



Short Communication

New record of deep sea cusk eel *Bassozetus robustus* Smith and Radcliffe (1913) (Ophidiiformes: Ophidiidae) from the Indian EEZ with a redescription

Sherine Sonia Cubelio, Ginson Joseph, S. Venu and B. Madhusoodana Kurup

*School of Industrial Fisheries, Cochin University of Science and Technology,
Fine Arts Avenue, Cochin-682016, Kerala, India. E-mail: sherinecubelio@yahoo.co.in*

Abstract

Bassozetus robustus Smith and Radcliffe (1913), a rare species of deep sea cusk eel, which is hitherto unknown from the Indian EEZ, is reported and redescribed. *B. robustus* is compared with its closely related congeneric species, *B. multispinis* in terms of morphometrics and meristics. The specimen was collected during the cruises of FORV *Sagar Sampada* along the continental slope of the Indian EEZ. *B. robustus* can be diagnosed by the presence of one ray in each pelvic fin, one median basibranchial tooth patch and long gill rakers.

Keywords: Deep sea cusk eel, *Bassozetus robustus*

Introduction

Information on the Indian deep sea fish fauna is scarce and most of the recent information is from the fishing cruises of FORV *Sagar Sampada*. Research cruises of FORV *Sagar Sampada* have provided information on the little known deep sea fishes of the order Ophidiiformes, some of which are hitherto unknown in the Indian waters.

Ophidiids are predominant deep sea demersal fishes from the continental slope to abyssal plain (Haedrich and Merret, 1988; Merret and Haedrich, 1997). The first catalogue of Ophidiiformes was published by Cohen and Nielsen (1978), which mainly focused on genus level identification. Later, Nielsen and Cohen (1999) published another catalogue that included all Ophidiiformes fishes of the world. The synopsis of Ophidiiformes fishes in India by Alcock (1899) reported 15 genera of the family Ophidiidae. In the synopsis, the genus *Bassozetus* Gill, 1884 was described with only one species, *B. glutinosus*, which was reported from Bay of Bengal and Arabian Sea. Since then, there are no records on the occurrence of these deep sea fishes in the Indian waters. However, Smith and Radcliffe (1913) recorded *B. robustus* from Palawan Passage, Philippines. Later Shcherbachev (1980), Nielsen and

Cohen (1986, 1999) and Nielsen and Merret (2000) reported this species from different biogeographic areas. Nielson *et al.* (1999) published 48 genera and 218 species of deep sea fishes under the family Ophidiidae in which genus *Bassozetus* Gill, 1884 consisted of 10 recognized species.

Venu and Kurup (2002) identified 23 species of deep sea fishes from Indian waters, but there was no mention about *B. robustus*. Though presently not of interest to fisheries, further research is required to delineate its exact geographic distribution, biology and habitat. In this article, this little known deep sea cusk eel, which was hitherto unknown from the Indian EEZ, is reported and redescribed.

Material and methods

During Cruise 241 of FORV *Sagar Sampada*, a specimen of *B. robustus* (standard length: 280 mm; Fig. 1) was collected using HSST (High Speed Demersal Trawl) net from Station 13 (off Mangalore, 12° 118" N lat. and 74° 082" E long., Fig. 2) at a depth of 1075 m on 5-2-2006 and identified following Alcock (1899), Smith and Heemstra (1986), Nielsen and Cohen (1986, 1999) and Nielsen and Merret (2000). The specimen is deposited in the fish museum of School of Industrial Fisheries (SIF), Cochin University of Science and Technology, Cochin, India

(ID No 250/4). Morphometric measurements were taken to the nearest mm using a dial vernier caliper following Smith and Heemstra (1986). Body proportions were expressed in terms of standard length (SL: length from snout tip to the base of caudal fin) and head length (HL: length of snout tip to the posterior margin of opercle).

Measurements of *B. multispinis* were archived from Lee *et al.* (2005) and that of Taiwanese *B. robustus* from Yeh *et al.* (2005).

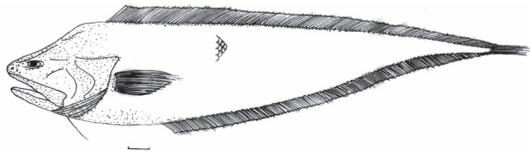


Fig. 1. Lateral view of *Bassozetus robustus* (scale indicates 1 cm)

