

First record of the African spadefish, *Tripterodon orbis* Playfair, 1867 (family: Ephippidae) from the north-east coast of India

PRALAYA RANJAN BEHERA, SHUBHADEEP GHOSH AND M. SATISH KUMAR

Visakhapatnam Regional Centre of Central Marine Fisheries Research Institute, Visakhapatnam-530 003, India

A single specimen of the African spadefish, Tripterodon orbis, was landed in a gill net operating off Visakhapatnam on 13 December 2013. The morphometric and meristic characters of the recorded specimen are described and discussed herein. This is the first occurrence of the species from the north-east coast of India, exhibiting an extension in distribution from the southern to the northern region, along the Bay of Bengal.

Keywords: range extension, African spadefish, *Tripterodon orbis*, Visakhapatnam

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INTRODUCTION

The family *Ephippidae*, commonly known as spadefishes, comprises eight genera (Nelson, 2006) and 15 valid species (Eschmeyer & Fong, 2014), mostly inhabiting coastal waters around reefs, up to a depth of 30 m (Nelson, 2006). The genus *Platax* is the most speciose, while the genus *Tripterodon* is monotypic (Jawad *et al.*, 2012). The maximum length attained by *Tripterodon orbis* is 750 mm (Fischer & Bianchi, 1984; Heemstra & Heemstra, 2004), with common lengths reaching 300 mm. They feed on rock and coral-dwelling organisms and their flesh is edible (Froese & Pauly, 2014).

The species had earlier been reported from the Western Indian Ocean (Somalia, Kenya, south to Algoa Bay, South Africa), from the Red sea and from the eastern Indian Ocean (Andaman and Nicobar Islands, and Sri Lanka) (Froese & Pauly, 2014). Indrasenan (1960) had also reported the occurrence of *Tripterodon orbis* from Rameswaram Island, in the Gulf of Mannar, south-east coast of India. However, this is the first occurrence of the species at Visakhapatnam along the north-east coast of India, a significant extension of its distribution from the southern to the northern region, along the Bay of Bengal.

MATERIAL AND METHODS

On 13 December 2013, one specimen (Figure 1) was collected from a gill net operating at depths between 40 and 70 m, about 20 km north of Visakhapatnam Fishing Harbour (Figure 2).

Corresponding author:

P.R. Behera

Email: beherapralaya213@gmail.com

The specimen was identified as *Tripterodon orbis* based on diagnostic characters described by Smith (1986). Measurements were taken using a digital Vernier calliper to the nearest 0.1 mm and were expressed as a percentage of the standard length (SL). The morphometric and meristic data of the recorded species were compared with the holotype (Playfair & Gunther, 1867). The identified specimen (whole fish) was initially fixed in 10% formaldehyde and later preserved in 70% ethanol, after a thorough washing. The specimen was deposited in the National Marine Biodiversity Referral Museum at the Central Marine Fisheries Research Institute, Kochi (Accession No. GB 31.60.5.6).

RESULTS AND DISCUSSION

SYSTEMATICS

Order PERCIFORMES, Bleeker, 1939

Family EPHIPPIDAE

Genus *Tripterodon* Playfair, 1867

Species *Tripterodon orbis* Playfair, 1867

MATERIAL EXAMINED

Single specimen of *Tripterodon orbis* (gill net, Visakhapatnam, water depth 40–70 m), coll. by P.R. Behera, 13 December 2013.

Fin formula: D IX, 21; P 18; V I, 5; A III, 16; C 17; L. lat. 52; L. trans. 11/28

The body is compressed and greatly elevated and the upper profile is strongly curved. The upper profile descends from the origin of the dorsal fin to the snout very abruptly, forming a rather prominent protuberance between the eyes. The greatest height of the body is below the fifth dorsal spine (60.7% SL) and the length of the head is about 26.2% of SL. The eye is



Fig. 1. African spadefish, *Tripterodon orbis* Playfair, 1867 at Visakhapatnam.

situated high up in the head, with diameter about 72.2% of the snout length and occupying 27.1% of the head length. Mouth is small, slightly protractile and terminal with thick lips. The mouth gape is small, with the upper maxillary positioned vertically from the posterior nostril. The interorbital space is concave. Top of head is without scales. There are five series of scales on the cheek. The posterior limb of the preoperculum is naked and the entire operculum is covered with scales. In the upper jaw, there are four and in the lower jaw, there are three series of large, broad, flat, moveable, tricuspid teeth.

