Rec. zool. Surv. India: Vol. 123(4)/317-321, 2023
DOI: 10.26515/rzsi/v123/i4/2023/172579

ISSN (Online) : 2581-8686
ISSN (Print) : 0375-1511

First record of *Acentrogobius nebulosus* (Forsskal, 1775) from the coast of Gujarat, India

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Abstract

The present study reports the occurrence of a gobiid species, *Acentrogobius nebulosus* (Forsskal, 1775) for the first time from the Gulf of Kutch, Gujarat. Specimens were collected from the Okha and Salaya fish landing centres under the district of Devbhumi Dwaraka in Gujarat.

Keywords: Gulf of Kutch, Okha, Salaya, Gobiidae

Introduction

Gujarat is the largest mainland coastal state in India, which covers about 23% of the total coastline, and is endowed with different marine habitats and resources (Sanjeevi *et al.*, 2014) including rare and threatened ones (Sidat *et al.*, 2021). A total of 486 species of marine and estuarine fishes belonging to 257 genera, 112 families and 26 orders were reported from Gujarat (Barman *et al.*, 2000) and another work carried out by Sidat *et al.* (2021) reported around 96 species from the northern side of the Gulf of Kutch area in Gujarat. Another recent study on the fish diversity along the coast of Sikka, Gulf of Kutch reported a total of 102 fish species under 72 genera, 53 families, 22 orders and 2 classes (Parmar *et al.*, 2022).

The family Gobiidae consists of about 1979 valid species under 259 genera all over the world (Fricke *et al.*, 2023). Sixty genera of gobiids have been found in India, out of which only six species of genus *Acentrogobius* have been reported. (Nair & Kumar, 2018; Rajan *et al.*, 2021). Studies on the family Gobiidae from Gujarat are comparatively scanty, and six species of gobiid fishes were recorded until the year 2000 (Barman *et al.*, 2000). After that, a study on the burrowing activities of gobiid fish, *Periophthalmodon septemradiatus* (Hamilton, 1822) was carried out by Bhatt *et al.* (2009) in the Navinal Coast, Gulf of Kutch. Two species of gobiids, Apocryptes bato (Hamilton, 1822) and *Scartelaos histophorus* (Valenciennes, 1837) were later found in the Gulf of Khambat, Gujarat (Shukla *et al.*, 2014). Another gobiid species, *Scartelaos cantoris* (Day, 1871) was mentioned in a study on the fish diversity in Sikka Bander, Rasulnagar (Bed), Bedibandar and Vadinar (Brahmane *et al.*, 2014). One additional species of mudskipper, *Boleopthalamus dussumieri* (Valenciennes, 1837) was discovered at the Khijadiya Wildlife Sanctuary in Gujarat (Jethva *et al.*, 2017). Gadvi *et al.* (2022) recorded the presence of the Rubicundus Eel Goby, *Odontamblyopus rubicundus* (Hamilton, 1822) for the first time from the Gulf of Khambat, Gujarat. In a study regarding the ichthyofaunal diversity along the Sikka Coast, Gulf of Kutch, Gujarat, two species of gobiids namely, *Acentrogobius dayi* Koumans, 1941 and *Amblygobius albimaculatus* (Rüppell, 1830) were mentioned (Parmar *et al.*, 2022). Thus, altogether 13 species of gobiids have been recorded from the state of Gujarat so far. The present study reports the occurrence of *Acentrogobius nebulosus* (Forsskal, 1775) for the first time from the coastal waters of this state.

Materials and Methods

The current study forms a part of an in-house research programme 'Icchthyofaunal diversity of Gulf of Kutch' of

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the Zoological Survey of India, Kolkata. Materials were collected from a recent survey conducted (17th to 26th December 2022) along the different regions of the Gulf of Kutch (Figure 1). Two specimens of *Acentrogobius nebulosus* were collected; each from Okha (lat: 22° 27' 0.126", long 69° 3' 53.2692") and Salaya (lat: 22° 18' 40.4712", long: 69° 36' 6.0768") landing centres (Figure 1). After collection and thorough cleaning, the specimens were immediately preserved in a 10% formalin solution. Thereafter, the preserved specimens were identified following standard reference (Smith & Heemstra, 1986) and deposited as National Zoological Collections in Marine Fish Section, Zoological Survey of India, Kolkata.

Materials examined: F15882/2 and F15883/2, 2 ex.,62.2 - 74.7 mm SL., Okha (Lat: 22° 27' 0.126", Long: 69° 3' 53.2692"), Salaya (Lat: 22° 18' 40.4712", Long: 69° 36' 6.0768 "), Gulf of Kutch, Gujarat, H. U. K. Pillai & S. C. Saren; Dec 2022.

Results

Taxonomic studies and the systematic position of this species have been provided below.

Class-Actionopterygii

Order-Gobiiformes

Family-Gobiidae

Subfamily- Gobiinae

Genus-*Acentrogobius*

Species identified-*Acentrogobius nebulosus* (Forsskal, 1775) (Shadow Goby) (Final 2)

1775. *Gobius nebulosus* Forsskal, Descript. animal. (Forsskal):24 (type locality: Red Sea, Saudi Arabia Djidda [Jeddah]).

