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First record of dusky tailed cardinal fish, *Taeniamia macroptera* (Cuvier, 1828) from Chilika lagoon, India

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Surveys conducted to study the fish diversity of Chilika lagoon, east coast of India, during 27-30 May 2015 recorded the species *Taeniamia macroptera* (Dusky-tailed cardinalfish) belonging to the family Apogonidae. This is a new record from the lagoon. The species, occurring in marine waters along the costs of India, was recorded from the saline zone, 11 km inside the lagoon at a salinity of 34.6 ppt.

[Keywords: *Taeniamia macroptera*, Cardinal fish, Apogonids, Chilika]

Introduction

Chilika lagoon, situated in the northeast coast of India, in Odisha, supports highly diverse biota including fishes. The earliest work on the fish diversity of the lagoon is that of the Zoological Survey of India, recording 112 fishes[1,2,3,4]. Kaumans[5] added a gobbid species to the list. Jones and Sujansinghani[6] updated the list with addition of another 25 species. The list was added with 14 more fish species by Roy and Sahoo[7] and 10 more species by Menon[8]. Another 62 more fish species were added to the list during the 1960s to 2000s[9,10,11,12,13,14,15,16]. Thus the total fish species record from the lagoon stood at 225. The silted sea-mouth of the lagoon was reopened during the year 2000, leading to enhancement of fish diversity[17,18]. With this another 57 new records were added[19,20] and the list of fish species was revised to 315, belonging to 205 genera of 87 families[21]. Considering the highly dynamic nature of the ecosystem of Chilika, the lagoon might be supporting even more number of fish species, and hence the lagoon has been under constant fisheries explorations. In one such exploration during May 2015, occurrence of the Dusky-tailed cardinal fish, *Taeniamia macroptera*, belonging to the family Apogonidae, was recorded.

Materials and Methods

The fish sample was collected from Chilika lagoon, situated in Odisha, spread over Puri, Khurda and Ganjam districts, along the east coast of India, between 19^o 28' and 19^o 54' North Latitude and 85^o 06' and 85^o 35' East Longitude. The lagoon has a water spread of 1165 square km[22]. It is shallow, with water depth varying between 0.38 and 4.2 m[23]. The lagoon has unique characteristics of an estuarine ecosystem, due to freshwater inflow from the distributaries of Mahanadi river system and seawater influx from Bay of Bengal through two sea-mouths (Fig. 1). The lagoon is a designated Ramsar site since 2002[24]. Based on salinity gradient and depth, the lake has been classified into four broad ecological zones; the southern zone (saline), central zone (brackish), northern zone (freshwater) and the outer channel (saline)[24] as shown in Fig. 1. The species was recorded while collecting samples for fish diversity and distribution studies through experimental fishing and observation of fisher's catch while they were being fished. Species was caught in *Khonda* net (set barrier nets) operated in the early morning hours of the day at Satapada (Fig. 1), about 11 km inside the lagoon from the sea mouth.

The species was well preserved in 10% formalin and brought to the laboratory for further study. Fish was identified using standard keys and literature[25,26] through morphometric and meristic characters.

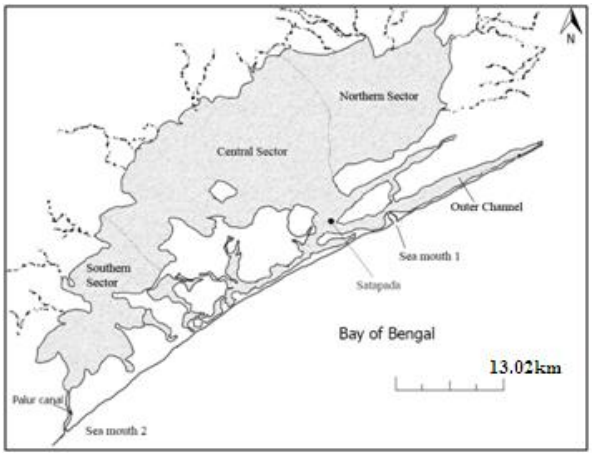

Fig. 1. Chilika lagoon indicating different ecological sectors and the site of specimen record.

Results and Discussion

The species was recorded from the outer channel, near Satapada, which is 11 km inside the lagoon from the sea mouth (Fig. 1) at a salinity of 34.6 ppt. The natural habitat of the fish includes clear water areas like coral beds and rocky reefs with sand or rubble bottom[26] and reported as a marine inhabitant[27]. This indicated that the environment from which the species recorded in Chilika was favorable to the species and might have entered into the lagoon through the sea mouth. The taxonomic position of the species is as following.

Order –Perciformes
Family – Apogonidae
Type- *Taeniamia macroptera* (Cuvier, 1828) (Fig. 2)

Common name: Dusky-tailed cardinal fish

Synonyms: *Apogon macropterus* (Cuvier, 1828)
Archamia macroptera (Cuvier, 1828)
Apogon zeylonicus (Cuvier, 1829)
Apogon argentus (Valenciennes, 1832)

The fish has a short, deep and compressed body, semi-transparent in nature with orange tinged bands across the body. A black spot is there on the rear end of the caudal peduncle. The total length is 6.6 cm and standard length of the fish is 5 cm. Scales are large and ctenoid. First and second dorsal fins are completely separated. First dorsal fin has 6 spines. Second dorsal fin has 1 spine and 9 soft rays. Anal fin has 2 spines with 15 soft rays. Pelvic fin has 1 spine and 5 soft rays. Scales on the lateral line series are 25. The median pre-dorsal scales count 5. Large eyes with diameter of 6.5 mm. Distance from insertion of pelvic spine to anal-fin origin are 4.64 in SL. Gill rakers are five in number. The suborbital portion of the infraorbital canal is highly perforated. The medians of the secondary canal projections are also perforated along with the margins. The lateral margins of the mandibular canal are highly branched and perforated. Double edged preopercle, whose posterior edge is completely serrated and ventral edge serrated on posterior half. The morphometric measurements are given in Table 1.

