

First Record of Snakehead gudgeon *Giuris tolsoni* (Bleeker, 1854) (Gobiiformes: Eleotridae) from Indian waters

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ABSTRACT: The present study reports the occurrence of Snakehead gudgeon *Giuris tolsoni* (Bleeker, 1854) (Order-Gobiiformes) under the family Eleotridae for the first time from Andaman and Nicobar islands, India. Two specimens (Standard length ranges from 6.55 to 8.05 cm) were collected in January 2022 from the Great Nicobar Island. The new India records expand the known distribution of *G. tolsoni*, which had previously been reported from Indonesia, Philippines, Taiwan and Japan only is a new addition to the list of freshwater fishes from Indian waters. This study will be helpful in further study of its biology, zoogeography and taxonomic status of the family Eleotridae. The species is discussed herein with its morphometric and meristic characteristics.

Keywords: *Giuris tolsoni*, new record, Eleotridae, Andaman and Nicobar Island, India.

INTRODUCTION

The family Eleotridae distributed worldwide and found mostly in freshwater and mangrove environments (Nelson *et al.*, 2016). The species of this family are small to moderate gobioid fishes having short and stout body covered with scales; a series of sensory canals, pores and cutaneous papillae on head; two dorsal fins and well separated pelvic fins and with no lateral line system (Larson and Murdy 2001). The family Eleotridae has 192 valid species under 34 genera worldwide (Fricke *et al.*, 2022a). From India waters, only 18 species under 11 genera were found (Gopi and Mishra 2015). The species of the genus *Giuris* Sauvage, 1880 species are colourful freshwater eleotrids found in insular habitats of the tropical Indian and Pacific oceans. They generally inhabit coastal streams from estuaries to lower parts of rivers, or in lakes, usually in bank vegetation and in shelters over rocky or gravel bottoms. Presently there were eight valid species are recognized in the genus *Giuris* (Keith and Mennesson 2020). Among these, only one species, i.e. *Giuris margaritaceus* (Valenciennes, 1837) have hitherto been recorded from Indian waters (Kapoor *et al.*, 2002 and Rajan *et al.*, 2013). The present study reports the occurrence of *Giuris tolsoni* (Bleeker, 1854) for the first time from India water based on two specimens collected from the Juginder Nagar area of Great Nicobar Island, Andaman and Nicobar Islands of India.

MATERIAL AND METHODS

A survey was undertaken to study the faunal diversity of Great Nicobar Island from 4-26 January 2022.

During the survey two goby fish specimens were collected by using cast net from a pond in Juginder Nagar (6°57.1798' N and 93°55.4043' E), Great Nicobar, Nicobar district of Andaman and Nicobar Islands (Fig. 1), India on 16th January 2022. After the collection, the fishes were photographed, and preserved in 70% ethanol solution. The identification of the specimens was based on the morphometric and meristic characters (Keith and Mennesson 2020; Keith *et al.*, 2020). All measurements were taken to the nearest 0.1 mm using digital caliper, and the results were expressed in % Standard length (Greenfield and Randall 2018). Classification of the species based on Catalog of Fishes (Fricke *et al.*, 2022b). The identified specimens were registered and deposited in the National Zoological Collections of Andaman & Nicobar Regional Centre, Zoological Survey of India, Port Blair, India.

RESULTS AND DISCUSSION

Taxonomic Classification

Class: ACTINOPTERYGII Klein, 1885

Order GOBIIFORMES Gunther, 1880

Family ELEOTRIDAE Bonaparte 1835

Genus *Giuris* Sauvage, 1880

Giuris tolsoni (Bleeker, 1854)

1854. *Eleotris tolsoni* Bleeker [P.] 1854:542 [Natuurkundig Tijdschrift voor Nederlandsch Indië v. 6 (no. 3)] Holotype RMNH 5180(1 of 17), Type locality: Near Djung-Kulon (Djunkulon), extreme western Java, Indonesia.

