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Short Communication

First record of two Cardinalfishes (Perciformes: Apogonidae) from West Bengal, along the North-East coast of India

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Two cardinal fishes of the family Apogonidae were collected from Digha coast, West Bengal, Northeastern part of Bay of Bengal. These fishes were captured as trawl net from about 30 km off the coast. The specimens were identified as *Jaydia queketti* (Gilchrist, 1903) and *Ostorhinchus fasciatus* (White, 1790). Both the species are herein reported for the first time from the northeast coast of India (West Bengal) and confirms the range extension.

[**Keywords**: Apogonidae, Bio-inventory, Digha coast, Geographical range, West Bengal]

Introduction

Apogonids, popularly known as cardinalfishes, are small percoid species, generally nocturnal in habit and usually of size < 100 mm in total length. They are mostly shallow water inhabitants of warm temperate to tropical/ subtropical marine environments, qualitatively abundant in the reef ecosystems and few are found entering estuaries and lowland freshwater bodies[1,2]. They occur in the Atlantic, Indian, and Pacific Oceans and are distributed in a wide range of ecosystems *viz*., coral reefs, rocky ridges, sea grasses meadows, coralline algal meadows and other soft-bottom communities[3].

From the year 1992[refs. 4,5] to 2017[refs. 6,7], all the checklists published contain only one species of cardinalfish, *i.e*. *Apogon lateralis* Valenciennes = *Fibramia lateralis* (Valenciennes 1832), reported from West Bengal coast following observations by Misra[8]. In 2018, Ray *et al*.[9] reported on more species of cardinalfish, *Jaydia striata* (Smith and Radcliffe, 1912) from West Bengal. The present report of *Jaydia queketti* and *Ostorhinchus fasciatus* from Digha coast adds these two Apogonid species to the fish faunal diversity of West Bengal coast and expands the distributional range of these species to northernmost extreme of the east coast of India.

Materials and Methods

On 12 September 2016, two Apogonid specimens were collected from the demersal fish trawl landings at Digha Mohona fish landing centre (21º37.843′ N and 87º32.827′ E), north-eastern coast of India and subsequently identified as *Jaydia queketti* (Gilchrist, 1903) and *Ostorhinchus fasciatus* (White, 1790). These fishes were captured by trawl net from about 30 km off the coast as confirmed from fishermen (Fig. 1). After collection, the fishes were photographed in fresh condition and then preserved in 5 % formaldehyde solution. The first one is deposited in the Zoological Survey of India (ZSI), Kolkata (ZSI F-12810/2) and, the second one kept in ICAR-Central Institute of Fisheries Education, Kolkata Centre Museum (CIFE) (CIFE/KOL/MW/F-0236). Identification was carried out as per relevant literature[3,10,11]. All the measurements were made by digital calipers with up to 0.1 mm accuracy. Morphometric characters of both the specimens are given in Table 1.

Results

Family: Apogonidae Gunther, 1859

Genus: *Jaydia* Smith, 1961

Jaydia queketti (Gilchrist, 1903) (Fig. 2)

Apogon queketti Gilchrist, *Marine Investigations in South Africa*, 2 (206) (1903), Pl. 14 (Type locality: Kwa Zulu-Natal coast off Teguela River mouth, South Africa); *Jaydia queketti*: Mabuchi *et al*., *Zootaxa*, 3846 (2) (2014) p. 202.

Materials examined: ZSI F-12810/2, 1 ex, 84.77 mm SL, Location: off Digha coast, India, Date of Coll. 12-09-2016.