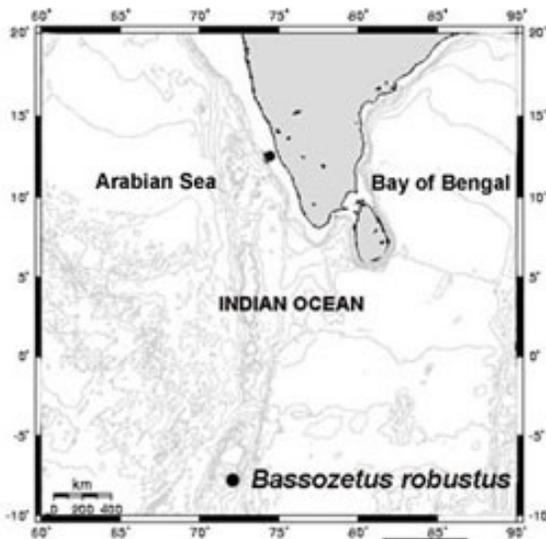


Fig. 2. Collection site of *Bassozetus robustus*

Results

B. robustus collected off Mangalore had the following characteristics:

Snout rather blunt; eye small; eye diameter shorter than snout, about 48% of snout length; mouth large and terminal; upper jaw ends behind the eye and almost double the head length. Premaxilla with two palatine and vomer teeth patches; opercular

spine weak. Preorbital length 23.2 % of head length, one median basibranchial tooth patch (Fig. 3); branchiostegal rays 8; 13 gill rakers with 9 developed rakers on anterior gill arch.

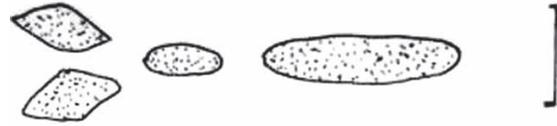


Fig. 3. Basibranchial tooth patch of *Bassozetus robustus* (scale indicates 2 mm)

Body compressed and elongated; color in formalin pale brownish; posterior third of tail, including the corresponding parts of dorsal and anal fins, black; no blotches and spots on body; body depth 25.5% of standard length; small cycloid scales covered; head length and predorsal length are more or less equal, 2.3 times of post orbital length; pelvic fin placed below preopercle and length of the rays short; each pelvic fin with one ray; pectoral fin length 3.6 times that of dorsal fin length; anal fin length more or less equal to preanal length; dorsal fin and anal fin connected with caudal fin.

Discussion

Generic diagnosis of *Bassozetus*, Gill 1884 by Nielsen and Merrett (2000) followed two diagnostic characters; the median tooth patch and length of pelvic fin. We compared with Yeh *et al.* (2005) for specimen reported from Taiwan and Lee *et al.* (2005) for closely related species *B. multispinis*.

Meristics and proportional measurements of our specimen and Taiwanese specimen of *B. robustus* and *B. multispinis* are shown in Table 1. Our specimen and *B. robustus* from Taiwan are showing more or less similar morphometric measurements. Though *B. robustus* resembles *B. multispinis* in many morphomeristic characters like pre orbital length, pectoral fin rays, pelvic fin rays, and caudal fin rays, the taxonomic identity of *B. robustus* is proved by the possession of many distinct characters such as depth at first anal base, dorsal fin base, anal fin base, upper jaw length, dorsal fin rays, eye length, developed gill rakers and anal fin rays from its congeneric species.

Table 1. Meristic counts and proportional morphometric measurements of *B. robustus* and *B. multispinis*

Characters	Morphometrics		
	Present specimen	Two specimen of <i>B. multispinis</i>	<i>B. robustus</i> (Taiwan)
Standard length (mm)	280	90-203	164
Body depth (% SL)	25.5	NA	NA
Depth at first anal base (% SL)	21.3	10-19	7.5
Depth at first dorsal base (% SL)	23.2	NA	NA
Depth at anus (% SL)	21	NA	NA
Predorsal length (% SL)	28.1	16-28.5	NA
Preanal length (% SL)	49	31-41.5	NA
Dorsal fin base (% SL)	67.4	NA	84.3
Pectoral fin length (% SL)	18.7	NA	NA
Pelvic fin length (% SL)	10.7	10.7	16.5-20.5 (6.6 +) NA
Anal fin base (% SL)	49.0	NA	69.7
Upper jaw length (% SL)	15.7	9.7-13.5	9.5
Head length (HL)	29	18-24.5	NA
Preorbital length (% HL)	23.2	NA	24.5
Postorbital length (% HL)	69.0	NA	NA
Eye length (% HL)	11	NA	7.9
Meristics			
Branchiostegal rays	8	NA	NA
Gill rakers	13	11-16	NA
Developed gill rakers	9	NA	17
Dorsal fin rays	102	112-130	127
Pectoral fin rays	23	24-28	23
Pelvic fin rays	1	1	1
Anal fin rays	93	92-103	112
Caudal fin rays	7	7-10	8
Scale rows at anus and dorsal fin	35	NA	NA

