

First record of *Paratriacanthodes retrospinis* Fowler, 1934 (Tetraodontiformes: Triacanthodidae) from the Andaman Islands, northeastern Indian Ocean

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Abstract

Paratriacanthodes retrospinis Fowler, 1934 is recorded for the first time from the Andaman Islands, north-eastern Indian Ocean. The specimens were collected during the research expedition of the FORV Sagar Sampada, Cruise from west of the Andaman Islands, at a depth of 290 m. The morphometric and meristic characters, description and distribution range of the collected specimens are presented in this study.

Keywords: Spikefishes, New record, Distribution, Indian Ocean.

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Introduction

The spikefishes of the family Triacanthodidae mainly occur benthic at depths between 100 to 600 m on continental shelves and slopes (Tyler 1968; Matsuura and Tyler 1997). Within the family, a total of 11 valid genera and 23 species (Eschmeyer et al. 2017) are distinguished. They are characterised by a deep and slightly compressed body, covered by a moderately thick skin with numerous small scales with a roughly shagreen-like appearance; two separate dorsal fins, six spines in the first dorsal fin and 12-18 soft rays in the second dorsal fin; caudal fin rounded to almost truncate; most dorsal-, anal-, and pectoral-fin rays branched; pelvic fins with a large spine and one or two inconspicuous and rudimentary soft rays; mouth small and usually terminal; teeth of moderate size, usually conical, 10 or more in an outer series in each jaw; caudal peduncle compressed, deeper than wide, not distinctly tapered (Matsuura 2001).

Spikefishes are relatively poorly known in terms of taxonomy and biology among tetraodontiform families (Matsuura 2014), although Tyler (1968) contributed a significant revision of the taxonomy of the Triacanthodidae and Triacanthidae.

The genus *Paratriacanthodes* Fowler 1934 is characterised by a well-developed spiny dorsal fin, six spines decreasing gradually in length from the first to the last; mouth terminal or only very slightly supraterminal, of moderate width; snout short, 11-14%SL; gill opening moderate, 4-8%SL; scales with a moderate number of upright spinules, not branching distally; teeth small, conical, in a single series in each jaw without an inner series of smaller teeth (Tyler 1968). A similar species that is also known from the northern Indian Ocean, *Mephisto fraserbrunneri* Tyler 1966, is distinguished from the species of *Paratriacanthodes* by an extremely long gill opening, 13-14%SL, reaching ventrally to slightly below level of lower edge of pectoral-fin base (versus gill opening moderate, 4-8%SL, reaching ventrally to between levels of 1/3 to 4/5 of pectoral-fin base in *Paratriacanthodes*) (Tyler 1966, 1968).

Three species are currently known in the genus *Paratriacanthodes*: *Paratriacanthodes abei* Tyler 1997 from the South China Sea, *P. herrei* Myers 1934 from the western Pacific and *P. retrospinis* Fowler 1934 that is widespread in the Indo-West Pacific from South and East Africa to southern Japan and New Caledonia (Eschmeyer et al. 2017). This study aimed to report the first record of *P. retrospinis* from the Andaman Islands, north-eastern Indian Ocean.

Material and Methods

The specimens of the present study were collected by the FORV Sagar Sampada, during Cruise 349 from west of the Andaman Islands, at a depth of 290 m (12°05'N, 92°12'E) (Fig. 1), conducted by the Centre for Marine Living Resources and Ecology (CMLRE), Ministry of Earth Sciences, India. A High-Speed Demersal Trawl (Crustacean Version) was used for bottom trawling.

Morphometric characters were measured to the nearest 0.1 mm based on Tyler (1968). Standard length (SL) is measured from the tip of the snout to the end of the hypural complex. Head length (HL) and interorbital width are measured to their bony margins. Descriptive methods follow Tyler (1968). Proportions of the morphometric measurements are expressed as percentage of SL. Meristic counts of fin spines and rays follow Fricke (1983). Nomenclature follows Eschmeyer et al. (2017), references and journals follow Fricke (2017) and Fricke and Eschmeyer (2017b), respectively.

