Brief Communication

Rare records of reef-associated fishes from the West Bengal coast

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Surgeonfishes (family Acanthuridae) and angelfishes (family Pomacanthidae) are primarily associated with coral reefs and rocky habitats in tropical and subtropical seas. Although many species have wide geographic distributions, their occurrence outside reef environments is relatively infrequent and is seldom documented from turbid, soft-bottom coastal regions. The northern Bay of Bengal is characterised by strong riverine influence, high turbidity, and predominantly sandy-silty substrates, conditions that differ markedly from typical reef habitats (Shetye *et al*., 1996; Michels *et al*., 2003). As a result, reef-associated fishes are rarely encountered in routine fishery landings along the West Bengal coast, and available records from this region remain sparse. When such taxa are encountered, reliable identification is essential, as several species exhibit close morphological similarity with congeners and undergo marked ontogenetic colour changes that may lead to misidentification (Randall, 2001; Allen *et al*., 1998). During examination of commercial trawl landings from the West Bengal coast, three reef-associated species: *Acanthurus xanthopterus* Valenciennes, 1835, *Acanthurus bariene* Lesson, 1831, and *Pomacanthus annularis* (Bloch, 1787) were recorded. The present account provides detailed morphometric and meristic data, diagnostic characters, and colour descriptions based on fresh material. These records represent rare occurrences from a non-reef, turbid coastal environment in the northern Bay of Bengal and contribute additional verified distributional information for the ichthyofauna of the region.

Taxonomic notes

Morphometric measurements and meristic counts were recorded following standard ichthyological methods (Hubbs *et al*., 2004). Identification of surgeonfishes (*Acanthurus spp*.) was based on diagnostic characters, including body proportions, caudal-peduncle spine morphology, and fin-ray counts, following published taxonomic descriptions (Randall, 2001; Heemstra *et al*., 2022). Identification of the angelfish (*Pomacanthus* sp.) was confirmed using body shape, fin configuration, and opercular spine characters as described in standard taxonomic literature (Allen *et al*., 1998; Heemstra *et al*., 2022). The specimens were collected from commercial trawl landings at Digha Mohana (21°36'58.33" N; 87°29'56.86" E), West Bengal, during the post-fishing-ban period (2024–2025) (Fig.1). The fishes were caught in coastal waters at depths of approximately 25–30 m. Morphometric measurements were expressed as percentages of standard length (SL). Immediately after collection, specimens were preserved in crushed ice and transported to the Fish Biology Laboratory, Digha Regional Station of ICAR–

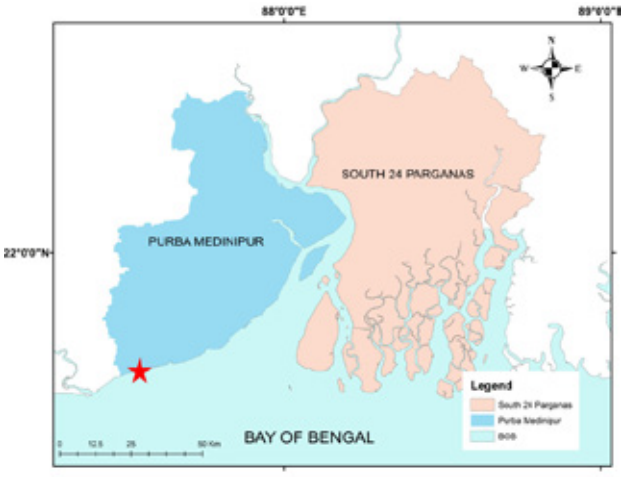

Fig. 1. Map showing the sampling location (red star) of three reef-associated fish species from the West Bengal coast

CMFRI, for detailed taxonomic examination. Fresh specimens were photographed prior to preservation to document coloration and pigmentation. Meristic counts were recorded using magnification where necessary. Proportional morphometric measurements and meristic counts are presented in Table 1.

Table 1. Proportional measurement of *A. xanthopterus, A. bariene,* and *P. annularis* expressed as a percentage of standard length

Morphometric measurements	*A. xanthopterus* n = 1	*A. bariene* n = 1	*P. annularis* n = 1
Standard length (mm)	262	293	302
Head length	26.9	24.9	26.0
Pre-orbital length	17.2	16.2	9.4
Post-orbital length	5.5	4.8	12.3
Eye Diameter	5.0	5.2	5.2
Snout Length	18.0	16.4	9.1
Sub-orbital depth	17.5	17.7	7.5
Inter Orbital Width	8.9	8.4	8.9
Upper jaw length	6.7	6.3	7.6
Predorsal length	28.4	20.7	27.5
Preanal length	46.3	40.9	60.3
Prepelvic length	30.1	24.6	29.6
Pre-Pectoral length	23.9	19.9	24.6
Pectoral fin length	27.8	25.0	27.6
Pelvic spine length	11.1	11.9	13.9
Pelvic Fin length	21.0	24.5	31.0
Dorsal-fin base	67.6	71.1	69.5
Second dorsal-fin spine	8.5	6.8	5.2
Last dorsal-fin spine	15.0	13.4	16.2

