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First occurrence report of three rare Serranid fishes from northern part of east coast of India and a new record from West Bengal coast, India

Dipanjan Ray^{1*}, Sanmitra Roy², Anil Mohapatra³

ABSTRACT

The present study reports the first distributional record of three species of percoid fishes belonging to family Serranidae from northern part of east coast of India. This study also describes the first-time report of Tomato grouper from West Bengal coast. Diagnosis, morphometric measurements, meristic characters of the recorded species are provided herein along with the comparison of distinguishing features with other similar species of the family.

Keywords: Grouper, Soap fish, New record, Northern east coast, India.

1. INTRODUCTION

The groupers, soapfishes or seabasses belong to a fish clade with families like Anthiadidae, Epinephelidae and Serranidae. They are a large group of predatory percoid fishes in an undisturbed tropical marine ecosystem, having importance in fisheries for food, sport and aquaculture (Rimmer and Glamuzina, 2019; Akhilesh et al., 2021). The group consists of nearly 601 species in 73 genera, occurring in all oceans, but most species are distributed in tropical and subtropical waters (Parenti and Randall, 2020; Fricke et al., 2022). All the members of this clade were previously described in different subfamilies of the family Serranidae, but recent studies on molecular systematics of this group along with morphological variations made the subfamilies to be treated as separate families (Smith and Craig, 2007). Thus, a total of five families viz. Anthiadidae, Epinephelidae, Grammistidae, Liopropomatidae and Serranidae are now in existence with the highest diversity in family Anthiadidae with 248 species (41% of total), followed by Epinephelidae with a species count of 175 (Fricke et al., 2022).

From Indian water, a total of 95 species under 22 genera were reported, accounting for nearly 16% of 601 known serranids and epinephelids of the world (Akhilesh et al., 2021). The marine fish diversity along West Bengal coast of India has been earlier studied by several workers but only three species of genus *Epinephelus* Bloch, 1793 were encountered (Yennawar et al., 2011). Recently, ten more species of groupers were reported by Ray and Mohapatra, (2020). But none

of these studies have reported the four species of grouper which are mentioned in this paper. Hence the authors intended to report them from the coastal waters of West Bengal state as well as northern part of east coast of India along with providing the morpho-meristic characteristics of these four species.

2. MATERIALS AND METHODS

During the normal field surveys and fish faunal collection at different fish landing centres of East Medinipur coast of West Bengal state, India, the groupers and the soapfish were collected. After collection, the specimens were preserved in 10% formaldehyde. The detailed morphometric measurements were taken after bringing the samples to the laboratory. All measurements were made with aid of digital caliper and measuring tape. The count of the fin rays and lateral line scales were carried out by Leica S9i digital stereo microscope. Taxonomic classification follows Fischer and Bianchi, (1984); Nelson, (2006). Morphometric characters and meristic counts of the reported fishes are presented in Table 1. Abbreviation: D: Dorsal fin, A: Anal fin, P: Pectoral fin, V: Ventral fin, GR: Gill rakers, LL: Lateral line scales. The identified fishes were deposited at the National Repository of Estuarine Biology Regional Centre, Zoological Survey of India.

Table 1 Comparison of morphological characters of four groupers collected along West Bengal coast.