A distribution map was created using R software (R core team 2016) with 'marmap' package (Pante and Simon-Bouhet 2013), another using QGIS Version 2.12.2. Environmental parameters were measured using Sea-Bird SBE 9, Software Version Seasave V7.22. Abbreviations of fish collections cited in the present paper follow Fricke and Eschmeyer (2017a). The specimens were preserved in 5% buffered formaldehyde solution and deposited at the CMFRI Referral Museum, catalogue no: GB 43.8.10.5

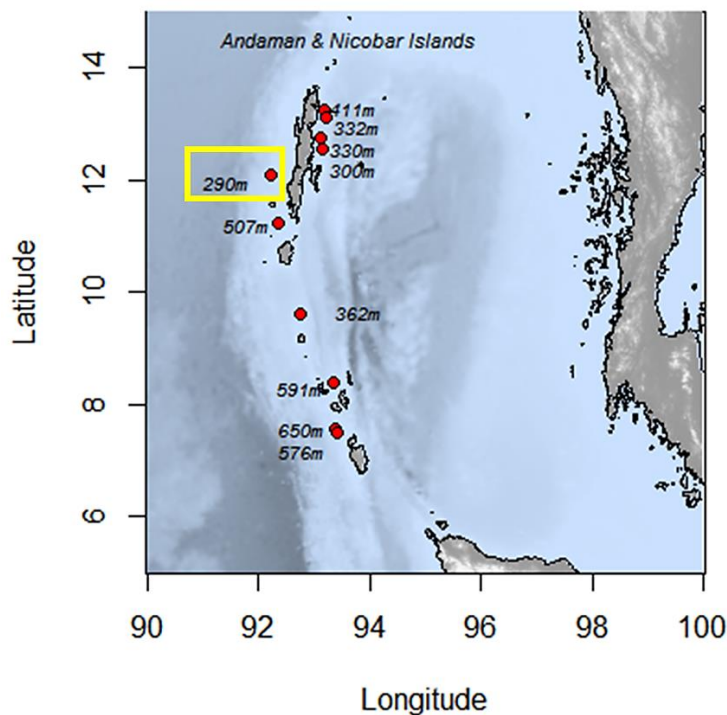


Figure 1. Map of the survey sites of Cruise No: 349 FORV Sagar Sampada. The collecting site of *Paratriacanthodes retrospinis* is highlighted in a yellow box.

Results and Discussion

Diagnosis: Dorsal fin VI+14-16; anal fin 13-14; pectoral fin 13; pelvic fin 1+1. A strongly compressed body; head small, conical, upper and lower sides slightly concave; eyes very large, projecting; eye diameter 16.55 (14.86-17.09) %SL, 37.99%HL; inter-orbital space concave and small; mouth pointed, with projecting jaws bearing numerous sharp, conical teeth in upper and lower jaws; gill openings forming a comparatively small vertical slit in the front of pectoral fin; rough scales with spinules; dorsal spines without grooves, pelvic spines grooved base to the end, first dorsal spine inserted over gill opening; first to last dorsal spines decreasing in length, sixth dorsal spine poorly visible. Dorsally bright orange, ventrally pale red and white.



Figure 2. *Paratriacanthodes retrospinis*, CMFRI GB 43.8.10.5, 70.7 mm SL, off Andaman Islands; colouration immediately after collection.



Figure 3. *Paratriacanthodes retrospinis*, CMFRI GB 43.8.10.5, 70.7 mm SL, off Andaman Islands; colouration of specimen in preservative.

Description: Morphometric characters are presented in percentage of SL (Table 1). Head with slightly concave profile in upper and lower sides. Snout short and pointed at upper end. Eye large, projecting outward. Gill openings are relatively very short. Meristic characters are summarised in Table 2. Meristic characters of the fins, gill rakers, and teeth are similar to those of *P. retrospinis*.

Colour of fresh specimen: Bright orange in upper half and pale colour in lower side in lateral view (Fig. 2).

Colour in preservative: Specimens pigmented, but eyes and abdomen region slightly bluish black. Gill chamber and peritoneum black (Fig. 3).

Environmental factors: The species was caught at a depth of 290m, some of the abiotic factors at the particular depth were measured using Sea-Bird SBE 9 as follows: Temperature (11.60°C), salinity (35.03 psu), DO (0.511 ml.L⁻¹), pressure (273.745 db), water density (26.6847 Kg/m³), turbidity (0.2658 NTU) and conductivity (3.984252 S/m).

Two species of *Paratriacanthodes* have rather restricted distribution ranges in either the South China Sea (*P.*

Table 1. Morphometric and meristic characters of the collected *Paratriacanthodes retrospinis* from the Andaman Islands (n=7).

Characters	Range
Total length(mm)	80.0-87.8
Standard length (mm)	64.2-71.5
Weight (g)	13.2-17.5
Morphometric characters as % SL	
Body depth	44.8-47.6
Head length	39.1-43.6
Head depth	35.9-44.6
Postorbital length	26.1-28.9
Eye diameter	14.0-17.1
Preorbital length	11.6-13.4
Predorsal length	44.1-47.4
Prepectoral length	45.1-45.6
Prepelvic length	43.9-45.1
Oreanal length	72.4-76.3
Caudal peduncle length	12.4-15.6
Caudal peduncle depth	9.4-12.0
Dorsal-fin length	44.6-53.0
Anal-fin length	4.3-15.7
Pectoral-fin length	14.6-17.5
Pelvic-fin length	30.1-34.0
Caudal-fin length	21.6-24.3
First dorsal-fin spine length	29.0-33.7
Pelvic-fin spine length	28.7-34.2
Maxillary length	4.4-6.1
Mandibular length	4.3-5.0
Meristic counts	
Dorsal-fin spines	6
Dorsal-fin rays	14
Anal-fin rays	14
Pelvic-fin spines	1
Caudal fin rays	12

Table 2. Comparison of meristic characters of the collected *Paratriacanthodes retrospinis* with those of *P. retrospinis* and *Mephisto fraserbrunneri* from earlier studies.

