, 1758 (Figure 2S)

**Material examined:** India: Puducherry, Pillaichavadi fish landing centre (12°0'31", 79° 51' 31" NE 4892), 08.xii. 2020, 2 ex., leg. Nithya Mary [MARC/ZSI/F- 8311].

**Common Name:** Balloon porcupine fish, Longspined porcupine fish. **Habitat:** Marine-Reef Associated. **Diet Pattern:** Benthic Invertebrates.

**Distribution:** India: Puducherry, Andaman (Rao, 2003), Tamil Nadu (Gopalakrishnan *et al.*, 2012), Kerala (Baiju *et al.*, 2016). **Elsewhere:** Western Atlantic: Canada, (Florida Scott and Scott, 1988), Western Indian Ocean: Southern Red Sea to Madagascar, Reunion and Mauritius (Letourneur *et al.*, 2004), Pacific Ocean: Southern Japan South to Lord Howe Island and East to the Hawaiian and Easter islands (Myers, 1999).

## Discussion

Most of the species of Tetraodontiformes occupy wide benthic habitats and are omnipresent within geographical, latitudinal and habitat gradients. The occurrence of nine species *Triacanthus biaculeatus*, *Triacanthus nieuhofi*,

*Pseudotriacanthus strigilifer*, *Paramonacanthus sulcatus*, *Odonus niger*, *Aluterus monoceros*, *Paramonacanthus sulcatus*, first time from the Puducherry coast, East coast of India. It was found that the family Balistidae, Tetraodontidae, and Monacanthidae were very common in all the landing centres and available on all the days except *Diodon hystrix*, which was collected only in Solai Nagar landing centre. Tetraodontidae and Balistidae families dominated over all other families.

Tetraodontiformes *Arothron immaculatus*, *Torquigener brevipinnis* and, *Diodon hystrix* were reported to have important ecological functions in balancing the marine food web by feeding on multiple trophic groups, which indirectly influence the structure and composition of the reefs (Patankar *et al.*, 2018). Though Tetraodontiformes do not have commercial status in fisheries, it was noted most frequently in the recreational fisheries –aquarium trade followed by food trade.

Though the identification and description of puffers are difficult, the taxonomy of Tetraodontiformes is important not only for understanding fish diversity but also for human welfare to appropriately identify the toxicity of species and resource management (Matsuura, 2014). In Puducherry, since fishermen were aware of the toxic nature of Tetraodontids, they did not show any interest in consuming any of these species.

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