Characters	<i>Cromileptes altivelis</i> (Valenciennes, 1828) EBRC/ZSI/F 12837			<i>Cephalopholis sonnerati</i> (Valenciennes, 1828) EBRC/ZSI/F 13618			<i>Epinephelus epistictus</i> (Temminck & Schlegel, 1842) EBRC/ZSI/F 13091			<i>Pogonoperca ocellata</i> (Günther, 1859) EBRC/ZSI/F 12836		
	mm	% SL	% HL	mm	% SL	% HL	mm	% SL	% HL	mm	% SL	% HL
Total Length	559.7			280–295			107.1			251.0		
Standard Length (SL)	490.0			230.2–240			87.6			213.0		
Body depth at dorsal fin origin	242.2	49.4		77.4–80.9	33.6–33.7		31.1	35.5		81.1	38.1	
Body depth at anal fin origin	237.3	48.4		68.9–70.2	29.3–29.9		24.5	28.0		77.0	36.2	
Body width	80.5	16.4		37.4–34.9	14.5–16.3		11.3	12.9		31.0	14.6	
Length of soft dorsal fin base	139.0	28.4		54.5–56.7	23.6–23.7		14.9	17.0		41.2	19.3	
Length of Anal fin base	78.0	15.9		43.6–43.4	18.1–18.9		13.8	15.8		58.0	27.2	
Head Length (HL)	177.3	36.2		86.2–87.1	36.3–37.5		42.9	49.0		81.2	38.1	
Pectoral Fin length	106.6	21.8	60.1	48.2–54.4	20.9–22.7	55.9–62.5	22.5	25.7	52.4	45.3	21.3	55.8
Pelvic Fin length	77.2	15.8	43.5	46.3–53.1	20.1–22.1	53.7–61.0	18.3	20.9	42.7	45.0	21.1	55.4
Caudal Fin length	87.4	17.8	49.3	46.7–51.2	20.3–21.3	54.2–58.8	19.5	22.3	45.5	39.2	18.4	48.3
Snout length	35.5	7.2	20.0	14.8–18.1	6.4–7.5	17.2–20.8	6.4	7.3	14.9	27.3	12.8	33.6
Inter-orbital length	29.2	6.0	16.5	12.5–12.1	5.1–5.4	13.9–14.5	4.8	5.5	11.2	11.2	5.3	13.8
Post-orbital length	119.2	24.3	67.2	49.1–55.1	21.3–22.9	57.0–63.3	23.6	26.9	55.0	43.4	20.4	53.4
Eye Diameter	24.1	4.9	13.6	13.6–14.5	5.9–6.0	15.8–16.6	9.1	10.4	21.2	14.3	6.7	17.6
Maxilla (upper jaw) length	62.3	12.7	35.1	42.4–44.6	18.4–18.6	49.2–51.2	18.1	20.7	42.2	34.1	16.0	42.0
Mandible (lower jaw) length	56.1	11.4	31.6	25.3–27.7	11.0–11.5	29.4–31.8	16.4	18.7	38.2	31.2	14.6	38.4
Caudal Peduncle length	78.9	16.1	44.5	35.7–37.9	15.5–15.8	41.4–43.5	12	13.7	28.0	37.2	17.5	45.8
Caudal Peduncle depth	66.3	13.5	37.4	30.1–33.3	13.1–13.9	34.9–38.2	9.3	10.6	21.7	30.1	14.1	37.1

3. RESULTS

Cromileptes altivelis (Valenciennes, 1828)

Humpback Grouper or Panther Fish

Material examined

EBRC/ZSI/F 12837, 01 ex., 490 mm SL, Digha fish landing centre, Purba Medinipur, West Bengal, Ray and party, 28/iii/2018.

Diagnostic characters

D: X+19; A: III+10; P: 16; V: I+5; C: 17; GR: 11; LL: 61. Medium size grouper with quite compressed and deep body; highly concave dorsal profile of head followed by straight portion up to posterior part of eyes and after that steeply rises to dorsal fin origin, upper part of snout flat. Mouth oblique, lower jaw larger than upper jaw; villiform teeth present on jaws in bands. Eyes small, preorbital narrow; preopercular angle serrated and operculum with two flat spines. A vertical slit present on posterior nostril. Dorsal fin started over the opercle, caudal and pectoral fin rounded (Figure 1).