Diagnostic features: A medium sized Apogonid, with enlarged dark ocellus on the posterior part of first dorsal fin and conspicuous parallel rows of dark brown spots over the body (Fig. 1). First dorsal-fin with VII spines (4th spine longer than 3rd spine, 4th and 5th spine subequal), second dorsal fin with I spine and 9 rays; anal fin rays II, 8; pectoral fin rays 15, caudal fin rounded, rays segmented. Large ctenoid scales on body; median pre-dorsal scales 2, transverse scales

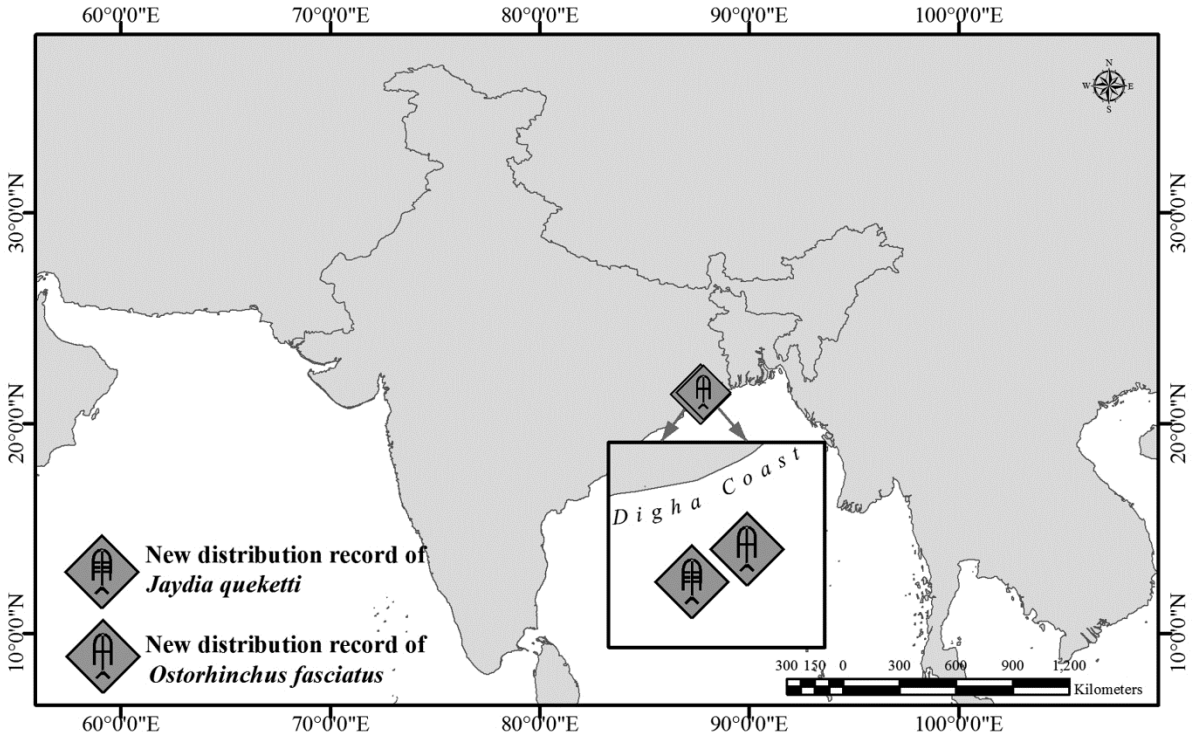

Fig. 1 — New distribution record of *Jaydia queketti* and *Ostorhinchus fasciatus* from Off Digha Coast, Northern Bay of Bengal

Table 1 — Morphometric measurements in % of SL of two cardinal fishes from the north-east coast of India (present study)