Colour in life: Semi-transparent body with orangish bars running longitudinally across the entire body from nape. Dark black spot on the caudal peduncle prominent. Cheek and top of the head with numerous small dusky spots.

Colour in formalin preserved: Uniform white with trace pinkish bars on the body. Transparency lost completely. All fins retain a slight pinkish tinge, with spot on the caudal peduncle very prominent. The spots on the cheek and head become prominent.

Species of the family Apogonidae are small sized (around 10 cm), brightly colored and ray-finned, occurring in Atlantic, Pacific and Indian ocean. They are mostly marine but few range up to freshwater and include 346 species[28]. Apogonids are nocturnal planktivores, known to occur in large numbers in Indo-west pacific reefs and lagoons, usually found in aggregations among branching corals[29,30]. They are well distinguished with their large mouth and eye along with two separated dorsal fins. Apogonidae is distinguished from the most closely looking family Ambassidae by presence of two separated dorsal fins and 1 or 2 anal fin spines; the Ambassidae has one dorsal fin and 3 anal spines.

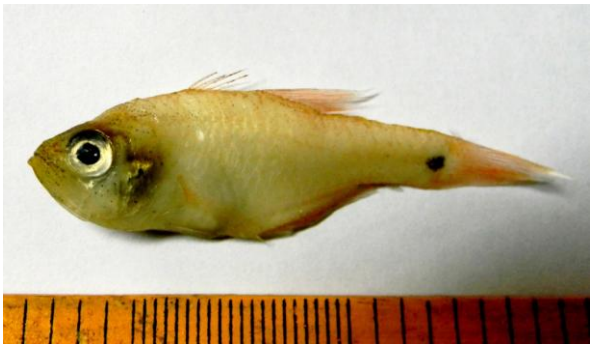

Fig. 2. *T. macroptera* recorded from Chilika lagoon.

Taeniamia is differentiated from other genus of the family by presence of 9 soft dorsal fin rays. The species *T. macroptera* is closer to the *T. fucata.* Both have a large, dark black spot on the caudal peduncle but the later differs in possessing a white tip in the anal fin and two blue stripes on the snout to eye[31]. The posterior opercular edge is completely serrated in *T. macroptera* whereas *T. fucata* has few to no serrations[32]. Apogonids have been recorded from a number of marine ecosystems of India[33,34,35]. The fish is distributed along the Indo-West Pacific: eastern Indian Ocean and western Pacific. *T. macroptera* has been recorded from India by[25] as *Apogon macropterus,* distributed in seas of India to the Malay Archipelago and reported it to be very common along Madras (Chennai) waters. Rajan[35] recorded *Archamia fucata*, *A. macroptera* in the similar genus from Andaman waters. Recording of the species from a location 11 km in to the lagoon from the sea mouth indicates its extended distribution in the saline zone of the lagoon. With addition of *T. macroptera*, in the present study, the family Apogonidae has been added to the list of fish families recorded from Chilika lagoon. The genus as well as the species are also first records from the lagoon. The fish not being recorded earlier from Chilika, in spite of several explorations, could be due to their small size and very close resemblance to Ambassidae, species of which are abundant in the lagoon.

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Table. 1. Morphometric measurements of *T. macroptera* collected from Chilika lagoon.

Sl. No.	Morphometric Characters	Measurements (mm)	%SL	in SL	in TL	in HL
1	Total L (TL)	66	129.41	0.77		0.25
2	Standard L(SL)	51	100.00	1.00	1.29	0.32
3	Fork L	5	9.80	10.20	13.20	3.30
4	Head L (HL)	16.5	32.35	3.09	4.00	1.00
5	Pre-orbital L	4	7.84	12.75	16.50	4.13
6	Eye diameter	6.5	12.75	7.85	10.15	2.54
7	Post orbital L	8	15.69	6.38	8.25	2.06
8	Body depth	17	33.33	3.00	3.88	0.97
9	Lower jaw L	9.5	18.63	5.37	6.95	1.74
10	Upper jaw L	9	17.65	5.67	7.33	1.83
11	Pectoral fin L	15	29.41	3.40	4.40	1.10
12	Pelvic fin L	10	19.61	5.10	6.60	1.65
13	Pre dorsal I	19	37.25	2.68	3.47	0.87
14	Pre dorsal II	27	52.94	1.89	2.44	0.61
15	Dorsal I	8.5	16.67	6.00	7.76	1.94
16	Dorsal II	14	27.45	3.64	4.71	1.18
17	Inter dorsal L	4.5	8.82	11.33	14.67	3.67
18	Pectoral fin base L	3	5.88	17.00	22.00	5.50
19	Pelvic fin base L	3	5.88	17.00	22.00	5.50
20	Dorsal I	4	7.84	12.75	16.50	4.13
21	Dorsal II	8	15.69	6.38	8.25	2.06
22	Anal Fin L	19	37.25	2.68	3.47	0.87
23	Anal base L	15	29.41	3.40	4.40	1.10
24	Caudal peduncle L	16.5	32.35	3.09	4.00	1.00
25	Caudal peduncle depth	7.5	14.71	6.80	8.80	2.20
26	Pre-pelvic L	17	33.33	3.00	3.88	0.97
27	Pre- pectoral L	17.5	34.31	2.91	3.77	0.94
28	Pre- anal L	24	47.06	2.13	2.75	0.69

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