Indian Journal of Geo Marine Sciences
Vol. 54 (04), April 2025, pp. 213-216
DOI: 10.56042/ijms.v54i04.15885

Short Communication

Occurrence of three ornamental butterflyfishes (Acanthuriformes: Chaetodontidae) from the West Bengal coast, India

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Received December 20, 2024; revised 04 March 2025

The present study reports three ornamental butterflyfishes, namely, *Chaetodon lineolatus* Cuvier, 1831; *Heniochus singularis* Smith & Radcliffe, 1911; and *Roa jayakari* (Norman, 1939), for the first time from the West Bengal coast, India. The presence of these species in non-reef areas suggests the need for research into their habitat preferences in West Bengal's exclusive economic zone.

[**Keywords**: Ichthyofauna, New record, Ornamental fishes, Reef-associated]

Introduction

The fishes of the family Chaetodontidae, under the order Acanthuriformes, are commonly called butterflyfishes, globally represent 137 species under 12 genera[1]. They are mostly distributed in coral reefs across tropical and subtropical waters, but are mainly concentrated in the Indo-Pacific region[2,3]. Due to their bright colouration, like other coral reef fishes, they are very popular in the marine ornamental fish industry and also do well in captivity[4]. Most butterflyfishes feed on coral polyps; thus, the abundance and distribution of chaetodontids should be directly correlated with the abundance and distribution of coral reefs, thereby acting as an indicator of coral's health[5,6]. There are about 5 genera and 38 species of the family reported to occur along the coasts of India[7]. West Bengal, being a maritime state, its coastal waters are known to harbour four species of butterflyfishes till date, *viz*., *Chaetodon auriga* Forsska, 1775; *Chaetodon collare* Bloch, 1778; *Chaetodon decussatus* Cuvier, 1829; and *Heniochus acuminatus* (Linnaeus, 1758)[8-10]; however, except *Heniochus acuminatus* (Linnaeus, 1758), the other three species need to be verified with material support. During the survey of ichthyofauna from the northern east coast of India, three more species of fishes of the family Chaetodontidae were collected and confirmed their distribution along the West Bengal coast, namely, *Chaetodon lineolatus* Cuvier, 1831; *Heniochus singularis* Smith & Radcliffe, 1911; and *Roa jayakari* (Norman, 1939). The present study also confirms the occurrence of *Chaetodon decussatus* Cuvier, 1829, along the West Bengal coast, with material support.

Materials and Methods

All the specimens were collected from different fish landing stations of the West Bengal coast during a local survey. The collected specimens were usually known to have been captured by bottom trawl nets from the Exclusive Economic Zone off West Bengal state. Identification, measurement and counting were carried out following Kuiter[3]. Photographs were taken in fresh condition. After correct determination, the specimens were preserved in 10 % formalin. The preserved specimens are deposited in the museum collections of the Estuarine Biology Regional Centre (EBRC), Zoological Survey of India (ZSI), Gopalpur, Odisha. Abbreviations used are: D – Dorsal fin; A – Anal fin; P – Pectoral fin; V – Pelvic fin; LL – Lateral Line scales; GR – Gill Rakers; SL – Standard Length; HL- Head Length.

Results

***Chaetodon lineolatus* Cuvier, 1831: Lined butterflyfish**

Material examined: EBRC/ZSI/F 15561, 1 specimen, 162 mm SL, Digha Mohona, 15.02.2023, Coll. Dipanjan Ray (Fig. 1).

Diagnostic characters: D: XII, 26; A: III, 21; P: 16; V: 5. Body deep, compressed; ctenoid scales covered head, body and median fins. Dorsal and ventral profiles of the body equally convex. Body depth 60.71 % of SL. Head profile concave above eye, its length 32.14 % of SL. Interobital space 32.64 % of HL; snout long and narrow, its length 42.31 % of HL; eye diameter smaller than snout, eye diameter 23.14 % of HL. Dorsal fin origin below the eye, predorsal

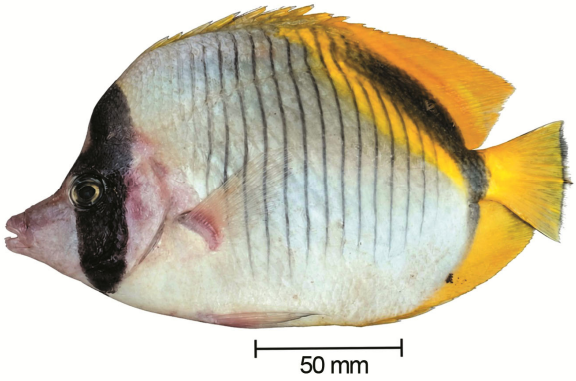

Fig. 1 — *Chaetodon lineolatus* Cuvier, 1831: Lined butterflyfish

length 43.18 % of SL; preanal length 65.47 % of SL. Pectoral fin cannot reach the anal fin origin, pelvic fin tip reaches just before the anal fin origin. Caudal fin rounded.