Longest dorsal-fin soft ray	17.6	17.7	66.3
Anal fin base length	50.5	47.7	43.6
Second anal-fin spine	11.1	7.8	12.6
Third anal-fin spine	11.6	9.1	16.3
Longest anal-fin soft ray	17.6	15.1	18.8
Caudal-peduncle length	10.5	9.1	6.7
Caudal-peduncle depth	11.7	11.0	13.4
Caudal-fin length	39.5	44.0	17.8
Caudal concavity	19.7	24.3	0.0
Caudal-spine length	5.8	8.1	0.0
Groove in front of eye length	5.2	7.5	0.0
Body Depth	49.3	45.8	69.2
Body width	13.5	13.2	13.1
Opercular spine length	-	-	13.6
Meristic counts			
Dorsal Fin Rays	IX, 27	VIII, 27	XIII, 22
Pectoral Fin Rays	17	17	18
Anal Fin Rays	III, 24	III, 25	III, 22
Principal Caudal Fin Rays	16	16	16
Pelvic Fin Rays	I, 5	I, 5	I, 5
Anterior gill-rakers	6	8	5
Posterior gill-rakers	11	14	13
Total gill-rakers	17	22	18
Upper jaw Teeth	20	20	-
Lower jaw teeth	19	20	-

Acanthurus xanthopterus Valenciennes, 1835

Yellowfin surgeonfish (Fig. 2)
Order: Acanthuriformes (surgeonfishes)
Family: Acanthuridae (surgeonfishes)

Material examined: 1 ex., 262 mm SL, Digha Mohana (21°36' 58.3272"N 87°29' 56.8644"E), West Bengal, trawl, 25–30 m, sandy silt, 11 July 2024.

Distinctive Characters: Dorsal-fin rays IX,27; anal-fin rays III,24; pectoral-fin rays 17; pelvic-fin rays I,5; principal caudal fin rays 16; gill rakers 17 in total, comprising 6 on the upper limb and 11 on the lower limb of the first gill arch; mouth with 20 teeth in upper jaw and 19 in lower jaw. Body moderately deep, body depth contained about 2.0 times in standard length, and covered with minute scales. Dorsal profile of head convex. Mouth small, with a single row of fixed, closely arranged, spatulate teeth with denticulate margins on both jaws (Fig. 2a). Caudal-peduncle spine small, its length contained about 4.7 times in head length. Caudal fin deeply emarginated, caudal concavity contained about 5.1 times in standard length. Stomach gizzard-like.

Colour: Body bluish grey. A broad yellow band present anterior to the eye, extending irregularly posteriorly to the lower margin of the eye. Dorsal and anal fins with a blue-grey band along the base, followed by four to five alternating longitudinal bands of pale blue and dull yellow. Distal one-third of pectoral fins yellow. Caudal fin bluish grey, with a whitish transverse band at the base of the caudal peduncle. Caudal-peduncle spine socket edged with yellow and surrounded by a broad blue area. Pelvic fins with rays distinctly darker, appearing brown, and membranes bluish.

Fig. 2. *Acanthurus xanthopterus*, 262 mm SL, fresh, Digha Mohana, West Bengal

Fig. 2a. *Acanthurus xanthopterus* showing spatulate teeth with denticulate margins on both upper and lower jaws

Acanthurus bariene Lesson, 1831

Roundspot surgeonfish (Fig. 3)

Material examined: 1 ex., 293 mm SL, Digha Mohana (21°36' 58.3272"N 87°29' 56.8644"E), West Bengal, trawl, 25–30 m, sandy silt, 11 July 2024.

Distinctive Characters: Dorsal-fin rays VIII,27; anal-fin rays III,25; pectoral-fin rays 17; pelvic-fin rays I,5; principal caudal fin rays 16; gill rakers 22 in total, comprising 8 on the upper limb and 14 on the lower limb of the first gill arch; mouth with 20 teeth each in upper and lower jaw. Body moderately deep, body depth contained about 2.2 times in standard length, covered with minute scales. Forehead strongly convex. Mouth small, bearing a single row of fixed, closely set, spatulate teeth with denticulate margins on both jaws (Fig. 3a). Caudal-peduncle spine well developed, its length about 3.1 times in head length. Caudal fin lunate, caudal concavity contained about 4.1 times in standard length. Stomach gizzard-like.

Colour: Body marked with alternating, irregular longitudinal bands of orange-brown and pale blue. Head yellowish brown, ornamented with small orange-yellow spots and irregular markings on the cheeks. A rounded black spot, edged with blue and measuring nearly two-thirds of the eye diameter, present just posterior to the eye, followed by a diffuse orange-yellow vertical bar. Margin of gill opening black; mouth white. Caudal-peduncle spine socket edged with black. Dorsal and anal fins predominantly yellow, each with a bright blue line along the base and a blue marginal band with a few blue lines near the fin edge. Caudal-fin lobes orange-yellow, shading outwardly to pale blue, with the central portion of the fin dark brown, and a white band at caudal-fin base. Pectoral fin blackish blue, becoming yellowish over the upper two-thirds. Pelvic fin blackish, grading to yellowish near the base.