NA: Not available, Source: *B. robustus* (Taiwan): Yeh et al. (2005), *B. multispinis*: Lee et al. (2005)

Nielsen and Merrett (2000) suggested that the morphometric character of pelvic fin shows negative allometric growth in the genus *Bassozetus*. Our specimen agrees with this. The proportion of pelvic fin length was smaller (10.7 mm) in the present specimen compared to that of *B. multispinis* (16.5-20.5 mm) even though the length of our specimen was greater (SL: 280mm) than that of *B. multispinis* (SL: 90-203 mm), thus showing a negative allometric growth. This is the first report on *B. robustus* from the Indian EEZ. We also considered that the allopatric distribution of similar species of *Bassozetus* can be used to identify our specimen. Moreover, the ongoing phylogenetic studies are expected to confirm species identification of these little known deep sea fishes.

Acknowledgement

The authors are thankful to the Director, School of Industrial Fisheries, CUSAT, Cochin-16, for

providing facilities for the work. The financial assistance for the research project on "Resource assessment and biology of deep sea fishes along the continental slope of Indian EEZ" from Ministry of Earth Sciences (MoES), Govt. of India is thankfully acknowledged.

References

- Alcock, A. W. 1899. A descriptive catalogue of the Indian deep-sea fishes in the Indian Museum. *International Science Publisher, USA*, 87 pp.
- Cohen, D. M. and J. G. Nielsen. 1978. Guide to the identification of genera of the fish order Ophidiiformes with a tentative classification of the order. *NOAA Tech. Rep. NMFS Circ.*, 417: 1-72.
- Haedrich, R. L. and N. R. Merrett. 1988. Summary atlas of deep-living demersal fishes in the North Atlantic Basin. *J. Natl. Hist.*, 22: 1325-1362.
- Lee, M. Y., D. A. Lee and H. M. Chen. 2005. New records of deep-sea cusk eels, *Dicrolene tristis* and *Bassozetus*

- multispinis* (Ophidiiformes: Ophidiidae) from Taiwan. *J. Mar. Sci. Tech.*, 13(2):112-115.
- Merrett, N. R. and R. L. Haedrich. 1997. *Deep Sea Demersal Fish and Fisheries*. Chapman & Hall, London, 282 pp.
- Nielsen, J. G. and D. M. Cohen. 1986. *Ophidiidae*. In: Smith M. M. and P. C. Heemstra (Eds.), *Smith's Sea Fishes*, Springer-Verlag, Berlin, p. 345-350.
- Nielsen, J. G. and D. M. Cohen. 1999. *Ophidiidae*. Ophidiiform fishes of the world (Order: Ophidiiformes). In: Nielsen, J. G., D. M. Cohen, D. F. Markle and C. R. Robins (Eds.), An annotated and illustrated catalogue of pearlfishes, cusk-eels, brotulas and other ophidiiform fishes known to date, Rome. *FAO Fisheries Synopsis No.* 125, 18:178 pp.
- Nielsen, J. G., D. M. Cohen, D. F. Markle, and C. R. Robins. 1999. FAO Species catalogue: *Ophidiiform Fishes of the World* (Order: Ophidiiformes), FAO, Rome, 18: p. 55-62.
- Nielsen, J. G. and N. R. Merrett. 2000. "Revision of the cosmopolitan Deep sea genus *Bassozetus* (Pisces: Ophidiidae) with two new species" *Galathea Rep.*, 18: 7-56.
- Shcherbachev, Y. N. 1980. Preliminary review of deep sea ophidiids of Indian Ocean. *Trudy Inst. Okeand. Akad. Nauk.*, 110: 105-176 (in Russian with English abstract).
- Smith, H. M. and L. Radcliffe. 1913. Descriptions of seven new genera and thirty-one new species of fishes of the families Brotulidae and Carapidae from the Philippine Islands and the Dutch East Indies. *Proceedings of US National Museum*, 44: p.135-176.
- Smith, M. M. and P. C. Heemstra. 1986. Order Scyliorhinidae. *Smith's Sea Fishes*, 89, Springer-Verlag, New York. 1047 pp.
- Venu, S. and B. M. Kurup. 2002. Distribution and abundance of deep sea fishes along the west coast of India. *Fish. Tech.*, 39 (1): 20-26.
- Yeh, M., Mao-Ying and Kwang Tsao Shao. 2005. Fifteen Taiwanese new records of Ophidiid fishes (Pisces: Ophidiidae) collected from the deep waters by R V *Ocean Researcher 1*. *J. Fish. Soc. Taiwan.*, 32(3): 279-299.

Received : 19/08/08

Accepted : 04/04/09