

First record of two species of goby fish, *Cryptocentrus cyanotaenia* Bleeker and *Istigobius diadema* Steindachner (Perciformes: Gobiidae) in Indian waters

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Two goby fishes *Cryptocentrus cyanotaenia* Bleeker, 1853 and *Istigobius diadema* Steindachner 1877 were collected from the Tuticorin and Mandapam coastal waters of Tamilnadu, India. *C. cyanotaenia* is well distinguished by the presence of grey color body with 9 narrow white bars; blue lines and spots with markings on the head and snout; yellow margins of dorsal, anal and caudal fins. *I. diadema* is easily recognized by bold black line on the posterior portion of the eye; head region with a dark reddish tinge; dorsal, anal and caudal fins with dark spots.

[**Keywords:** *Cryptocentrus cyanotaenia*, *Istigobius diadema*, Gobiidae, First record, Tamilnadu, India]

Introduction

Gobies are the largest family of marine fishes which have more than 1875 species in 212 genera, currently classified as the most species rich family of vertebrates. They live on bottom habitats varying from coral reefs to the sand flats. They are distinct with two-part dorsal fins, pelvic fins that joined beneath the body forming cup shaped discs. The gobies have circum-tropical distribution throughout the Indo-Pacific¹. Among the tropical marine perciform fishes, there is a group of elongate, presumably burrowing forms of small to medium size, which superficially resembles one another. However, a large number of species known as shrimp gobies survives by sharing burrows with snapping shrimp of the genus *Alpheus* sp. The nearly-blind shrimps need the sharp eyed gobies to warn of danger, while the gobies need a ready made place to hide².

The taxonomy of this genus *Cryptocentrus* is complicated partly because of the existence of lacustrine populations, clinical variations within the broad range of the species, and probably differential growth patterns in the young as well as sexual dimorphism. In addition, the color patterns of some species are also variable³. Till now several species have been known only from a single specimen or from a single collection and many of them seems to be endemic.

In Indian peninsula, gobiidae fishes have been hitherto recorded from Andaman and Nicobar islands - 115 species⁴, Gulf of Mannar - 70 species⁵, Bombay coast (Maharashtra) - 21 species⁶, Vellar estuary - 23 species⁷ and Lakshadweep - 15⁸ respectively. But the lists of gobiidae fishes from the Gulf of Kutch waters are still unknown. In India, the fishes of these two genus *Cryptocentrus* and *Istigobius* are rarely seen. So far, in Andaman &

Nicobar islands 4 species under the genus *Cryptocentrus* (*C. fasciatus*, *C. octofasciatus*, *C. pavaninoides* and *C. strigiliceps*) and 3 species under the genus *Istigobius* (*I. decoratus*, *I. ornatus* and *I. goldmanni*) were recorded⁴. In Gulf of Mannar, only one species of *C. gymnocephalus* and two species of *I. goldmanni* and *I. ornatus* were recorded⁵.

Materials and Methods

The Gulf of Mannar (GOM) coast extends from Rameswaram to Tuticorin lies between the latitudes 78°5'E - 79°30'E and longitudes 8°45'N - 9°25'N, extends to a distance of 140 km. There are 21 islands running almost parallel to the coastline of Gulf of Mannar⁵ (Fig. 1).