Colour: Body white with 18 vertical, narrow black lines. A dark band runs from above the dorsal fin origin through the eye to the front above the eye. Another black elliptical marking runs from the base of the soft dorsal fin through the caudal peduncle to the posterior anal rays. Dorsal, anal and caudal fins are bright yellow; pectoral and pelvic fins are transparent and whitish.

Distribution: Indo-Pacific: Red Sea and East Africa to the Hawaiian, Marquesan, and Ducie islands, north to southern Japan, south to the Great Barrier Reef and Lord Howe Island. Throughout Micronesia[14]. In the Indian coastal waters, this species is reported from Tamil Nadu[12], Lakshadweep[15], and the Andaman and Nicobar Island[16]. Present paper reports this species from the West Bengal coast.

***Heniochus singularis* Smith & Radcliffe, 1911: Singular bannerfish**

Material examined: EBRC/ZSI/F 15559, 1 specimen, 165 mm SL, Petuaghat, 08.02.2023, Coll. Dipanjan Ray (Fig. 2).

Diagnostic characters: D. XII, 26; A. III, 18; P. 16; V. I, 5. Body deep, compressed and slightly triangular, covered with cycloid scales. Body depth 62.02 % of SL. Head profile concave, its length 31.28 % of SL. Two bony projections, one on supraorbital and another on nape. Interorbital space 29.45 % of HL; snout short and pointed, its length 31.96 % of HL; eye diameter 25.72 % of HL. Dorsal fin origin well behind eye, predorsal length 69.93 % of SL, 4th dorsal spine filamentous; preanal length % of 73 % of SL, caudal fin rounded.

Colour: Body silvery white with 4 dark bands, the 1st band narrow, encircles the mouth and extends

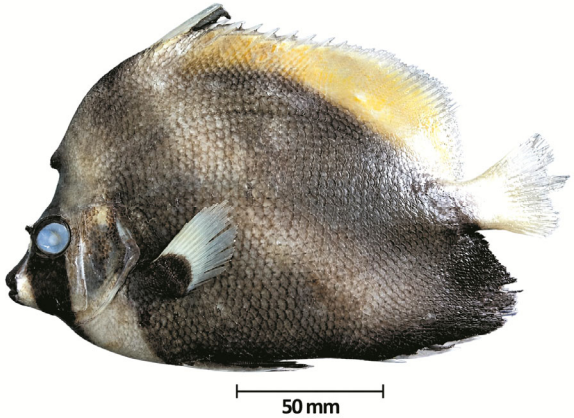

Fig. 2 — *Heniochus singularis* Smith & Radcliffe, 1911: Singular bannerfish

backwards to snout; 2nd band wider than first one, encircle the supraorbital, eye and undersurface of head; 3rd band runs from first 3 dorsal spines to anal fin origin; and the last band runs from 6th to 10th dorsal spine base to lower part of anal fin. Pelvic, anal and base of pectoral fins black. From the 5th dorsal spine to end of dorsal fin, caudal fin and upper part of pectoral fin yellow.

Distribution: Andaman Islands to Samoa, Japan, Rowley Shoals and New Caledonia[14]. From Indian waters, this species is reported from the Andaman Nicobar Island[16], Tamil Nadu[12], Goa[17], and Lakshadweep[18].

***Roa jayakari* (Norman, 1939): Indian golden-barred butterflyfish**

Material examined: EBRC/ZSI/F15558, 2 specimens, 68 – 72 mm SL, Petuaghat, 08.02.2023, Coll. Dipanjan Ray (Fig. 3).

Diagnostic characters: D: XI, 22; A: III, 18; P: 15; V: I, 5. Body very compressed, disc-shaped with large ctenoid scales covered on head and body, smaller scales at snout. Body depth 68.65 – 72.70 % in SL. Head concave, its length 43.42 – 44.56 % of SL. Interorbital space narrow, 23.20 – 24.11 % of HL; snout moderately long, 26.75 – 31.93 % of HL; eye diameter 28.80 – 32.42 % in HL. Dorsal fin origin above the posterior part of head, predorsal 46.65 – 49.65 % in SL; anal fin origin vertically just above the soft part of dorsal fin, pre-anal 70.94 – 71.48 % in SL; pectoral and pelvic fin tips extend up to anal fin origin; caudal fin truncate.

