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Research Article

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

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Abstract

Based on a specimen obtained from the Petuaghat fish landing on the West Bengal coast, *Acanthocepola limbata* (Valenciennes, 1835) is described here for the first time from the Northern Bay of Bengal. There is only one record of this species from the Gulf of Mannar, which is also on India's southeast coast. This species had previously been reported from Karnataka, Maharashtra, and Kerala, which are mostly on the west coast of India. Although *Acanthocepola indica* has been found in the research area, the presence of *A. limbata* indicates that the Cepolidae fish family is less well known than other fish families. This species is mainly regarded as trash fish and is not seen in significant quantities along any of the coasts of India. The morphological traits of A are the topic of this message. The morphological characteristics of *A. limbata* from Petuaghat is recorded in this communication, which compares them to all previously described specimens of *A. limbata* from each place of occurrence in India.

Keywords: *Acanthocepola*, Cepolidae, Bay of Bengal, New record, West Bengal

Introduction

The fishes of the family Cepolidae are known as the "band or snakefishes" due to their laterally compressed and elongated bodies, which resemble a band–like appearance and are covered in cycloid scales (Jordan & Fowler, 1903). The family Cepolidae comprises three genera and 45 species that are distributed worldwide (Froese & Pauly, 2022). Globally, band fishes are mostly observed from the Northwest Pacific: central Honshu, Japan southward to Taiwan, and the Western Central Pacific Ocean (Smith–Vaniz, 2001). Although from India, six species of Cepolids have so far been identified, including *A. limbata*, *Owstonia simoterus*, *A. indica*, *Cepola macrophthalma, A. abbreviate*, and *O. kamoharai* (Manojkumar & Pavithran, 2011; Venu & Madhusoodana, 2009; Pradhan & Mahapatra, 2018; Nair & Geetha, 2018; Kulkarni & Balasubramanian, 1978; Oxona *et al.*, 2020; Joshi *et al.*, 2014; Mogalekar *et al.*, 2018). Cepolidaes were reviewed by Jordan and Fowler (1903), who recognised three species, *Cepola schlegelii, A. krusensternii,* and *A. limbata* from Japan for the first time (Jordan & Fowler, 1903). The species *A. limbata* was originally discovered in India, but its original whereabouts are unknown (Fricke *et al.*, 2022). Later, it was identified in Karwar, Karnataka, and then it was discovered along the coasts of Maharashtra and Kerala on the western coastline and only the

Gulf of Mannar on the eastern coast (Kulkarni & Balasubramanian, 1978; Joshi *et al.*, 2014; Manojkumar & Pavithran, 2011; Mogalekar *et al.*, 2018). All of these earlier reports came from the west coast of India and the southern Bay of Bengal, but the specimen from the Petuaghat fish landing in East Medinipur, West Bengal, used in this communication marks the first time the species *A. limbata* (Valenciennes, 1835) has been reported from the northern Bay of Bengal.

Materials and Methods

On October 7, 2021, a medium–sized specimen of *A. limbata* (Valenciennes, 1835) and other bony fishes were taken from a fishing boat's trawl catch in Petuaghat fish landing, West Bengal (21°47'41.33"N, 87°52'55.22"E) (Fig. 1). In the field, freshly obtained specimens were photographed, treated with 10% formalin, and then preserved in 70% ethanol for long–term storage in museums. The preserved specimens were deposited at the National Zoological Collections of the Zoological Survey of India, Sunderban Regional Centre, India. Morphological characters and diagnostic features were taken from Smith's Sea Fishes and a review of the Cepolidae, or band–fishes, of Japan for identification of the collected specimen (Smith & Heemstra, 1986; Jordan & Fowler, 1903). The e–Catalogue of Fishes is used to guide the classification of the species (Fricke *et al.*, 2022). All the morphological measurements of the collected specimen have been taken using electronic calipers.