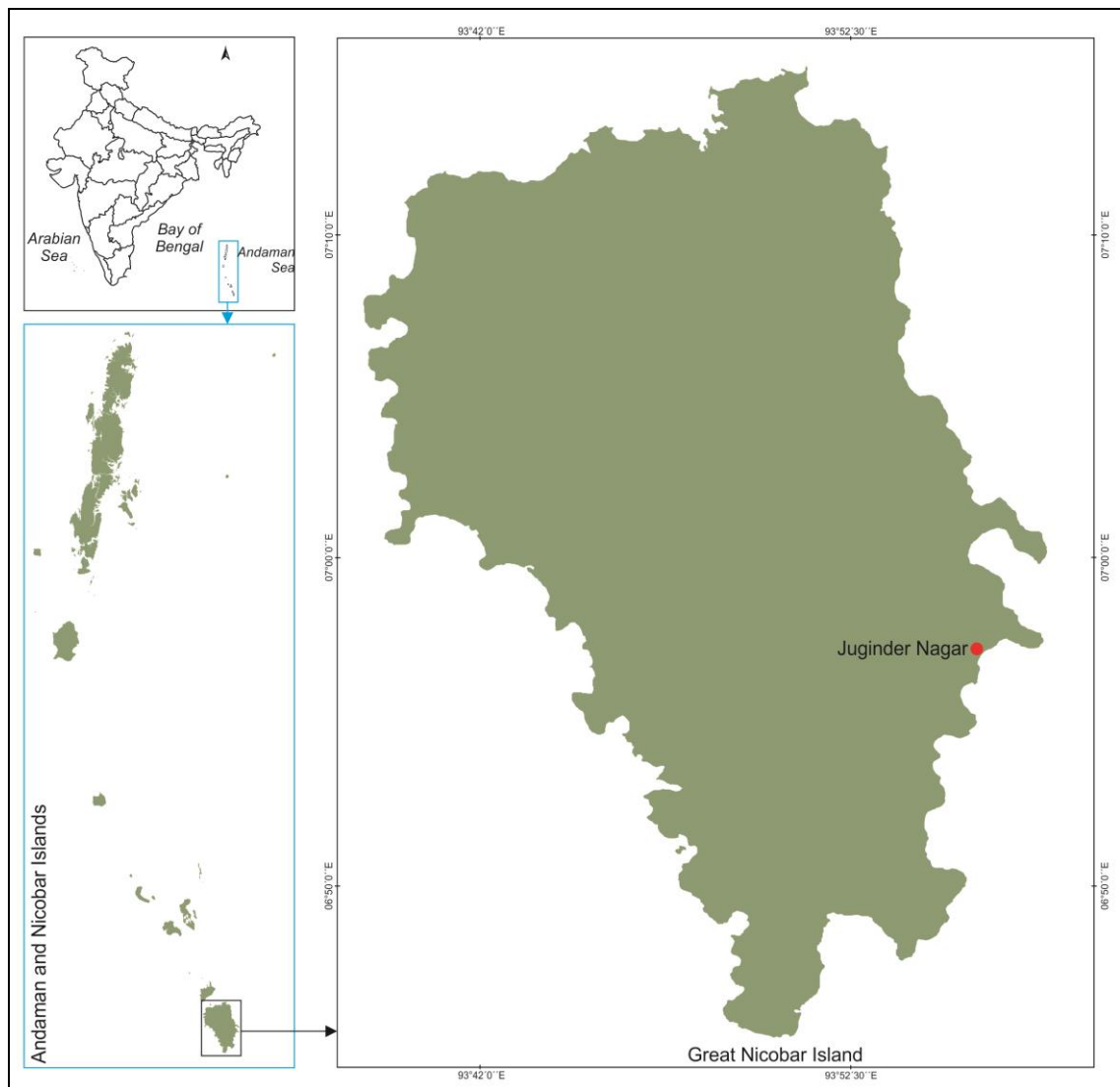


Fig. 1 Map of Andaman and Nicobar Islands, India showing the sampling area of *Giuris tolsoni* (Bleeker, 1854) in Great Nicobar Island.