The dorsal spines are very broad and flat, and rather feeble. The first and second dorsal spines are minute, while the third,

fourth and fifth are formed into long filaments, which are about 47.0, 18.5 and 17.2% of the head length. The sixth is equal to the diameter of the eye; the seventh and eighth are short with lengths progressively decreasing. The ninth, which is regarded as belonging to the soft portion, is shorter than the sixth. All these spines are inserted in and are received within a deep scaly sheath. The soft portion of the spines is scaly and the length of its base is greater than that of the spinous portion. The caudal fin is emarginated. The anal fin is elevated, while its edge is emarginated. The anal fin spines are short, strong and rather remote from each other. The second and third spines are nearly equal in length and their soft portion is covered with scales. The third anal ray is longer than the longest of the dorsal. Pectoral fin is obtusely pointed, and much shorter than the ventral. Ventral fin is long, the first ray being produced into a filament, which reaches to the anal. Detailed morphometric and meristic characters of the species are presented in Table 1.

The colour of the body is silvery grey, with about nine indistinct darker cross bands. The first (through the eye) and the second (from the top of the interparietal crest, passing over the superior angle of the operculum and root of the pectorals) bands are more distinct than the others. Caudal and dorsal fins are yellowish, while pelvic and anal fins are blackish.

The present record matches well with the earlier description of the same species from Oman waters (Jawad *et al.*, 2012). This species differs from *Ehippus orbis* in its body shape being more oblong, the presence of large and tricuspid teeth, its large eye diameter, measuring half the distance from mouth to eye, its scaleless head top and by the presence of nine indistinct vertical bars. It differs from species belonging to the Drepanidae family in having a short pectoral fin, a non-protrusible mouth, and long 3rd and 4th dorsal fin spines. It differs from the members of the family Scatophagidae in having three anal spines and in having a vertical head profile (Fischer & Bianchi, 1984). The morphometric and meristic characters of the specimen agree well with earlier descriptions reported by previous authors, albeit with slight

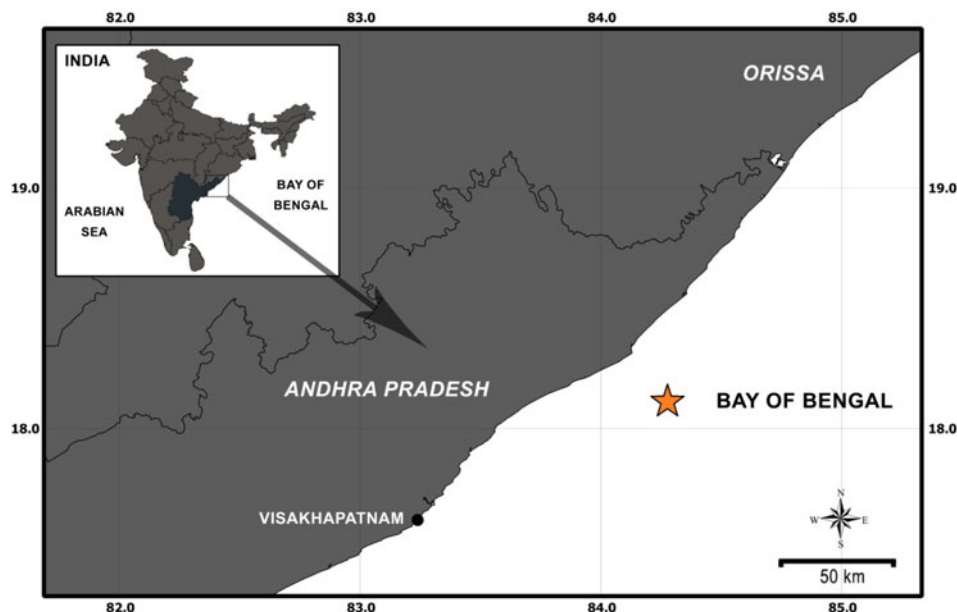


Fig. 2. Capture location (orange star) of *Tripterodon orbis* Playfair, 1867 along the north-east coast of India.

Table 1. Morphometric measurements of *Tripterodon orbis* landed at Visakhapatnam.