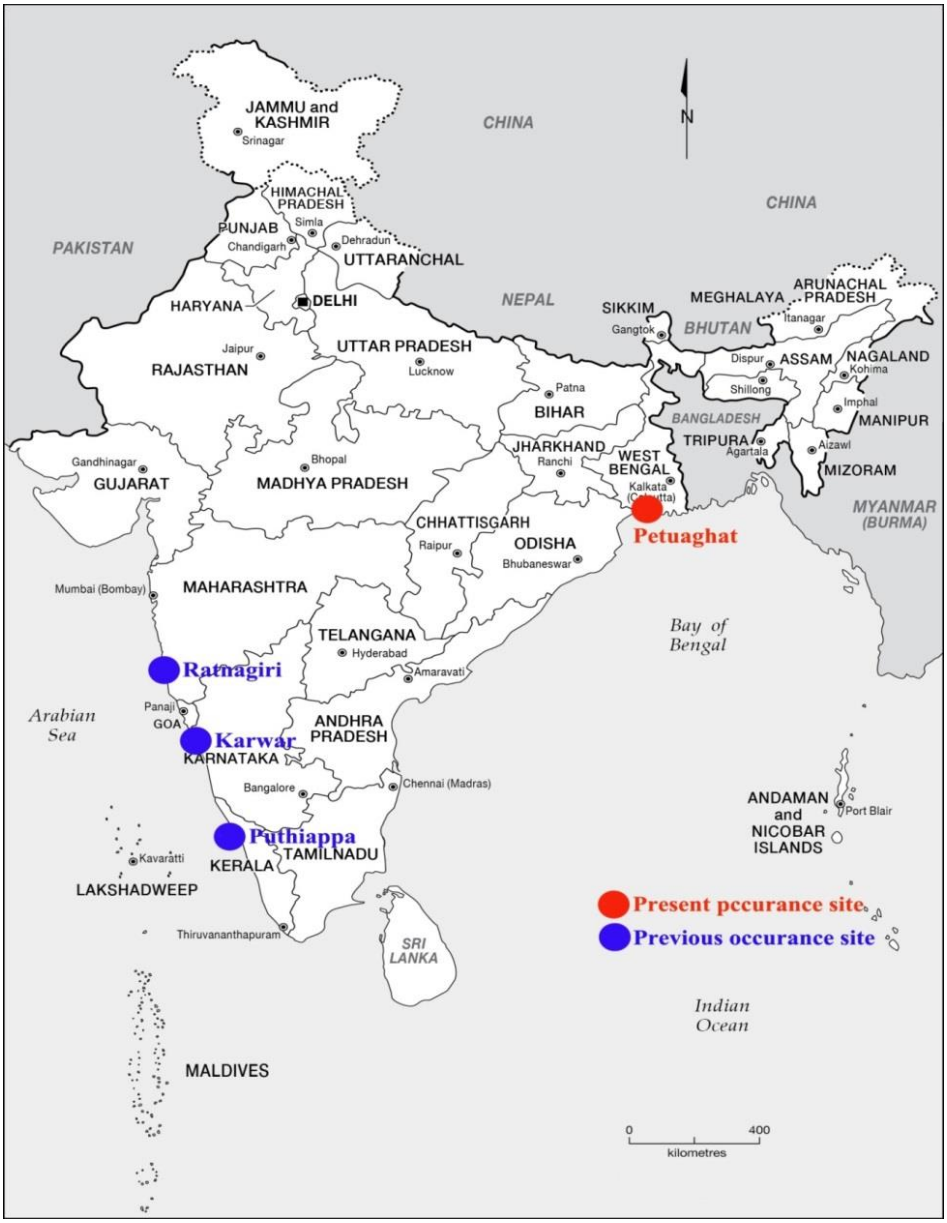

Figure 1. Map showing the collection site of *Acanthocepola limbata* (Valenciennes, 1835), from Petuaghat Fishlanding, West Bengal, and other reporting sites throughout India.

Results

One specimen belonging to genus *Acanthocepola* was caught by commercial bottom trawl in Petuaghat fish landing. Based on morphological characters and diagnostic the specimens was identified as *Acanthocepola limbata*.

Material examined. One specimen, Petuaghat fish landing, West Bengal, India (21°47'41.33"N, 87°52'55.22"E), 07.10.2021, Collector: J.S. Yogesh Kumar, Accession Number: ZSI/SbRC/KN5872 (Deposited in the National Zoological Collections of ZSI–Sunderban Regional Centre).

The collected sample was identified as *Acanthocepola limbata* (Valenciennes, 1835) and the details are given below:

Class: Actinopterygii Klein, 1885

Order: Perciformes Bleeker, 1863

Family: Cepolidae Rafinesque 1815

Subfamil: 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).

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: Black spot band fish.

Conservation Status: NE (2023).