Material examined. ZSI/ANRC/M/28141, 2 ex. 65.5 – 80.5 mm SL, Juginder Nagar, Great Nicobar (6°57.1798' N, 93°55.4043' E) 16.01.2022, Coll: Mrinal Kumar Das

Diagnostic characters: The meristic and morphometric data of the fish specimens are listed in Table 1.

D VI + I, 8; A I, 9; P 14; V I, 5; C 15. First dorsal fin with six spines, second dorsal fin is with one spine and 8 soft rays. In first dorsal fin, second, third and fourth rays are longer. Anal fins with one spine and 9 soft rays. The anal fin is directly opposite to the second dorsal fin. The caudal fin is with 15 branched rays and its posterior margin is rounded. Pelvic fin separated with one spine and 5 soft rays. Pectoral fin with 14 rays. Lateral line scale 30, Dorsal fin to lateral line the number of scales 4 and predorsal scales 16. Body with ctenoid scales on flanks and caudal peduncle. Cycloid scales from snout to top of head and anterior

part of first dorsal fin, operculum, base of pectoral fins and on belly extending to anus. Scales of top of head and back is greater than those of belly. Morphologically, its body is more ovoid than elongated. The body depth at first dorsal fin 21.2 – 23.7 in % SL, at anus is 19.56 -21.6 in %SL, and at the caudal peduncle depth is 13.6 -15.2 (% SL). Predorsal length 39.8 - 46.2 (% SL) and preanal length 60.2 - 67.6 (% SL). Size: up to 10.4 cm SL. The head is depressed; its length is 31.9 – 34.8 in % SL. The snout is convex. The anterior nostrils are short, not reaching upper margin of upper lip. Mouth and jaw length (9.6 -10.2 % SL) small. Teeth are inwardly curved on both the jaws and larger on outer row. Eye diameter 6.16 - 6.7 in % SL and Interorbital length is narrow (9.2-11.4 % SL). Oculoscapular canal and supratemporals are absent and a short preopercular canal with pores N' and O' is present. Morphometric and meristic data presented in Table 1.

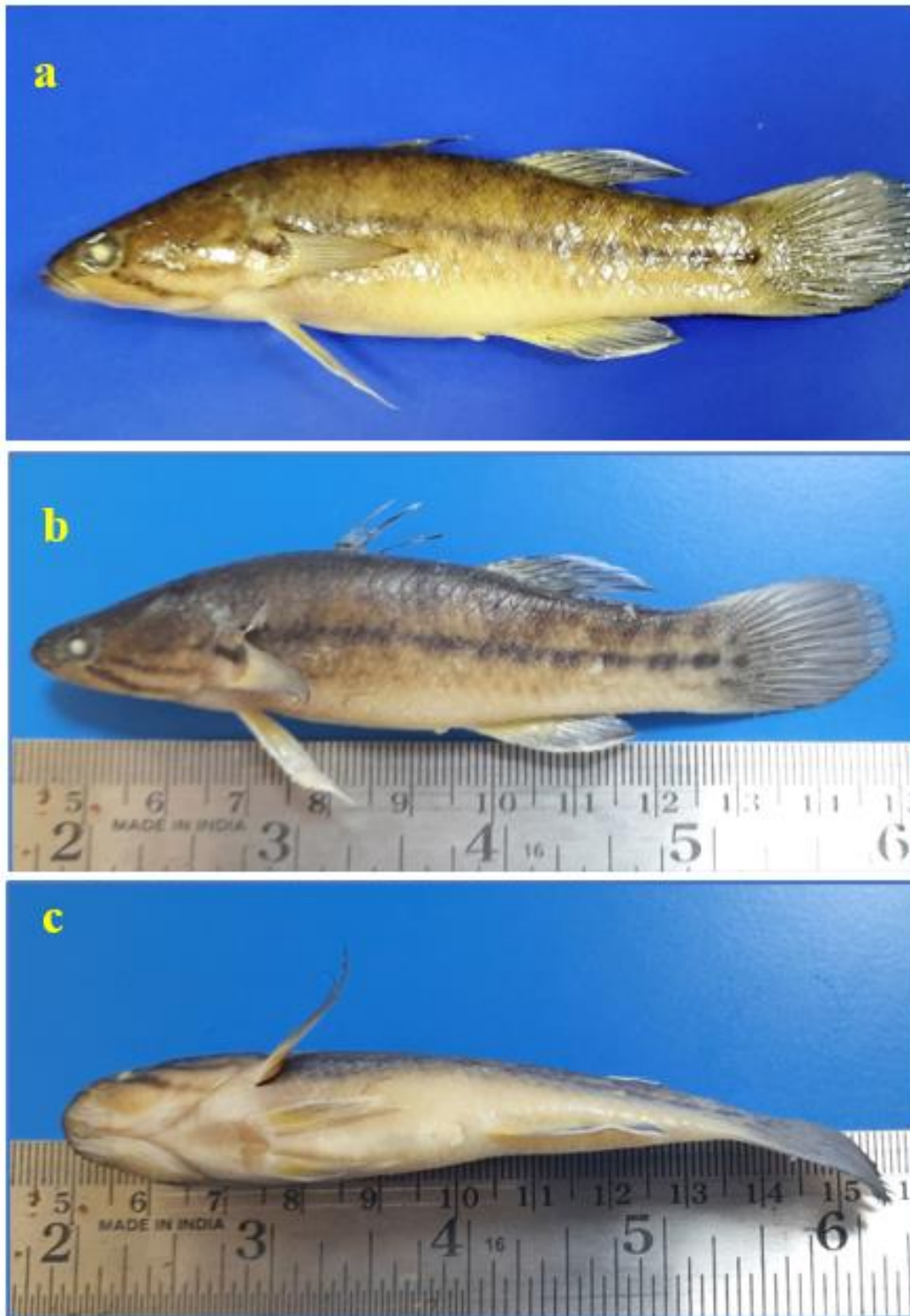
Table 1: Morphometric measurements of *Giuris tolsoni* (Bleeker, 1984) collected from Great Nicobar Island, Andaman and Nicobar Islands, India.

