First record of black spot bandfish: Acanthocepola limbata (Valenciennes, 1835) from Northern Bay of Bengal

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Research Article

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Abstract

Acanthocepola limbata (Valenciennes, 1835) is reported for the first time from Northern Bay of Bengalon the basis of specimens collected from Petuaghat fish landing, West Bengal coast and this species reported from Karnataka, Maharastra, Kerala, west coast of India and Gulf of Mannar, east coast of India. In this manuscript, details on the morphological characters have been provided and discussed with all the reported species in the genus found in India.

Introduction

The fishes in family Cepolidae is commonly known as band fish or snake fish characterized by elongated, laterally compressed band like body covered with cycloid scales (Jordan & Fowler, 1903).The family Cepolidae comprises 3 genera with 45 species have been reported around the world (Froese &Pauly, 2022). Bandfishes are commonly found in Northwest Pacific: central Honshu, Japan southward to Taiwan and also Western Central Pacific ocean (Smith-Vaniz, W. F., 2001). In India, so far six species of Cepolidae have been reported namely *Acanthocepola limbata*, *Owstonia simoterus*, *Acanthocepola indica*, *Cepola macrophthalma, Acanthocepola abbreviata* and *Owstonia kamoharai*, (Manoj Kumar and Pavithran, 2011; Venu, 2009; Pradhan & Mahapatra, 2018; Nair & Geetha, 2018; Kulkarni & Balasubramanian, 1978; Oxona et al., 2020). This family cepolidae was firstly reviewed by Jordan and Fowler (1903) from Japan, recognizing three species, *Cepola schlegelii*, *A. krusensternii* and *A. limbata* (Jordan & Fowler, 1903). In India, the species *Acanthocepola limbata* was first reported from Karwar, Karnataka, followed by, Maharashtra coast, Kerala Coast and at the east coast it was reported from Gulf of Mannar (Kulkarni & Balasubramanian, 1978; Joshi et al., 2014; Manoj Kumar, Pavithran 2011 & Mogalekar et al., 2018). All of these previous reports from west coast of India and southern Bay of Bengal, and through this communication *Acanthocepola limbata* (Valenciennes, 1835) reported from Northern Bay of Bengal for the first time by the specimen collected from the Petuaghat fish landing, East Medinipur, West Bengal.

Material Methods

One medium sized specimen of *Acanthocepola limbata* (Valenciennes, 1835) was collected from trawl catches of a fishing boat at Petuaghat fish landing, West Bengal (21°47'41.33"N, 87°52'55.22"E) on 7th October 2021 along with other bony fishes (Fig. 1). Freshly collected specimens photographed at the field, then fixed using 10% formalin and then preserved in 70% ethanol for long term preservation. The preserved specimens are deposited in the National Zoological Collections of the Zoological Survey of India, Sunderban Regional Centre, Canning, West Bengal. Morphological characters and diagnostic features were followed from Smith's Sea Fishes and a review of the Cepolidae or band-fishes of Japan (Smith & Heemstra, 1986; Jordan & Fowler, 1903). Classification of the species is followed from Catalogue of Fishes (Fricke et al., 2022). All the morphological measurements of the fish have been taken by using electronic calipers.

Result

The systematic details of *Acanthocepola limbata* (Valenciennes, 1835) is given below:

Class : Actinopterygii Klein, 1885

Order : Perciformes Bleeker, 1863

Family : Cepolidae Rafinesque 1815

Subfamily : Cepolinae Rafinesque 1815

Genus : *Acanthocepola* Bleeker, 1874

***Acanthocepola limbata* (Valenciennes, 1835)**

1835. *Cepola limbata* Valenciennes [A.] in Cuvier &Valenciennes Histoire naturelle des poissonsV.10:402 (Japan). No types preserved.

1984. *Acanthocepola limbata* (Valenciennes 1835). Araga in Masuda *et al.*The fishes of the Japanese Archipelago.Tokyo (Tokai University Press).i-xxii + 1-437

Common Name: Blackspot bandfish.

Conservation Status: Not Evaluated (IUCN Red List 3).

Economic Importance: These fishes are used mainly for the preparation of fish cake (Joshi *et al.*, 2014).

Material examined: ZSI/SbRC/KN5872, 1 ex., TL 259 mm, SL 235 mm, Petuaghat fish landing, 21°47'41.33"N, 87°52'55.22"E, 07.10.2021, Coll: J.S. Yogesh Kumar.

Diagnostic Characters: Dorsal fin soft rays 102; anal fin soft rays 106; pectoral fin soft rays 19; pelvic fin soft rays 6 and caudal fin with 10 soft rays; first gill with 54 gill rakers, 100 gill filaments (Fig. 2D) and vertebrae 12+65 (Fig. 2E). The morphometric characteristics and meristic measurements of *Acanthocepola limbata* (Valenciennes, 1835) is given in the Table 1.