Colour: Body with 3 vertical dark brown bands having a golden tinge, alternating with whitish inter spaces. The 1st band is narrow and extends from anterior tip of dorsal fin along the eye to below the

Fig. 3 — *Roa jayakari* (Norman, 1939): Indian golden-barred butterflyfish

lower jaw; 2nd band broadest and extends from 3rd to 5th dorsal spines to the abdomen between pelvic fin edge to the upper part of anal fin; third band runs below the last three dorsal spines towards caudal peduncle and reach up to 1st soft ray of anal fin. All fin spines are white in colour; caudal fin transparent with pale yellow colour; pectoral fin rays are dusky; pelvic fin is blackish in colour. A round, black ocellus, which is larger than eye diameter, is present between the 2 – 7 soft dorsal rays.

Distribution: Roa jayakari (Norman, 1939) distribution ranges from the Red Sea, Gulf of Aden, Gulf of Oman, southern Arabian coast, and the west coast of India. From Indian waters, this species is reported from Odisha, Visakhapatnam coast, Andhra Pradesh, Gulf of Mannar, Tamil Nadu, Kerala[11-12] and Maharashtra (Aravindakshan, 1980 as *Chaetodon jayakeri*)[13]. Present paper reports this species from the West Bengal coast and confirms its occurrence throughout the east coast of India.

Discussion

The marine ornamental fishes beautify aquariums of different sizes and types due to their attractive behaviour, marvellous and bright colour patterns, and peculiar body parts, which attract viewers for their aesthetic value. Butterflyfishes have all the characteristics that indicate they are ideal and most important marine ornamental fishes for the aquarium industry, along with damselfishes and angelfishes[19].

Butterflyfishes are mainly inhabitants of coral reef environments. The frequent occurrence of *Heniochus acuminatus* and *H. singularis*, and the documented incidence of the other three species reported in this paper, show the need for further extensive study on their distribution and habitat preferences, as the locality does not have a coral reef nearby.

Chaetodon decussatus was reported from the Indo-West Pacific: Yemen and Oman, Sri Lanka and Maldives, Andaman Sea east to Indonesia, the Philippines; and also from the Christmas Island. From the Indian coast, this species is reported from Kerala, Tamil Nadu, Puducherry, Odisha[7] and Lakshadweep[15]. Mahapatra *et al.*[10], did not include this species from the West Bengal coast; later, Mahapatra & Lakra[9] reported this species without material verification. The current study provides the first material evidence of *C. decussatus* from the West Bengal coast.

Some species of butterflyfishes and other marine ornamental fishes are frequently found in Digha Mohana, Petua Ghat and Shankarpur fishing harbour of West Bengal[8,20-23], but due to the low market value and lack of awareness of the local fishermen, these fish species are normally thrown as bycatch in the trash and not valued at all in the fish market. But these fishes have a high market value in live marine ornamental fish trading. Thus, the present study demands increased awareness among fishery associations, local fishermen, the fishing community, and the general public about the importance of butterflyfishes and other ornamental fishes. Also, infrastructure such as shore-based storage facilities in the harbour or fish landing centre, and transportation facilities for live fish trading, may be facilitated for promoting the ornamental fish industries as an alternate livelihood for the fishermen of the areas.

Members of the family Chaetodontidae are among the main marine ornamental fishes, having high market value, and they play a vital role in maintaining the coral reef ecosystem, facing threats from climate change, habitat degradation and bad fishing practices. In this regard, sufficient attention should be paid to their captive breeding practices, as well as to sustainable fishing practices, habitat protection, and to find out the impacts of climate change to secure the long-term health of butterflyfishes and their associated ecosystems. This is the first-ever report of three species, namely *Chaetodon lineolatus* Cuvier, 1831; *Heniochus singularis* Smith & Radcliffe, 1911; and *Roa jayakari* (Norman, 1939), from the West Bengal coast. Incidence of these species, which are usually coral reef–associated, demands a need for further extensive study on their distribution and habitat preferences, as there is no coral reef surrounding the West Bengal coast.

Acknowledgments

We are thankful to Dr. Dhriti Banerjee, Director, Zoological Survey of India for providing necessary working facilities.

Conflict of Interest

We declare that there is no conflict of Interest.

Ethical Statement

Fishes were collected in dead condition from the fisherman.

Author Contributions

DRa, DRo, TK & BS: Collection, Preservation, Identification, and manuscript preparation; DRa, SSM & AM: Identification, Conceptualisation and manuscript preparation.

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