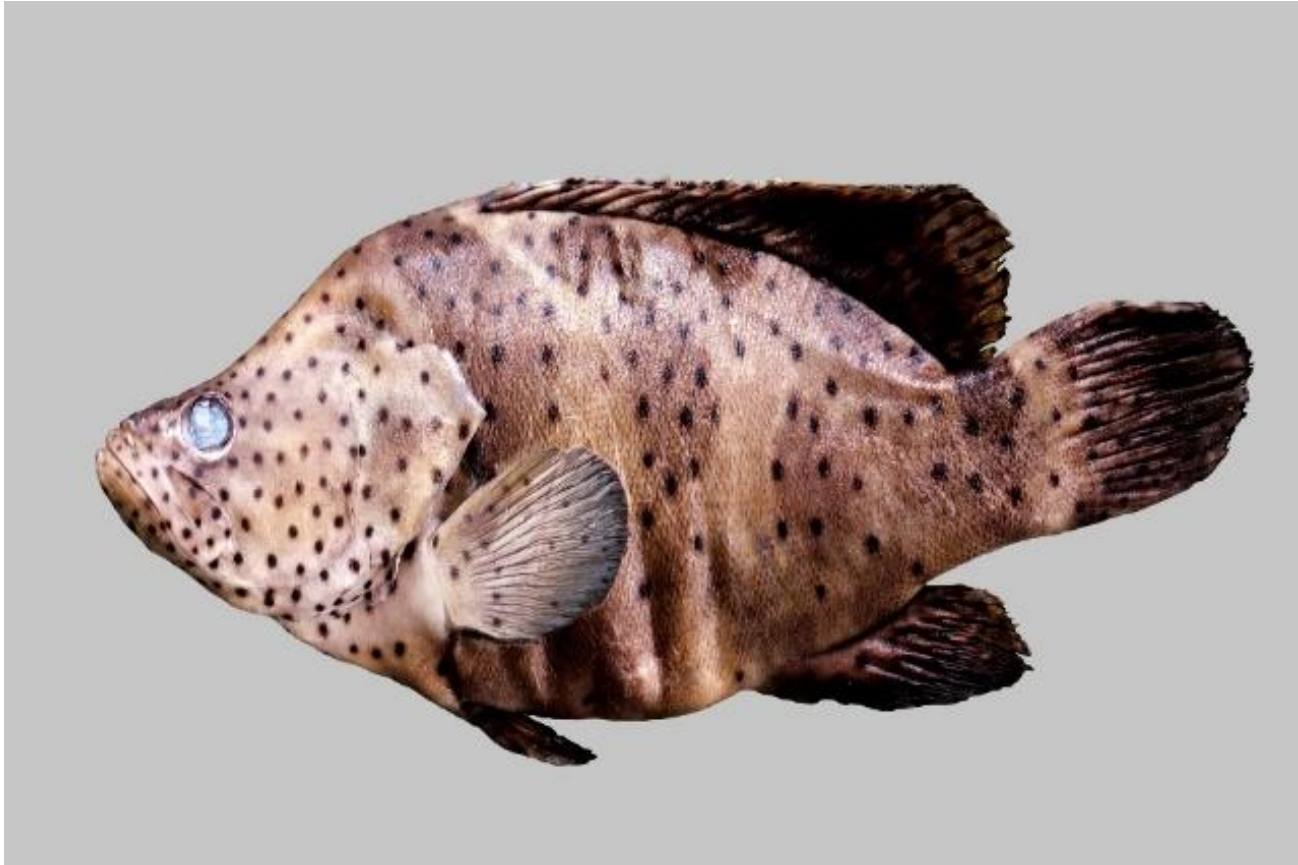


Figure 1 *Cromileptes altivelis* Valenciennes, 1828), EBRC/ZSI/F 12837, 490 mm SL, Digha fish landing centre

Colour

Body light whitish brown with randomly scattered round black spots on head, body and fins

Distribution

Eastern Indian Ocean, Western Pacific: Bangladesh, Myanmar, Andaman Sea and Indonesia east to Fiji, North to Southern Japan, Australia and Hawaiian (Froese and Pauly, 2022). From Indian coast this species is reported from Andaman and Nicobar Island (Day, 1875; Rao et al., 2000; Rajan et al., 2017), Tamil Nadu (Ramesh et al., 2008) and Kerala (Fischer & Bianchi, 1984; Bijukumar and Raghavan, 2015). Present study reports this species first time from northern part of east coast of India as well as West Bengal.