	<i>P. retrospinis</i>	<i>M. fraserbrunneri</i>	Present study
Dorsal fin rays	14-16	16	14-16
Anal fin rays	12-14	14	13-14
Pectoral rays	13-15	14	13
Pelvic rays	1	1	1
Olfactory lamellae	10-13	9-10	10-13
Pseudobranch lamellae	12-16	18-19	12-16
Gill rakers	17-23	19	18
Teeth, upper jaw	10-18	17	15
Teeth, lower jaw	15-24	19-20	24

abei) or the adjacent Philippines (*P. herrei*), but *P. retrospinis* is widely distributed outside the area (Tyler 1997) (Fig. 4). *Paratriacanthodes retrospinis* has been previously reported from South Africa, Mozambique and Madagascar east to Fiji, north to southern Japan, south to the Norfolk Ridge south of New Caledonia (Tyler 1968; Matsuura and Tyler 1997; Hutchins 2001; Hoese et al. 2006; MNHN materials examined by Ronald Fricke). The species has also been reported from off the south-west coast of India (Sirajudheen and Bijukumar 2012) (Fig. 4). The current study widely extends the distribution range to the Andaman Islands, India, and provides the first record of the species from the northeastern Indian Ocean.

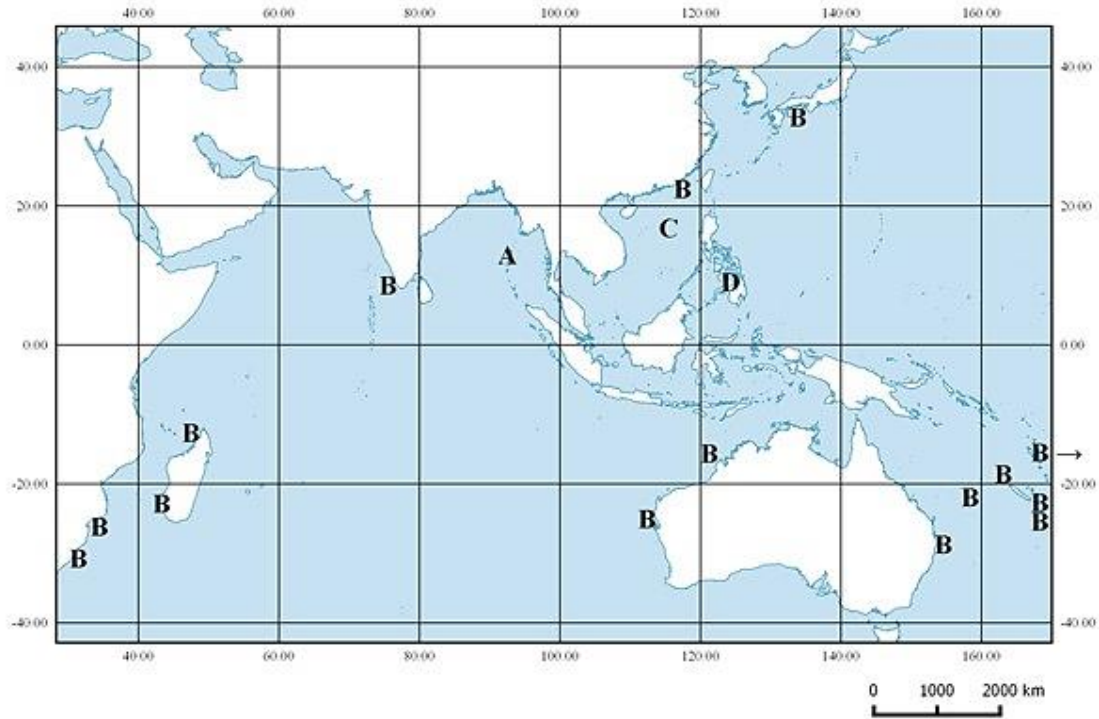


Figure 4. Geographical distribution of species of the genus *Paratriacanthodes* Fowler 1934. A. New record of *P. retrospinis*, B. Previous records of *P. retrospinis*, C. *P. abei* and D. *P. herrei*.

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