Body elongated, ribbon like, gradually tapering, with a continuous dorsal fin and anal fin confluent with caudal fin. Body covered with equally dispersed medium sized cycloid scales. Head and operclesare covered with minute cycloid scales. Snout short and blunt, its length less than the eye diameter. Eyes are large with golden-red colored outer border. Outer portion of the opercles are lined with soft thin membranous layer; pre-opercles with 5 blunt end spine. Mouth large, terminal and directed upward; pointed teeth, projecting outward from lower jaw. Doral fin is stared from the head before the gill opening; anal fin is started from just after the pectoral fin origin. Pelvic fins are originated from just below the inclination point of the operculum; first ray of the pelvic fin is maximum in length, distally with small

thread like appearance. Pectoral fin light orange reddish in color with a very thin dark red band at the base.

In fresh condition, fines and body reddish colored; body with light golden yellow vertical bars (Fig. 2A). Dorsal and anal fins are pinkish in color; outer portion of anal fin with white and dark brown longitudinal row; dorsal fin with a dark reddish-black oval shaped spot between 8^{th} to 14^{th} rays (Fig. 2C). After preservation in 70% ethanol the body color changed into light grayish but the dark brown coloration of distal part of the anal fin is present in the preserved specimens (Fig. 2B).

Distribution: India - Karnataka, Maharashtra, Kerala, west coast of India & Tamil Nadu (Kulkarni & Balasubramanian, 1978; Joshi*et al*., 2014; Manoj Kumar, Pavithran 2011 & Mogalekar *et al*., 2018); Elsewhere - Taiwan, Thailand, Australia, Maldives, Philippines, East China, Japan and Gulf of Papua (GBIF, 2022).

Discussion

Deep sea snake fish or cepolids are also known as bandfish due to their band like appearance. In India only six species of cepolids are reported so far (Manoj Kumar and Pavithran, 2011; Venu, 2009; Pradhan &Mahapatra, 2018; Nair & Geetha, 2018; Kulkarni & Balasubramanian, 1978; Oxona et al., 2020; Mogalekar, 2018). *A. limbata* is reported from west coast and south east coast of India (Kulkarni & Balasubramanian, 1978; Joshi et al., 2014; Manoj Kumar, Pavithran 2011 & Mogalekar et al., 2018). In the east coast it was reported from Gulf of Mannar but it is questionable as the checklist by Mogalekar et al., 2018 cited a reference in the support of the occurrence of *A. limbata* but when verifying the original literature, it was pointed out that the cepolidae mentioned in the original reference was *A. abbreviata* (Ramaiyanet al., 1986). The habitat of the Gulf of Mannar suitable for *A. limbata* but more studies should be carried out to verify its presence from the area. Due to the questionable occurrence from Gulf of Mannar area, it has not been mentioned in the distribution map of *A.limbata* (Fig. 1). *Acanthocepola indica* Day, 1888 which is sometimes misidentified as *Acanthocepola limbata* (Valenciennes, 1835), can be distinguish by number of dorsal fin soft rays (102–104 in *A.limbata* vs. 83–88 in the *A. indica*); presence of dark reddish-black oval shaped spot between 8th to 14th rays in *A. limbata* but 7th to 11th rays in *A. indica.* Whereas another species *Acanthocepola abbreviate* (Valenciennes, 1835) differ from *A. limbata* by lacking of black spot on the dorsal fin as well as by the count of dorsal fin rays, (67–74 vs. 102–104) (Pradhan &Mahapatra, 2018; Mahesh et al., 2019).

Less number of studies has been made on them as they can get caught by only the bottom trawl net due to their burrowing nature and preference towards sand or muddy bottom areas with a water column depth of 15 to 100 meters (Masuda et al., 1984; Allen & Erdmann, 2012).This species is reported from west coast of India and southern Bay of Bengal. Hence, an attempt has been made through this paper to confirm the presence of *A. limbata* from the northern Bay of Bengal, which also makes an addition to the marine ichthyofaunal diversity of West Bengal.

Declarations

Ethics approval and Consent to participate

Consent and approval was obtained from the Zoological Survey of India, Sunderban Regional Centre, Canning, WB, India for conducting a survey to collect, preserve & identify faunal specimens for better knowledge of the diversity, as well as preparation of the ichthyofaunal catalogue of the state of West Bengal following the mandate of Zoological Survey of India.

Human and Animal Ethics

All procedures involving animals were in compliance with the Zoological Survey of India animal ethical standards, and approval was granted by the Zoological Survey of India, Sunderban Regional Centre, Canning, WB, India.