Cephalopholis sonnerati* (Valenciennes, 1828)**Tomato Grouper*****Material examined**

EBRC/ZSI/F 13618, 02 ex., 230.2–240 mm SL, Digha fish landing centre, Purba Medinipur, West Bengal, Ray and party, 06/ii/2022.

Diagnostic characters

D: IX+16; A: III+9; P: 18; V: I+5; C: 18 GR: 23; LL: 119. Body robust, deep and slightly compressed. Head large and its dorsal profile straight, interorbital space slightly convex, mouth oblique, lower jaw longer than upper jaw, nape convex. Teeth villiform, present in bands on jaws, a pair of canine teeth present in front of on both jaws, small teeth present on vomer and palatine. Preopercle

margin serrated opercle with flat spines; maxilla cross the posterior margin of eye. Pelvic fin extent up to the anus, caudal fin rounded (Figure 2).



Figure 2 *Cephalopholis sonnerati* (Valenciennes, 1828), EBRC/ZSI/F 13618, 230.2–240 mm SL, Digha fish landing centre.

Colour

Vibrant reddish brown with numerous whitish spots on body; whitish network like patterns present on head

Distribution

Indo-West Pacific: East Africa, South Africa, Socotra, Madagascar and Mascarenes east to Marshall Islands, Samoa and Tonga, north to Japan, south to Western Australia and New Caledonia (Froese and Pauly, 2022). From Indian coast this species was reported from Andaman and Nicobar Island (Dhandapani and Mishra, 1998; Rao et al., 2000; Rajan et al., 2017), Odisha (Behera et al., 2015), Andhra Pradesh (Kandula et al., 2015), Tamil Nadu (Mishra and Krishnan, 2003; Anrose et al., 2007; Ramesh et al., 2008; Sluka and Lazarus, 2010; Barman et al., 2011), Kerala (Bineesh et al., 2014; Basheer et al., 2017), Karnataka (Sluka and Lazarus, 2010) and Lakshadweep (Jones and Kumaran, 1959; Jones, 1969; Jones and Kumaran, 1980). Present study reports this species from West Bengal coast for the first time which indicates of its distribution throughout the east coast of India.

Epinephelus epistictus (Temminck & Schlegel, 1842)

Dotted grouper

Material examined

EBRC/ZSI/F 13091, 01 ex., 87.6 mm SL, Petuaghat fish landing centre, Purba Medinipur, West Bengal, Ray and party, 22/x/2019.

Diagnostic characters

D: XII+13; A: III+8; P: 18; V: I+5; C: 19 GR: 22; LL: 65. Medium sized fish with stout and moderately compressed body. Dorsal profile of head and interorbital space convex. Preopercle with 3 enlarge serrae; upper edge of opercle straight; maxilla reaches almost vertical at the end of the eye. Mouth oblique, lower jaw slightly larger than upper jaw; mid side of lower jaw with two rows of teeth. Pelvic fin not reach up to the anus, caudal fin rounded (Figure 3).