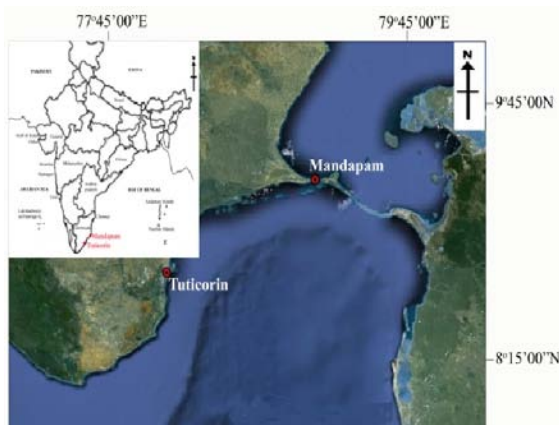


Fig. 1—Map showing the sampling sites: Tuticorin and Mandapam

A recent survey was carried out in the Mandapam and Tuticorin coasts by adopting snorkeling and skin diving methods. The depth of the sampling site varies from 0.5-3m. Specimens were caught using small bait traps on the sandy bottoms and collected without causing any damage to the body parts. Only a single individual was caught on both the species and subsequently identified as *Cryptocentrus cyanotaenia* Bleeker and *Istigobius diadema* Steindachner by analyzing the morphometry and meristic characters. Single individual of *C. cyanotaenia* was found sharing the burrows with single alpheid shrimp *Alpheus* sp.

Length of the specimen was given as standard length (SL): the anterior end of the upper lip to the base of the caudal fin; head

length (HL): same anterior point to the posterior edge of the opercle flap; body depth taken vertically between the belly and base of the dorsal fin; snout length: the anterior end of the upper lip to the anterior edge of the eye; caudal peduncle depth is the least depth, and caudal peduncle length: horizontal distance between verticals at the rear base of the anal fin and the caudal fin base; lengths of fin rays are measured to their extreme bases. Meristic characters such as spines, rays, scales and gill raker counts are also considered to confirm the identity of the species. Meristic abbreviations are as follows: D – Dorsal fin; V – Ventral fin; A – Anal fin; P – Pectoral fin; Ll – Lateral line scales; PDS – Pre-dorsal scales. Finally, the morphometry are expressed as % standard lengths (SL) and % head lengths (HL).

Results

Order – Perciformes

Family – Gobiidae

Genus – *Cryptocentrus*

Cryptocentrus cyanotaenia Bleeker, 1853 (Fig. 2)

Material examined

A single specimen (SL 90 mm), India, Tamilnadu, Mandapam, 9°15'55.96"N 79°06'01.63"E, depth 2-3m, 26th January 2013, coll. T. T. Ajith Kumar, MBRC/ZSI M1-63

General description

D. VI, 13; V. 8; A. I, 13; P. 18; Ll. 36; PDS 29 (Table 1).

Body elongate and compressed; snout truncate to convex, shorter than the eye. Mouth oblique and lower jaw slightly prominent; lips thick. Two open pores in inter-orbital, one behind eye, presence of small distinct pores on supra-ocular grooves; scales cycloid and embedded. Head scaled above behind eye, nape scaled. First dorsal fin obtuse, lower than body, second, third and fourth rays are the longest. Second dorsal and anal fin higher than the first dorsal fin, pointed posterior. First dorsal fin connected to a base of the first soft ray of the second dorsal; maxillary extended almost half a

diameter behind eye; teeth on both the rows slightly enlarged and no canines. Pectoral fin slightly shorter than the head. Ventral fin obtuse, not longer than the pectoral fin; caudal fin oblong, little longer than the head.

Color

Largely greenish yellow on head and mandible, body gray with 9 narrow white bars; blue lines and spots with markings on the head and snout, yellow margin on 1st dorsal fin, blue streaks on 2nd dorsal, anal and tail fins, yellow margins on anal fins visible. Pelvic slightly violet and finely dotted with blue, pectorals hyaline, edges of caudal fin yellowish.



Fig. 2—*Cryptocentrus cyanotaenia* Bleeker (living individual). Lateral view (MBRC/ZSI M1-63). Photo by S. Prakash

Distribution

These species are available throughout the Indo-Pacific: Java⁹, Gulf of Thailand, Papua New Guinea and Micronesia¹⁰, East Indies^{3,11}, Singapore¹², Indonesia¹³. Now in India.

Habitat

The specimen was collected from the fine sandy bottoms at a depth of 2-3m and shares a burrow with single *Alpheus* shrimp species.