Economic Importance: These fishes are used mainly for the preparation of fish cakes (Joshi *et al.*, 2014). Some of the local people also use this fish for dry fish preparation.

Description.

Meristic. Dorsal fin soft rays 102; Anal fin soft rays 106; Pectoral fin soft rays 19; Pelvic fin soft rays 6; Caudal fin with 10 soft rays; first gill with 54 gill rakers, 100 gill filaments (Fig. 2D); vertebrae 12+65 (Fig. 2E). The morphometric characteristics and meristic measurements of *A. limbata* (Valenciennes, 1835) is given in Table 1.

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

Body shape and color. The body is elongated, looks like a ribbon, and taper at both ends. The caudal fin is connected with the dorsal and anal fins. Scales on the body are cycloid and are evenly spaced throughout. The opercula and overhead scales are essentially smaller than the body. presence of a short, blunt–ended snout. Eye diameter is less than snout length. presence of large, rounded eyes with an outer rim of golden–red color. A soft, thin layer of membrane along the outer opercle edges. Over the

pre–opercle region, there are five blunt spines. The mouth is large and positioned terminally, with an upward direction, extending outward from the lower jaw. Dorsal fin originates from the head just prior to the gill opening. Anal fin origin is immediately before the pectoral fin origin. Pelvic fins are originated from right below the inclination point of the operculum. First pelvic fin ray is the largest in length and with a reddish tint at the distal end. Pectoral fins are orange to light reddish in color and a thin dark red band is present around the base.