Consent for publication

Informed consent was obtained from all individual participants included in the study for publication of the data.

Availability of supporting data

The identified specimen mentioned in the publication is deposited at the National Zoological Collection of Sunderban Regional Center, Zoological Survey of India (Reg No - ZSI/SbRC/KN5872) and is available on request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

Author JSYK collected the specimen, confirmed the identification, prepared final proof of manuscript for submission, and guided overall work. Author PP identified and prepared the draft manuscript. Author AS assisted during survey, preservation, photography of the specimen and formatted the manuscript.

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Table

Table 1: Morphometric measurements of the collected specimens

Characters	Measurements (mm)
Total Length (TL)	259
Standard Length (SL)	235
Head Length (HL)	35.4
Eye Diameter	12.1
Inter Orbital Length	8.9
Snout Length	7.5
Pectoral Fin Length	21.2
Pelvic Fin length	25.3
Anal Fin Length	15.1
Pre-dorsal Length	33.3
Pre-anal Length	47.2
Pre-pectoral Length	38.9
Pre-pelvic Length	32.4
Body Width	31
Upper Jaw Length	13.8
Caudal Fin Length	24.2

Figures

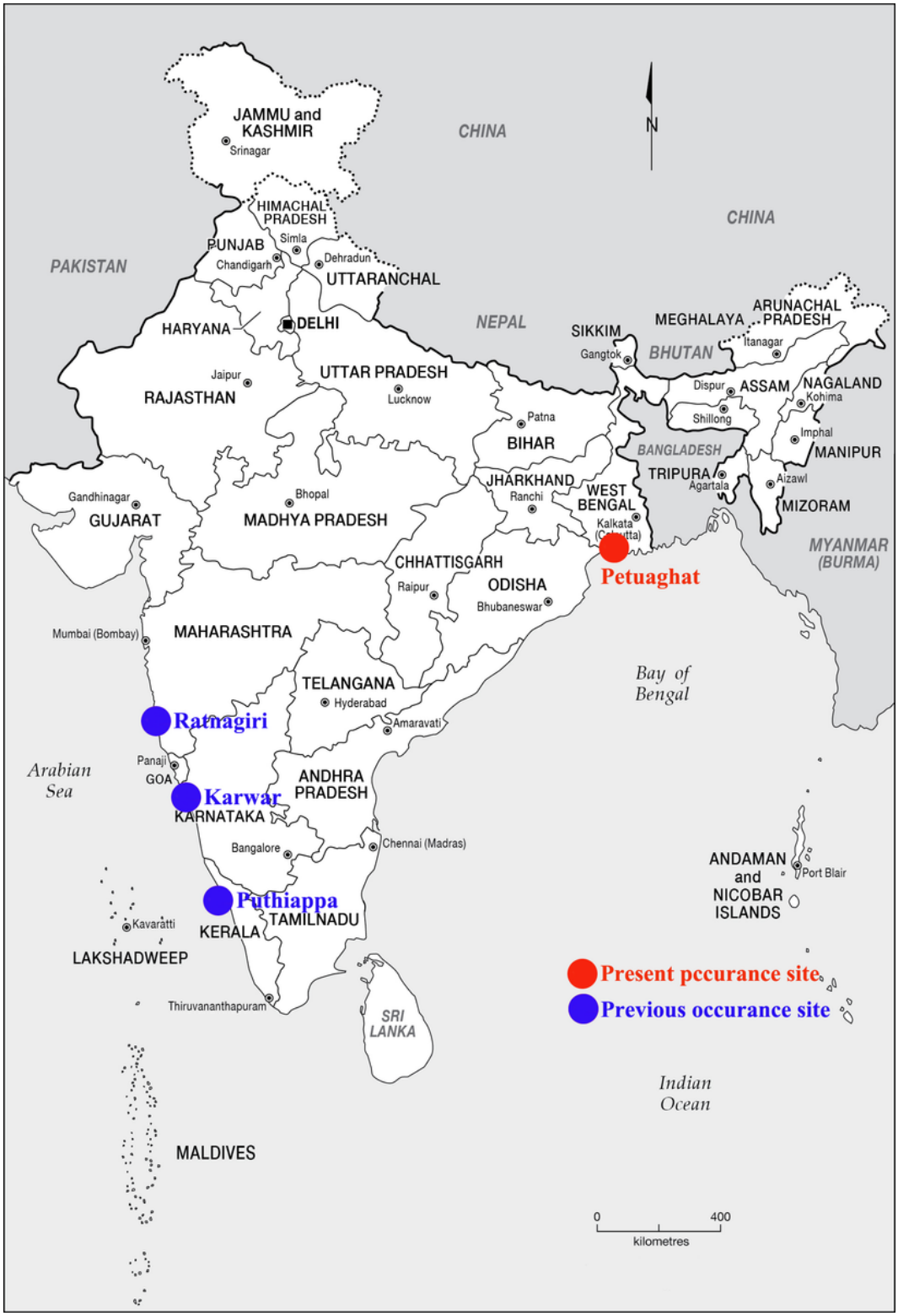

Figure 1

Map showing the collection site of *Acanthocepola limbata* (Valenciennes, 1835), from Petuaghat Fish landing, West Bengal and other reporting sites throughout the India.