Remarks

This species is recorded for the first time in Indian waters. *Cryptocentrus cyanotaenia* may closely resemble *C. diproctotaenia* Bleeker especially the combination of oblique broken stripes on sides of head and several longitudinal bands on anal. However, it is easily distinguished by the presence of 6 vertical bands and 12 vertical blue lines on the sides. *C. wehrleri* Fowler is also

recognized as junior synonym of *C. cyanotaenia* (see Wongratana³ for further explanation)

Genus – *Istigobius*

Istigobius diadema Steindachner, 1877 (Fig. 3)

Material examined

A single specimen (SL 61.0 mm), India, Tamilnadu, Tuticorin, 8°50'06.94"N 78°12'48.77"E, depth 1.5-2m, 14th February 2013, coll. R. Vishwas rao. MBRC/ZSI M1-62

Description

D. VI, 11; V. 10; A. I, 10; P. 19; Ll. 31; PDS 18 (Table 1).

Body moderately elongated and compressed, head depressed, snout slightly rounded and projecting beyond the upper jaw. Gill opening not extending entirely through a pre-opercular margin. Pelvic fins united, frenum present. Scales ctenoid, chest and pectoral fin base with cycloid scales, head naked. Presence of pores and sensory canals on head; longitudinal pattern of sensory papillae on cheek.

Color

The bold black line from the posterior portion of the eye to above origin of pectoral fin, head region with a dark reddish tinge or blotch like. Anal, pelvic and lower part of caudal fins mottled with dark spots.

Distribution

Eastern Indian Ocean, Indonesia, Southwestern Thailand and Andaman sea¹¹,

Hong Kong^{14,15}, Singapore¹². Now in India.

Habitat

Found on the sandy bottom at the depth of 2m.

Table 1: Morphometry (expressed in % SL & % HL) and meristic characters.

Characters	<i>Cryptocentrus cyanotaenia</i> Bleeker	<i>Istigobius diadema</i> Steindachner
<i>Morphometry</i>		
Total Length (mm)	112.0	76.00
Standard Length (mm)	90.0	61.00
% SL		
Head length	26.67	26.23
Snout length	6.67	8.20
Eye diameter	4.44	6.56
Inter-orbital distance	2.22	4.92
Body length	71.11	75.41
Body depth	15.56	18.03
Caudal fin length	26.67	24.59
Caudal peduncle length	13.33	11.47
Caudal peduncle depth	10.00	16.39
Pre-opercular length	21.11	19.67
Post opercular length	7.78	8.19
Pre-dorsal length	34.44	36.06
Pre-anal length	61.11	54.10
Pre-ventral length	26.67	29.51
Dorsal fin base length-I	18.89	14.75
Dorsal fin base length-II	28.89	26.23
Length of longest dorsal spine	14.44	18.03
Length of longest dorsal ray	13.33	16.39
Ventral fin length	21.11	19.67
Ventral fin base length	4.44	4.92
Length of anal rays	16.67	16.39
Anal ray base length	23.33	21.31
Length of pectoral fin	17.78	26.23
Length of pectoral fin base	7.78	9.84
% HL		
Snout length	25.00	31.25
Eye diameter	16.67	25.00
Inter-orbital distance	8.33	18.75

<i>Meristic</i>		
Dorsal spines	VI	VI
Dorsal soft rays	13	11
Ventral fin rays	8	10
Anal spines	I	I
Anal rays	13	10
Pectoral fin rays	18	19
Pre-dorsal scales	29	18
Lateral line scales	36	31

Fig. 3—*Istigobius diadema* Steindachner (living individual). Lateral view (MBRC/ZSI M1-62). Photo by S. Prakash

Remarks

Istigobius diadema is recorded for the first time in Indian waters. *I. decoratus* is similar to *I. diadema*, which grows larger and has short, solid black bars on its sides¹⁵.

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