Fig. 3. *A. bariene*, 293 mm SL, fresh, Digha Mohana, West Bengal

Fig. 3a. *A. bariene* showing spatulate teeth with denticulate margins on both upper and and lower jaws

Pomacanthus annularis (Bloch, 1787)

Blue-ring angelfish (Fig. 4)
Order: Acanthuriformes (surgeonfishes)
Family: Pomacanthidae (Angelfishes)

Material examined: 1 ex., 302 mm SL, 1432 g TW, Digha Mohana (21°36' 58.3272"N 87°29' 56.8644"E), West Bengal, trawl, 25–30 m, sandy silt, 11 July 2025.

Distinctive Characters: Dorsal-fin rays XIII,22; anal-fin rays III,22; pectoral-fin rays 18; pelvic-fin rays I,5; caudal fin rays 16; gill rakers 18 in total, comprising 5 on the upper limb and 13 on the lower limb of the first gill arch. Body oblong, very deep and laterally compressed, body depth contained about 1.4 times in standard length; a prominent spine presents at the angle of the preopercle, the preopercular spine distinctly grooved; soft portions of dorsal and anal fins round; caudal fin rounded; mouth small, furnished with numerous, well-developed, elongate needle-like tooth bands on both jaws (Fig. 4a); body and head covered with ctenoid scales.

Colour: Head and body yellowish brown, marked with several bright blue, curved bands radiating from the pectoral-fin base and extending onto the soft dorsal and anal fins and the caudal peduncle region. A conspicuous blue ring present above the upper margin of the opercle. Head with two horizontal blue stripes, the upper stripe passing through the mid-eye level and the lower stripe positioned just below the eye. Tip of dorsal fin elongated and yellowish. Pectoral fins yellow. Pelvic fins with rays distinctly darker, appearing orange to brown, with transparent membranes. Caudal fin white, edged with a yellow margin.

Fig. 4. *Pomacanthus annularis* (Bloch, 1787), 302 mm SL, fresh, Digha Mohana, West Bengal.

Fig. 4a. Close-up views of jaw dentition: Pomacanthus annularis exhibiting numerous, well-developed, elongate needle-like tooth bands on both jaws.

Remarks

The Yellowfin surgeonfish *Acanthurus xanthopterus* exhibits pronounced ontogenetic colour changes, which increase the likelihood of misidentification. It is most often confused with *A. mata* (Cuvier, 1829) and *A. dussumiere* Valenciennes, 1835, but can be distinguished by the presence of four longitudinal blue bands and a blue-grey band at the base of the dorsal and anal fins and the yellow colour of the outer one-third of the pectoral fin (Randall, 2001; De Bruin *et al*., 1995). The Roundspot surgeonfish *Acanthurus bariene* closely resembles *A. dussumiere* but is readily separated from congeners by a distinct, round black spot immediately posterior to the eye, which constitutes its most reliable diagnostic character (Randall, 2001). The Blue-ring angelfish *Pomacanthus annularis* is most frequently confused with the emperor Angelfish *P. imperator* (Bloch, 1787); however, it is clearly distinguished by the conspicuous blue ring above the opercle and curved blue bands radiating from the pectoral-fin base (Heemstra *et al*., 2022). The marked juvenile-to-adult colour transformation observed in both species further contributes to frequent confusion.

Conclusion

The occurrence of *Acanthurus xanthopterus, A. bariene,* and *Pomacanthus annularis* along the West Bengal coast represents rare and noteworthy records, as these taxa are typically associated with coral reef and rocky habitats. Their capture from highly turbid, soft-bottom environments of the northern Bay of Bengal at depths of 25–30 m through commercial trawling is likely incidental and may reflect post-larval dispersal, ontogenetic or seasonal movements, or displacement driven by prevailing oceanographic conditions. Although each species was represented by a single specimen, such records constitute valuable additions to regional ichthyofaunal inventories and underscore the ecological connectivity between reef and adjacent non-reef coastal ecosystems. The present findings highlight the importance of fishery-dependent monitoring in documenting uncommon or extralimital occurrences and provide baseline data that improve understanding of species distributions, habitat use, and biogeographic patterns along the West Bengal coast and the wider Bay of Bengal.

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References

Allen, G.R., *et al*., 1998. *A Guide to Angel fishes and Butterflyfishes.* Odyssey Publishing, Perth, 250p.

De Bruin, G.H.P., *et al*., 1995. *FAO species identification field guide for fishery purposes. The marine fishery resources of Sri Lanka.* FAO, Rome, 400 pp.

Heemstra, P. C., *et al*., 2022. *Coastal fishes of the Western Indian Ocean, Volume 1–5.* South African Institute for Aquatic Biodiversity, Makhanda, South Africa.

Randall, J. E. 2001. *Surgeonfishes of the World*. Mutual Publishing, Honolulu.