Morphometric characters	*Jaydia queketti*	*Ostorhinchus fasciatus*
Standard length	84.77 mm	69.50 mm
Body depth	35.46	34.58
Body width	18.44	18.02
Head length	45.68	40.20
Snout length	8.03	8.65
Orbit diameter	11.86	12.63
Interorbital length	10.49	7.12
Upper-jaw length	22.42	19.64
1st dorsal spine length	3.85	1.42
2nd dorsal spine length	9.19	7.13
3rd dorsal spine length	14.04	16.38
4th dorsal spine length	15.31	15.93
1st anal spine length	2.81	2.47
2nd anal spine length	11.03	11.91
Pectoral-fin length	21.94	25.58
Pelvic-fin length	23.78	23.35
Pelvic spine length	12.85	13.06
Caudal-peduncle depth	16.44	15.19
Caudal-peduncle length	20.45	23.70

from dorsal fin origin to lateral line 2; single lateral line extends on to caudal fin, LL 24 (+ 3 on caudal). Gillrakers 16 (5 + 11); developed gill rakers 13 (3 + 10), branchiostegal rays 5. Preopercle ridge

Fig. 2 — *Jaydia queketti* (ZSI/F12810/2, 102.33 mm TL, off Digha)

smooth, edges finely serrated, preopercle bones scaled, post-temporal bone serrated. Mouth moderately large; maxilla partly covered by suborbital bone; small villiform conical teeth on jaws; supramaxilla very small. Pectoral fin pointed dorsally, ending just before anal fin origin. Origin of anal fin under third soft dorsal ray.

Colour: Body normally pinkish to light grey dorsally, fades towards abdomen and shading to silvery on sides and abdomen, covered with dark

brown spot forming longitudinal rows. An enlarged dark ocellus present on the posterior part of first dorsal fin. Inner lining of stomach and intestine dark; anal fin yellowish, dusky and its distal edge intense black; edges of second dorsal and caudal fin blackish.

Distribution: Western Indian Ocean: southern Red Sea, south and east coast of Africa, Arabian Sea and the Mediterranean Sea[12]. From Indian waters it has been reported from the Gulf of Mannar[13,14], Visakhapatnam[15], along east coast and from Gujarat[11] and Kerala[16] in the west coast of India.

Genus: *Ostorhinchus* Lacepede, 1802

Ostorhinchus fasciatus (White, 1790) (Fig. 3)

Mullus fasciatus White, *Journal of a voyage to New South Wales* (1790) p. 268, Pl 53 (Type locality: Port Jackson, New South Wales, Australia); *Ostorhinchus fasciatus*: Mabuchi *et al*., *Zootaxa*, 3846 (2) (2014) p. 200.

Materials examined: CIFE/KOL/MW/F-0236, 1 ex., 69.50 mm SL, Location: off Digha coast, India, Date of Coll. 12-09-2016.

Diagnostic features: Dorsal-fin rays VII + I, 9 (3rd spine longer than 4th spine); anal fin rays II, 8; pectoral fin rays 14; pelvic fin I, 5; principal caudal rays 9 + 8, caudal fin forked; lateral line on to caudal, LL 24 (+ 2 on caudal). Very large ctenoid scales on opercle, subopercle, cheek, breast, nape, body and pelvic areas; median predorsal scales 5, two scales between dorsal origin and LL, transverse scale rows below lateral line 7, preopercle bones scaled. Gill rakers 22 (developed 17); branchiostegal rays 5; post-temporal with 4 serrations on posterior margin; preopercle ridge smooth, edges serrate on posterior and ventral margins; infraorbital edge smooth and weak serrations on third infraorbital. Villiform teeth in several rows on the premaxilla; several villiform rows on dentary; 2 rows on the palatine and 2 rows on vomer.

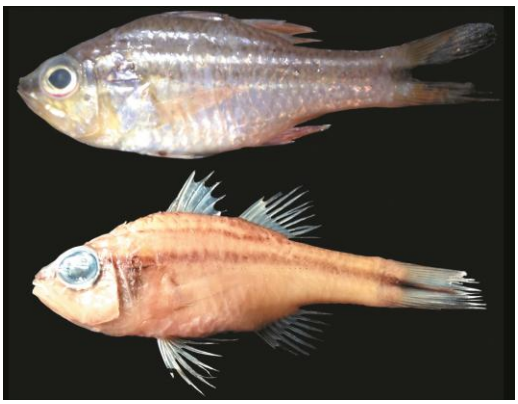

Fig. 3 — *Ostorhinchus fasciatus* (CIFE/KOL/MW/F-0236, 90.72 mm TL, off Digha)