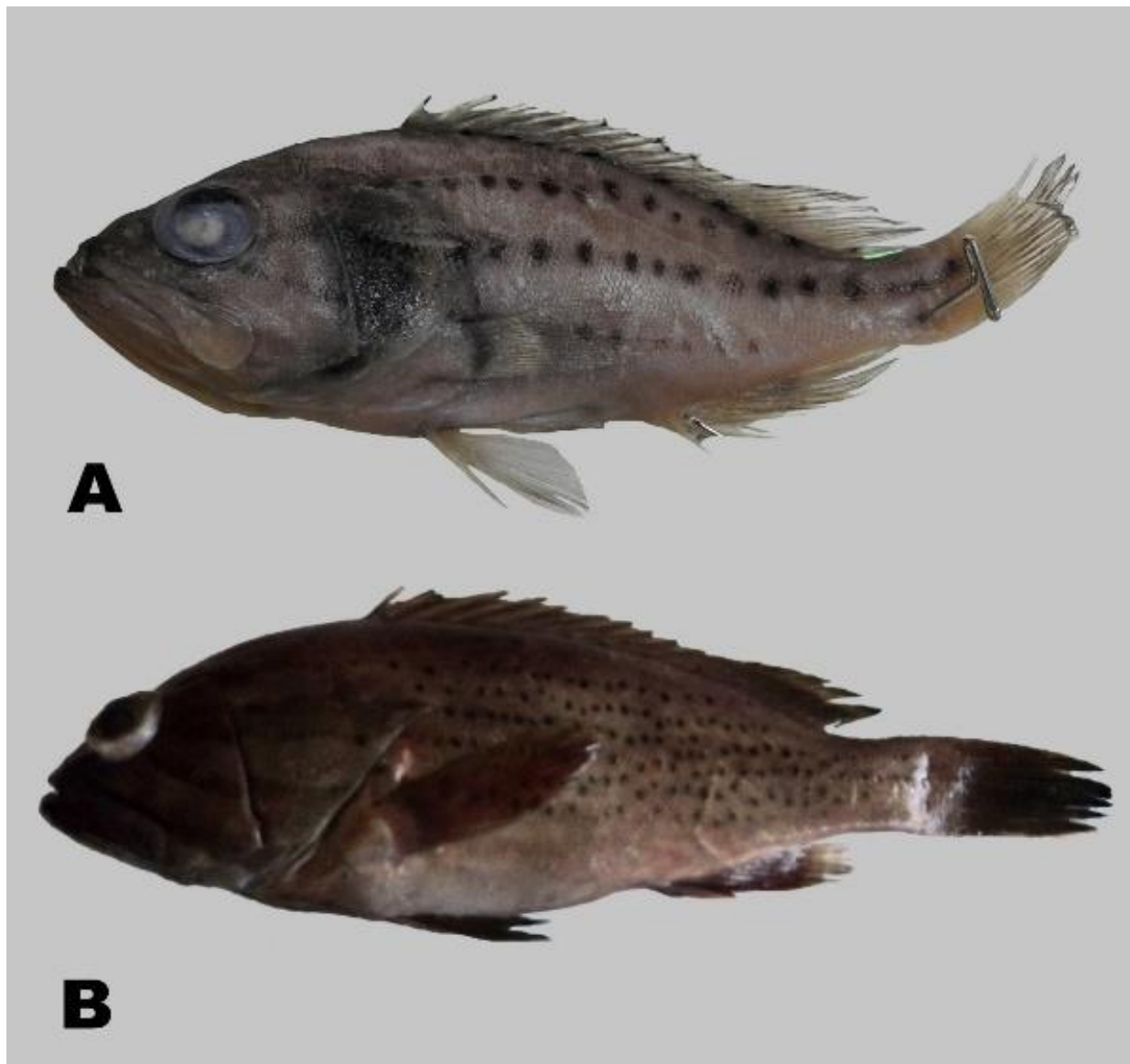


Figure 3 A. *Epinephelus epistictus* (Temminck & Schlegel, 1842), EBRC/ZSI/F 13091, 87.6 mm SL, Petuaghat fish landing centre; B. *Epinephelus magniscuttis* Postel, Fourmanoir and Guezé, 1963, MARC/ZSI/F 2478, 275 mm SL, Digha Mohona.

