



NEW RECORDS OF TWO REEF FISHES *GYMNOTHORAX RETICULARIS*, BLOCH, 1795 (FAMILY: MURAENIDAE) AND *SCARUS GHOBAN*, FORSSKAL, 1775 (FAMILY: SCARIDAE) FROM WEST BENGAL COAST, INDIA

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INTRODUCTION

There are numerous studies carried out so far on Ichthyofaunal diversity of West Bengal (Manna and Goswami, 1985; Goswami, 1992; Talwar *et al.*, 1992; Chatterjee *et al.*, 2000; Das *et al.*, 2007, Yennawar *et al.*, 2011) which did not report the occurrence of Indo-Pacific Banded Eel *Gymnothorax reticularis*, Bloch, 1795; family Muraenidae and Blue-Barred Parrotfish *Scarus ghobban*, Forsskal, 1775 of family Scaridae recently collected from West Bengal coastal waters.

The fish diversity of West Bengal was recently encountered by Talwar *et al.*, (1992) reports the 7 species, Goswami (1992) reports one species, Chatterjee *et al.*, (2000) 3 species, Das *et al.*, (2007) reports the 11 species and Yennawar *et al.*, (2011), 2 species of family Muraenidae from the West Bengal coastal water. The Parrot fishes, family Scaridae represented by 2 subfamilies, 10 genera and 95 species throughout the world (Froese & Pauly, 2011 & Nelson, 2006), there are 18 species and 6 genera belonging to 2 subfamilies known to occur in Indian coastal water (Barman and Misra, 2005).

The present paper reports new distribution record of *G. reticularis*, Bloch; 1795 and *S. ghobban*; Forsskal, 1775 in the coastal waters of West Bengal

and compares the distinguishing features with other matching species of family whereas the family Scaridae was reported for first time from the coastal water of West Bengal.

MATERIALS AND METHODS

2 examples of *Gymnothorax reticularis* and 2 examples of *Scarus ghobban* are collected from locality Digha Mohana (21°37.843'N and 87°32.827'E). Both the specimens were caught in trawler operated by local fisherman during their regular fish catching. One example of *G. reticularis* was displayed in the Marine Museum of Marine Aquarium and Regional Centre, Zoological Survey of India, Digha and Reg. no. ZSI/MARC F1586, date of collection 29.11.2010. Other example was displayed at the Museum of Experimental Prawn Hatchery, Department of Fisheries, W. B. Digha, Regd no. ZSI/MARC F1970 collected on May 2010. Counts of the bars and measurements were followed as Smith & Bohlke (1997). Proportional measurements were given in total length (TL) and head length (HL). The measurements of total length (mm), distance from snout to anus, head length, depth at anus, snout length, eye diameter, and distance from snout to rectus of mouth were carried out. Vertebral counts were calculated by manually counting vertebrae from X-Ray film and recording the number of vertebrae anterior to the

origin of the dorsal fin, the number of vertebrae anterior to the origin of the anal fin and the total number of vertebrae as described by Smith & Böhlke (1997).

Both the examples of *S. ghobban* are collected during June 2011 and deposited in the collection of Marine Museum of Marine Aquarium and Regional Centre, Zoological Survey of India, Digha, and Reg. No: F1850 & F1892. All external morphological measurements are given in Table.1 and Table.2 respectively. All the measurements are done by Dial caliper in millimeter scale and photograph are taken Nikon D90 SLR camera.

1. Indo-Pacific Banded Eel *Gymnothorax reticularis*, Bloch, 1795

SYSTEMATICS ACCOUNTS

Class: **ACTINOPTERYGII**

Sub Class: **NEOPTERYGII**

Division: **TELEOSTEI**

Sub Division: **ELOPOMORPHA**

Order: **ANGUILLIFORMES**

Family: **MURAENIDAE**

Sub-Family: **MURAENINAE**

Genus: *Gymnothorax* Bloch 1795

***Gymnothorax reticularis* Bloch 1795**

Synonyms

1877. *Muraena reticularis* Day, *Fishes of India*: vol. 1. p. 669.