Distribution: This particular species of gobiid fish is found to be abundant in the Indo-West Pacific region: From East Africa going through Indonesia to Micronesia, on the northern side of China and Ryukyu Islands (Roy *et al.*, 2019).

Description: Body depth is about 4.5 in Standard Length and Head Length is about 3.4-3.5 in Standard Length. Snout is measured to be shorter than the eye with an eye diameter of 2.6 in Head Length and Snout Length of about 3.4-3.6 in Head Length. Inter-orbital space is 3.68-3.77 in Eye Diameter. Pre-dorsal Length is about 2.8 and Pre-Anal Length is about 1.6-1.7 in Standard Length. Pectoral fin Length is about 3.5-4.3 in Standard Length and caudal peduncle depth is about 1.6-1.7 in Standard Length. The two small-sized fish have stout bodies, which are cylindrical in their anterior portion and compressed in their posterior portion. The head is slightly compressed in shape and consists of large eyes. The cheek and operculum are naked and the maxilla is short. The upper jaw consists of several rows of teeth. The dorsal fin consists of 6 soft spines and 9 soft rays. The anal fin has 1 soft spine and 9 soft rays, pectoral fin is with 19 rays. Longitudinal and transverse lateral scales are 30 and 11, respectively for both the specimens (Table 1).

Table 1. Morphometric characters of Specimen 1 and 2

Characters	Specimen1 (Okha)	Specimen2 (Salaya)
Standard Length	74.7 mm	62.2 mm
Head Length	21.5 mm	18.1 mm
Body depth	16.5 mm	13.6 mm
Eye diameter	8.1 mm	6.8 mm
Snout Length	5.9 mm	5.3 mm
Inter-Orbital Space	2.2 mm	1.8mm
Pre-dorsal Length	26 mm	21.8 mm
Pre-anal Length	45.2 mm	36.4 mm
Pectoral Fin Length	21.2 mm	14.4 mm
Pelvic Fin Length	19.7 mm	16.2 mm
Caudal Fin Length	18.2 mm	15.5 mm
Caudal peduncle Depth	8.7 mm	6.9 mm
Caudal peduncle Length	13.7 mm	11.4mm