Morphometric character (mm)	Absolute value		% SL	
	Range	Mean	Range	Mean
Total Length	83.9 - 104.5	94.2		
Standard length	65.5 - 80.5	73.0		
Head length			31.92 - 34.81	33.36
Head width			16.81 - 18.55	17.68
Head depth			15.79 - 19.25	17.52
Snout length			7.25 - 7.77	7.51
Eye diameter			6.16 - 6.70	6.43
Interorbital width			9.24 - 11.49	10.36
Jaw length			9.61 - 10.20	9.9
Body depth at first dorsal fin			21.21 - 24.22	22.71
Body depth at pelvic-fin origin			17.64 - 22.36	20.0
Body depth at anal-fin origin			19.56 - 21.83	20.69
Pre dorsal length			39.88 - 46.20	43.04
Pre anal length			60.2 - 67.6	63.9
Pre pelvic length			29.34 - 32.75	31.25
Caudal peduncle length			28.92 - 30.40	29.66
Caudal peduncle depth			13.67 - 15.18	14.42
Length of 1st dorsal-fin base			11.0 - 11.64	11.32
Length of 2nd dorsal-fin base			13.78 - 14.12	13.95
Length of anal-fin base			13.96 - 15.23	14.59
Pectoral fin length			19.10 - 20.20	19.65
Pelvic fin length			20.40 - 21.87	21.13
Caudal fin length			26.24 - 26.51	26.37
1st dorsal fin 1st spine length			11.12 - 11.44	11.28
1st dorsal fin 2nd spine length			12.10 - 12.57	12.33
1st dorsal fin 3rd spine length			12.68 - 13.58	13.13
1st dorsal fin 4th spine length			12.65 - 12.88	12.76
2nd dorsal fin 1st spine length			9.58 - 11.79	10.68
2nd dorsal fin longest ray length			15.33 - 15.36	15.34
Anal spine length			7.90 - 12.76	10.33
Length of 1st anal fin ray			12.04 - 12.76	11.4
Length of pelvic fin spine			8.81 - 11.98	10.39
4th pelvic-fin ray length			18.55 - 19.74	19.14
5th pelvic-fin ray length			15.47 - 20.08	17.77