Morphometric characters	Specimen measurements (mm)	% of standard length
Total length	183	–
Standard length	151	–
Body depth	111	73.50
Head length	48	31.78
Eye diameter	13	8.60
Inter orbital width	16	10.59
Suborbital length	20	13.24
Snout length	18	11.92
Maxillary length	10	6.62
Length of dorsal fin base	103	68.21
Spinous dorsal fin base length	52	34.43
Soft dorsal fin base length	51	33.77
Dorsal fin spine length (1st)	2	1.32
Dorsal fin spine length (2nd)	5	3.31
Dorsal fin spine length (3rd)	71	47.01
Dorsal fin spine length (4th)	28	18.54
Dorsal fin spine length (5th)	26	17.21
Dorsal fin spine length (6th)	13	8.60
Dorsal fin spine length (7th)	7	4.63
Dorsal fin spine length (8th)	6	3.97
Dorsal fin spine length (9th)	7	4.63
Longest soft dorsal ray length	42	27.81
Length of pectoral fin	29	19.20
Length of pectoral fin base	11	7.28
Length of pelvic fin spine	42	27.81
Length of pelvic fin soft ray	52	34.43
Length of anal spine (1st)	5	3.31
Length of anal spine (2nd)	13	8.60
Length of anal spine (3rd)	13	6.62
Length of anal fin soft ray	44	29.13
Caudal peduncle length	13	8.60
Caudal peduncle height	25	16.55
Caudal fin height	72	47.68
Caudal fin length	24	15.89
Predorsal length	62	41.05
Prepectoral length	49	32.45
Prepelvic length	48	31.78
Preanal length	96	63.57
Pre orbital length	26	17.21
Post orbital length	10	6.62
Total weight (g)	230	–

variations in a few of the characters (pectoral fin count, LI scales and proportion of eye diameter to interorbital space), which could be attributed to the differing geographic locations (Table 2).

The occurrence of *T. orbis* has previously been reported from the Andaman and Nicobar Islands (Froese & Pauly, 2014) and from Rameswaram Island in the Gulf of Mannar, south-east coast of India (Indrasenan, 1960). The present occurrence from the waters of Visakhapatnam indicates a northward range extension of the distribution of the African spadefish, from the Gulf of Mannar and the Andaman and Nicobar Islands in the southern Bay of Bengal to Visakhapatnam in the northern Bay of Bengal. However, subsequent landings of the species are required for confirming their true range of extension. Similarly, an increase in the distribution range from the southern to the northern latitudes along the east and west coast of India in the last couple of

Table 2. Comparison of the morphometric and meristic characters of *Tripterodon orbis* from Visakhapatnam with the holotype. TL, total length; SN, Snout length; HL, Head length; Lat., Latitudinal; Trans., Transverse.

Characters	Playfair, 1867 (Holotype)	CMFRI GB. 31. 60. 5. 6
<i>Morphometric</i>		
Body depth (%TL)	50	60.65
Head length (%TL)	46.66	26.22
Eye diameter (%SN)	50	72.22
Eye diameter (%HL)	35	27.08
<i>Meristic characters</i>		
Dorsal fin	IX, 20	IX, 21
Anal fin	III, 16	III, 16
Pectoral fin	–	18
Ventral fin	–	I, 5
Caudal fin	–	17
LI scales (Lat.)	52	52
LI scales (Trans.)	11/28	11/28

decades has been recorded for Indian oil sardine and Indian mackerel (Vivekanandan *et al.*, 2009). A similar range extension of distribution from the south to the north region along the Bay of Bengal has previously been reported for Pacific Gregory, *Stegastes fasciolatus* (Behera *et al.*, 2014). This broadening in distribution could be attributed to the rising water temperatures along the east coast of India, which are increasing by 0.04°C each decade (Vivekanandan *et al.*, 2009). The sea surface temperature has shown a progressive increase in the Bay of Bengal since the 1950s, resulting in changes/shifts in fish communities of the area (Vivekanandan *et al.*, 2009). With gradual warming, the waters of the northern Bay of Bengal are now conducive for the survival of a wide range of species, as evident in the present study and as reported by previous authors (Vivekanandan *et al.*, 2009; Behera *et al.*, 2014).

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Correspondence should be addressed to:

P.R. Behera

Visakhapatnam Regional Centre of Central

Marine Fisheries Research Institute

Oceanview Layout, Pandurangapuram

A.U. Campus, Visakhapatnam-530 003, India

email: beherapralaya213@gmail.com