Colour

Body light brown (whitish after preservation) with three rows of dark spots on body starting from posterior orbital margin

Distribution

Red Sea; Indo-West Pacific: East Africa, South Africa, Comoros, Madagascar and Persian Gulf east to Philippines and New Guinea, north to Korea, southern Sea of Japan, Ogasawara Islands (Japan) and Australia (Froese and Pauly, 2022). From Indian coast this species is reported from Andaman and Nicobar Island (Rajan, 2015; Rajan et al., 2017), Andhra Pradesh (Kandula et al., 2015), Kerala (Fischer and Bianchi, 1984; Bineesh et al., 2014; Basheer et al., 2017). Present paper reports this species first time from West Bengal coast as well as Northern part of east coast India.

Comments

This species closely resembles *Epinephelus magniscuttis* Postel, Fourmanoir & Guézé, 1963. However, *E. epistictus* is clearly differentiated from *E. magniscuttis* in having fewer and smaller dark spots on head and body, further, juveniles of *E. epistictus* having dark spots arranged in three longitudinal rows on body (Heemstra and Randall, 1993).

Pogonoperca ocellata Günther, 1859

Indian Soapfish

Material examined

EBRC/ZSI/F 12836, 01 ex., 213 mm SL, Digha fish landing centre, Purba Medinipur, West Bengal, Ray and party, 28/iii/2018.

Diagnostic characters

D: VIII+12; P: 15; A: III+8; V: I+5; C: 17; GR: 2+6; LL: 52. Medium size fish with oblong and compressed body. Mouth moderately large, lower jaw longer than upper jaw. Maxilla reach vertically up to the posterior margin of eyes. Villiform teeth present in jaws, vomer and palatine. Upper part of preopercle margin with 3 spines, subopercle and interopercle smooth; at the tip of the chin a fleshy flap present which length is almost similar to eye diameter; caudal fin rounded (Figure 4).



Figure 4 *Pogonoperca ocellata* Günther, 1859, EBRC/ZSI/F 12836, 213 mm SL, Digha fish landing centre.

Colour

Body brownish with numerous dark-edged small white spots arranged in close set, forming reticulation present on head, body and fins; 5 black saddles on back, the first on nape, second on pre dorsal region, third on base of spinous part of dorsal fin, fourth on base of soft part of dorsal fin and the last anteriorly on caudal peduncle.

Distribution

Indian Ocean: Socotra, Seychelles, Réunion and Mauritius (Mascarenes) and Maldives east to Andaman Sea, western Indonesia, Sumatra and Java. From Indian coast this species is reported from Andaman and Nicobar Island (Rajan and Sreeraj, 2015), Tamil Nadu (Varghese et al., 2011) and Kerala (Akhilesh et al., 2021). Present study reports this species first time from northern part of east coast of India as well as West Bengal.

Remarks

Pogonoperca ocellata and *P. punctata* were previously synonymised but after that Anderson et al., (1998); Randall and Schraml, (2010) considered those as two different species. However, *P. ocellata* possesses whitish spots on the body which are much smaller and dense in comparison to *P. punctata*; further dense white markings also present in all fins of *P. ocellata* which are absent in case of *P. punctata* (Anderson et al., 1998).

4. DISCUSSION

The recent past ten additional species from West Bengal waters increase the total species of grouper to fifteen for the state (Ray and Mohapatra, 2020). Present study added further four more serranid fishes; among them *Cromileptes altivelis*, *Epinephelus epistictus* and *Pogonoperca ocellata* were earlier restricted to southern part of east coast of India and this report forms the first record of the species on the northern part of east coast of India. The reports of these groupers and soapfish indicates a possibility of a hidden coral patch ecosystem on the northern part of Bay of Bengal.

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Authors' Contributions

Collection and Identification: DR, SR. Data analysis: SR. Manuscript preparation: DR, SR. Manuscript editing and verification: AM.

Ethical approval

Three species of percoid fishes belonging to family Serranidae from northern part of east coast of India was observed in the study. The Animal ethical guidelines are followed in the study for species observation & identification.

Informed consent

Not applicable.

Conflicts of interests

The authors declare that there are no conflicts of interests.

Funding

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Data and materials availability

All data associated with this study are present in the paper.

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