Coloration: Body light brown on the back to bright beige and yellow on the flanks. Lateral part brownish in colour with 3 thin red stripes radiating from the eye to the cheeks and operculum. Belly white and top of the head is brownish, with several small reddish dots, lateral part greyish to bluish, the first or two highest continuing on the pectoral base. Small alternating reddish to bluish rounded patches along the flanks from pectoral base to hypural base, forming a medium straight band. The first dorsal fin is translucent with yellow stripes in the medium part. The second dorsal fin yellowish at the base with a thin white stripe at the distal tip. The anal fin base is yellow in colour with a distal white stripe. Pelvic fins light yellowish with a

white distal margin Pectoral and caudal fins are hyaline in colour (Fig. 2).

The presently reported record of *G. tolsoni* is the first documentation of the species from Indian waters. The specimen was identified as *G. tolsoni* based on diagnostic characters presented in the results. At present eight species are recognized within the genus *Giuris*. One widespread in the Indo-Pacific species *Giuris margaritaceus* (Valenciennes, 1837) found in marine, brackish, and fresh waters. Other species of the genus are *Giuris tolsoni* (Bleeker, 1854) *Giuris aporocephalus* (Macleay, 1884), *Giuris laglaizei* (Sauvage, 1880), and other four species are recently described and placed in this genus by Keith and his team.



(a- Freshly dead specimen, b- Preserved specimen, c- ventral side of fish showing separated pelvic fin).

Fig. 2. *Giuris tolsoni* (Bleeker, 1854), ZSI/ANRC/M/28141 (104.5 mm) from Great Nicobar, India.

These are *Giuris viator* Keith, Mennesson, Lord and Hubert (2020), *Giuris yahayai* Keith and Mennesson 2020, *Giuris charpini* Keith and Mennesson (2020), and *Giuris causei* Keith, Mennesson and Lord (2020). The species *G. tolsoni* (Bleeker, 1854), *G. aporocephalus* (Macleay, 1884), *G. laglaizei* (Sauvage, 1880) were redescribed (Keith and Mennesson 2020; Keith *et al.*, 2020). The fish *G. tolsoni* has a medium straight band from pectoral base to hyporal base. This

species has similarity with *G. margaritaceus* for which it was misidentified earlier. The comparison between these two species given by Keith *et al.*, 2020 which shows that *G. tolsoni* has 6-8 scales around the eye (vs 8-11 scales in *G. margaritaceus*) around the eye, always 14 soft-rays in pectoral fin (vs 15 in *G. margaritaceus*) and smaller Interorbital length i.e 9-11.4%SL (12-14% SL in *G. margaritaceus*). Among other *Giuris* species, *G. tolsoni* resembles only *Giuris*

viator in having 14 soft fin-rays in the pectoral fin (vs. 15 in other species), but differs from *G. viator* in having lesser scales around the eye (6-8 vs. 10-13), a smaller body depth at anus (vs. 16-22 vs. 21-24 % SL) and by the colourful pattern of male (Keith *et al.*, 2020). *Giuris tolsoni* has been reported from Indonesia (Bali, Lombok, Halmahera, Sulawesi), Philippines, Japan and Taiwan (Keith *et al.*, 2020) so far. The present report confirmed the first occurrence and distribution of the species *G. tolsoni* in Andaman and Nicobar Islands, India waters and second record of the snakehead gudgeon Genus *Giuris* from India.

CONCLUSION AND FUTURE SCOPE

The present study reports the new record of *Giuris tolsoni* (Bleeker, 1854) from Andaman and Nicobar Islands, India. This is the first distributional record of the Family Eleotridae, Genus *Giuris* and the species i.e. *Giuris tolsoni* (Bleeker, 1984) in the Indian Waters. The current study will help the freshwater fish researchers in future for conserving the genetic data and creating its fishery potential for socioeconomic development.

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Conflict of Interest. Authors don't have any conflict of interest.

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