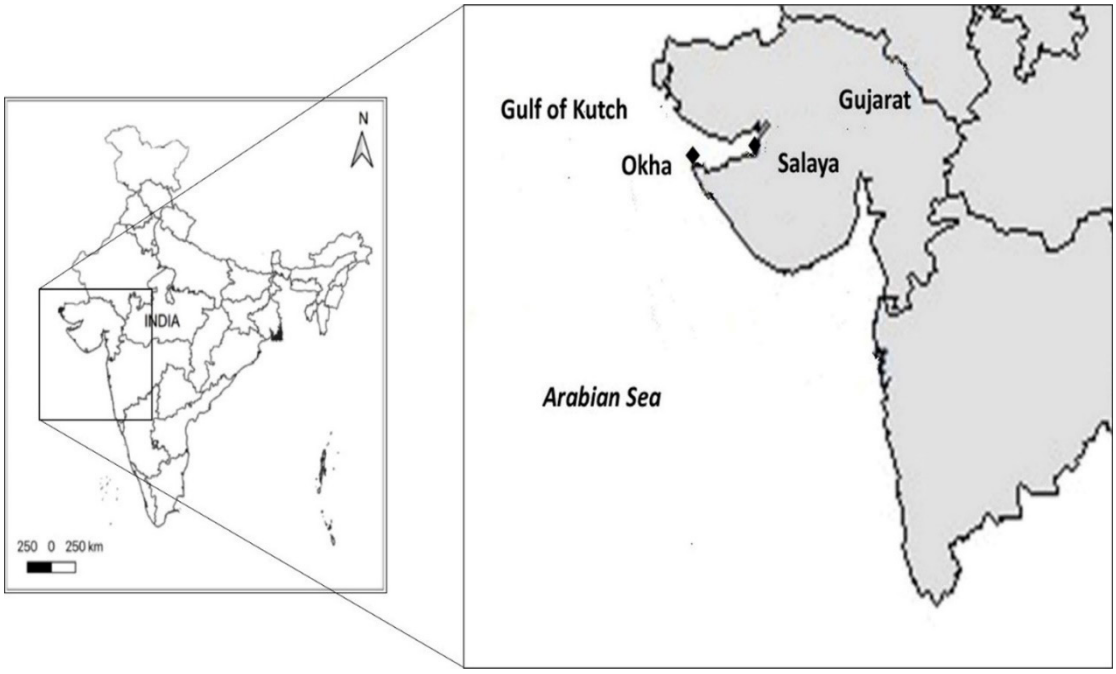

Figure 1. Study area and location map

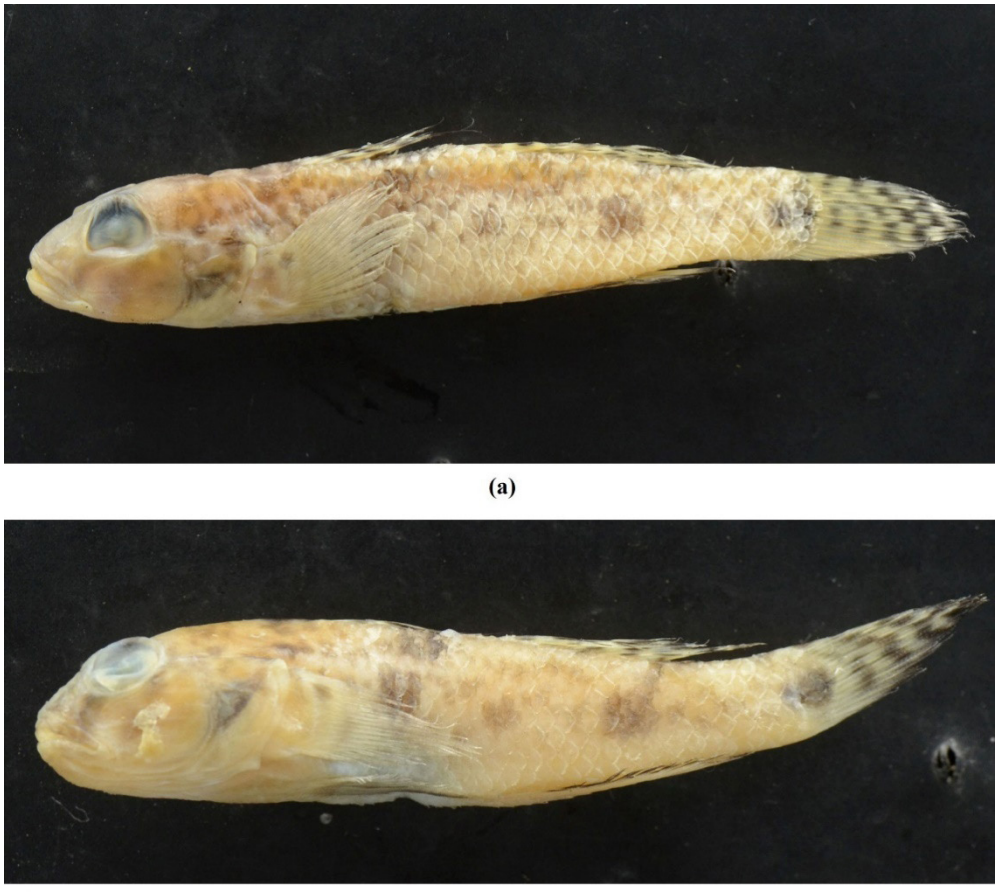

Figure 2. *Acentrogobius nebulosus* (Forsskal, 1775) (a & b) Okha (74.7 mm SL; ZSI F15882/2) and Salaya (62.2 mm SL; ZSI F15883/2) specimens respectively.

Discussion

Acentrogobius nebulosus (Forsskal, 1775) was first reported from Red Sea, Jiddah, Saudi Arabia in 1775 by Forsskal. In India, *Acentrogobius nebulosus* was reported from Kerala, Karnataka, Maharashtra, Tamil Nadu, Andhra Pradesh, Orissa and Andaman Islands (Cuvier & Valenciennes, 1837; Cantor, 1850; Day, 1865; Günther, 1861; Day, 1876; Koumans, 1941; Talwar & Jhingran, 1991; Devi, 1992; Barman *et al.*, 2013; Sundaram *et al.*, 2014; Roy *et al.*, 2019). Its original name was *Gobius nebulosus* Forsskal, 1775. From Indian waters, it was recorded as *Gobius criniger* Valenciennes, 1837 from Malabar (Cuvier & Valenciennes, 1837). *Gobius criniger* was later reported as *Ctenogobius criniger* (Valenciennes, 1837) by Koumans (1941) with his studies on specimens from Kerala, Tamil Nadu, Andhra Pradesh and Andaman. The same species was listed as *Yongeichthys criniger* (Valenciennes, 1837) by Devi, 1992, from the Ennore estuary, Tamil Nadu, following Talwar and Jhingran (1991). Later, this species was considered a synonym for Yongeichthys *nebulosus* (Forsskal, 1775) by Kottelat, 2013. However, in the current system of nomenclature (Froese & Pauly, 2023), *Yongeichthys nebulosus* is considered as *Acentrogobius nebulosus*. The present study records the occurrence of *Acentrogobius nebulosus* for the first time in the state of Gujarat, India.

Acknowledgements

The authors are grateful to Dr. Dhriti Banerjee, Director, Zoological Survey of India, for providing all the necessary facilities. Also, we thank Dr. L. Kosygin Singh (OC, FPS building ZSI, Kolkata) for the necessary help and support. The authors are grateful for the help rendered by all other staff in the Marine Fish Section, ZSI.

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