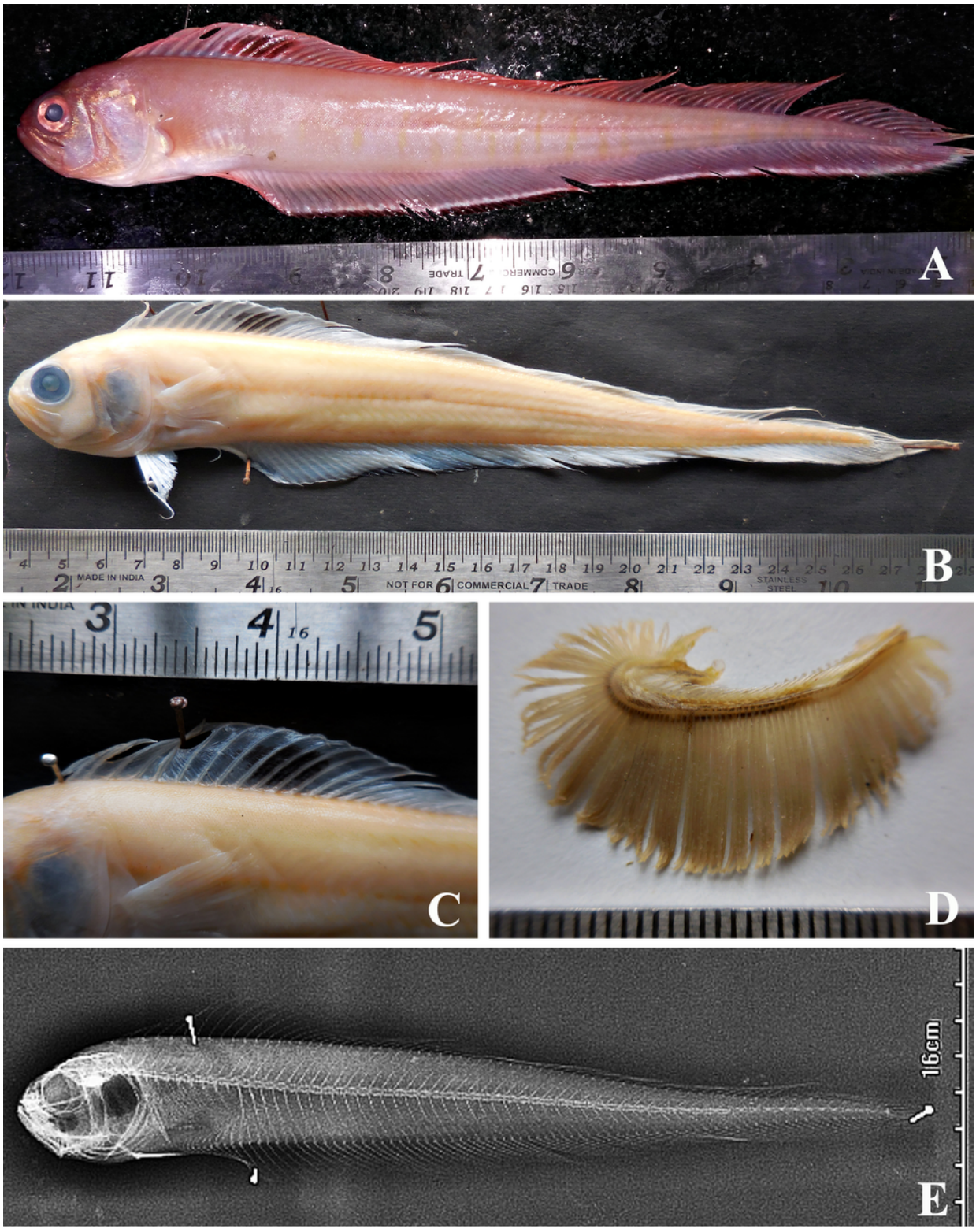

Figure 2

Acanthocepola limbata (Valenciennes, 1835): A – Freshly collected specimen, B – Preserved specimen, C – Dorsal fin showing the black spot, D – Gill raker of the preserved specimen& E- X-ray plate.