Colour: Body white to dusky pinkish with 3 prominent dark stripes on the upper half of body; dark dorsal stripe from snout over eye ending about middle of second dorsal fin but not passes the second dorsal-fin base, mid-lateral stripe broad, uniform from snout through eye extending to edge of caudal fin, and base of second dorsal fin with thin stripe darker posteriorly up to upper caudal peduncle; an incomplete diffused stripe above mid-lateral stripe. Inner lining of stomach and intestine dark.

Distribution: Red Sea, Indo-West Pacific: East Africa, Seychelles, Madagascar, and Reunion (Mascarenes) south to Mozambique, east to the Philippines and New Guinea, north to southern Japan, south to northern Australia; Mediterranean Sea (Red Sea immigrant)[11]. From Indian waters, it has been recorded from maritime coasts of Odisha[17], Andhra Pradesh[18], Tamil Nadu[19] along the east coast; Kerala[16], and Maharashtra[20] along the west coast and union territory of Lakshadweep[21] and Andaman & Nicobar Islands[22].

Discussion

The genus *Jaydia* Smith 1961 is placed under the subfamily Apogoninae and has 20 valid species worldwide[23], of which only six species are found in Indian waters[11], *viz*., *Jaydia noveguinae* Valenciennes 1832, *J. poecilopterus* (Cuvier, 1828), *J. queketti* (Gilchrist, 1903), *J. smithi* Kotthaus, 1970, *J. striata* (Smith & Radcliffe, 1912) and *J. truncate* (Bleeker,1855). Gon[11] in his revision work on the subgenus *Jadiya*, has reported *J. queketti* from off Gujarat coast. Recently, this species has been recorded from the Gulf of Mannar[13], Kerala coast[16] and Viskhapatnam, Andhra Pradesh[15]. The present report forms its first record from the West Bengal coast. *J. queketti* can easily be distinguished from all its congeners in having a combination of characters: absence of ossified serrae on preopercular edge, only 2 or 3 predorsal scales, two developed gill rakers on upper arm of first gill arch, large black spot on first dorsal fin and body covered with dark brown spots.

On the other hand, the genus *Ostorhinchus* Lacepede 1802 contains about 93 species of the cardinal fishes[3]. Fraser[10] recognized six species having blackish to brownish mid-lateral stripe from snout to end of caudal-fin rays and without a caudal peduncular or basicaudal spot under the '*Apogon' fasciatus* group, *viz*., *O. bryx* (Fraser 1998),

O. fasciatus (Shaw 1790), *O. kiensis* (Jordan & Snyder 1901), *O. pleuron* (Fraser 2005), *O. quinquestriatus* (Regan 1908) and *O. septemstriatus* (Günther 1880). Of these six species, *O. bryx*, *O. fasciatus* and *O. pleuron* are known from the Indian waters[10]. The former is having VI spines on first dorsal fin, while the latter two species have VII spines. Higher developed gill raker count (17 – 20 vs 14 – 17), narrow vertical bars from mid-lateral dark stripe and presence of melenophores on roof of mouth distinguishes *O. pleuron* from *O. fasciatus. O. fasciatus* is a very common species from Odisha coast to Maharashtra coast of peninsular India. However, it was never reported from the West Bengal coast earlier and this forms its first record from the West Bengal.

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Conflict of Interest

On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethical Statement

The specimens used for the study were collected in dead condition from trash materials. These fishes are not protected under Wildlife Protection Act (1972) of India and also not included under IUCN threatened list.

Author Contributions

AP: Specimen collection, conceptualization, formal analysis, original draft and writing; BKM: Conceptualization, review & editing; and SSM: Investigation, supervision, review & editing.

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