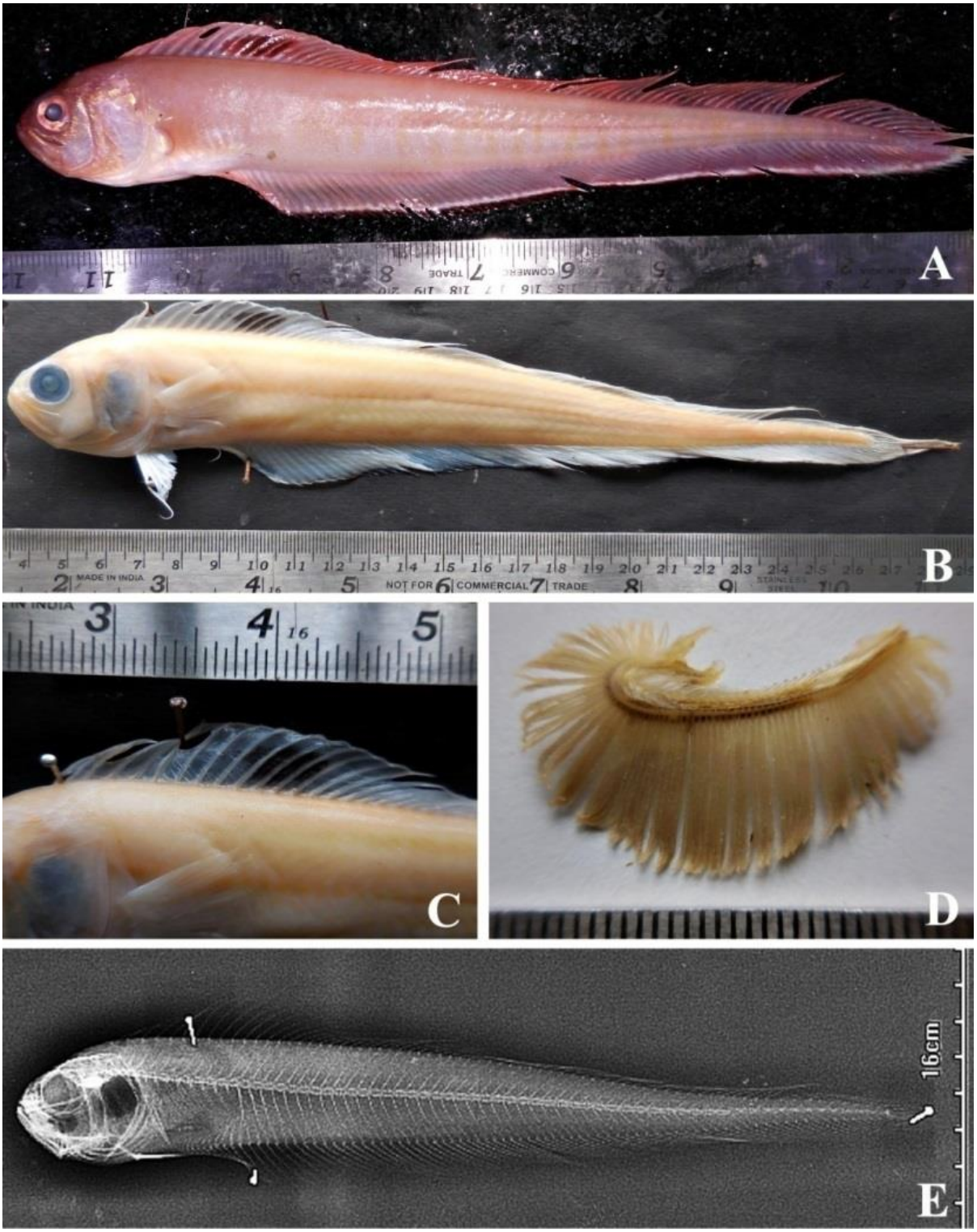

Figure 2. *Acanthocepola limbata* (Valenciennes, 1835): A – Freshly collected specimen, B – Preserved specimen, C – Dorsal fin showing the black spot, D – Gill raker of the preserved specimen& E– X–ray plate

The fresh specimen has a reddish body with vertical streaks of bright golden yellow color (Fig. 2A). The dorsal and anal fins are pinkish, and the dorsal fin has a dark reddish–black oval patch between the eighth and fourteenth rays. The anal fin's outer portion has a white and dark brown longitudinal row (Fig. 2C). The body color changed to a light greyish tint after preservation in 70% ethanol, but the preserved specimens still had the dark brown color on the distal region of the anal fin (Fig. 2B).

Distribution. India – Karnataka, Maharashtra, Kerala, west coast of India & Tamil Nadu (Kulkarni & Balasubramanian, 1978, Joshi *et al.*, 2014, Manojkumar & Pavithran, 2011, Mogalekar *et al.*, 2018); Elsewhere – Taiwan, Thailand, Australia, Maldives, Philippines, East China, Japan and Gulf of Papua (GBIF, 2021).

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 and *A. limbata* is reported mostly from west coast whereas only one record is there from the south east coast of India. It was recorded from the Gulf of Mannar on the south–east coast, but that is also debatable because the checklist by Mogalekar *et al.* (2018) used a reference to establish the existence of *A. limbata*, but it was later discovered that the cepolidae listed in the original reference was *A. abbreviate* (Ramaiyan *et al.*, 1986). Although the habitat of the Gulf of Mannar can support for the existance for *A. limbata* but more studies should be carried out to verify its presence in the area. Due to the ambiguous occurrence from Gulf of Mannar area, it has not been mentioned in the distribution map of *A. limbata* (Fig 1). *A. indica* Day, 1888, which is sometimes misidentified as *A. limbata* (Valenciennes, 1835), can be distinguished by the 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 *A. abbreviata* (Valenciennes, 1835) differs from *A. limbata* by the absence of the black spot on the dorsal fin as well as by the count of dorsal fin rays, (67–74 vs. 102–104) (Mahesh *et al.*, 2019; Pradhan & Mahapatra, 2018).

Cepolids are bottom–dwelling fish that have received little research since only bottom trawl nets can capture them. They are difficult for researchers to study because of their burrowing behaviour and affinity for sand or muddy bottom locations with a water column depth of 15 to 100 metres (Masuda *et al.*, 1984, Allen & Erdmann, 2012). As a result, an effort has been made in this work to verify the existence of *A. limbata* from the northern Bay of Bengal, which also makes an addition to the marine ichthyofaunal diversity of West Bengal.

Author Contributions: Author J.S.Y.K. collected the specimen, confirmed the identification, prepared final proof of manuscript for submission, and guided overall work. Author P.P. identified and prepared the draft manuscript. Author A.S. assisted during survey, preservation, photography & identification of the specimen and edited & formatted the manuscript.

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Data Availability Statement: The data underlying this article will be shared upon reasonable request to the corresponding author. The data that support the findings of this study are openly available in National Zoological Collection at Zoological Survey of India, Sunderban Regional Centre, Canning – 743329, WB, India, reference number ZSI/SbRC/KN5872. All the materials used in study are available in National Zoological Collection of Zoological Survey of India and are available on request.

Conflicts of Interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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