1916. *Muraena (Priodonophis) reticularis* Weber & Beaufort, *The fishes of Indo-Australian Archipelago*, vol III, p.387-389.

1984. *Gymnothorax reticularis* Talwar, & Kacker, *Commercial Sea Fishes of India*: p. 221-222.

Diagnostic Characters : 15 - 18 bars, total vertebrae 115-119. Dorsal fin starts before the gill opening from head. Colour pattern of this species very distinct which was quite different from other species in the group. The brown spots on the head and chin tend to be drawn out longitudinally, separated by narrow pale interspaces gave an appearance of horizontal lines, which forms the reticulated structure especially on the branchial region. The spotting on the body is sharply

restricted to the dorsal half of the body, and the spots continuous, i.e. pale on the dark bars and dark on the interspaces. Body behind the gill opening with 15-18 bars, continuous across dorsal and ventral midlines, pigmentation more prominent in the dorsal region specially in margins of fins. Body had distinct bars due to the small white spots appears in regular interval forming the dorsal bands.

Distribution : In India, it is reported from Coromandal coast (Smith & Böhlke, 1997), Visakhapatnam (Krishnan & Mishra, 1993), Andhra Pradesh (Barman *et al.*, 2004), Tamilnadu (Nagabhushanam & Krishnan, 1993), Puducherry and Karaikal (Mishra & Krishnan, 2003) and present specimen was from Digha Mohana, West Bengal, so its distribution over the entire east coast of India. Elsewhere, Red Sea, Gulf of Aqaba (Smith & Böhlke, 1997), Indonesia (Allen & Erdmann, 2009), South China Sea, Hong kong (Ni & Kowk, 1999) and Indo-Pacific.

2. Blue-Barred Parrotfish *Scarus ghobban*, Forsskal, 1775

Order: **PERCIFORMES**

Family: **SCARIDAE**

Sub-Family: **SCARINAE**

Genus: *Scarus* Forsskal, 1775

***Scarus ghobban* Forsskal, 1775**

Synonyms

1877. *Pseudoscarus ghobban* Day, *Fishes of India*: Vol.1, p. 412.

1984. *Scarus ghobban* Talwar & Kacker, *Commercial Sea Fishes of India*: p.759.

Diagnostic Character : Meristic Formula: D: IX, 10; A: III, 9; P: 14; V: I, 5; LL: 24; GR: 45 (28+17).

Diagnosis: Median pre-dorsal scale 6 (4th scale largest), three rows of scale on cheek and upper row with 6-7 scales, more than half of dental plate cover by lips. Posterior nostril larger than anterior nostril, caudal fin truncate with lobes. Dorsal fin sub-equal and flexible, rays slightly longer than spines. Spines of first anal fin were minute, third

Table 1: Morphometric characters of *Gymnothorax reticularis*.

S.No.	Character	Measurement
1	Total length (TL) (mm)	288-304
2	Snout-anus (%TL)	2.00-2.06
3	Head length (HL) (%TL)	5.62-6.13
4	Depth at anus (mm)	22-24
5	Eye (%HL)	7.23-9.33
6	Snout-eye (%HL)	6.71-7
7	Predorsal vertebrae	5-6
8	Preanal vertebrae	48-49
9	Total vertebrae	115-119

Table 2: Comparison of morphometric characteristics of the Blue-Barred Parrotfish *Scarus ghobban*.

Character	Initial phase	Terminal phase
Total Length (TL)	299 mm	516 mm
Standard Length (SL)	248 mm	450 mm
Head Length (HL)	80 mm	134 mm
Caudal fin length	51 mm	66 mm
Dorsal fin base length	114 mm	215 mm
Anal fin base length	57 mm	98 mm
Pectoral fin length	55 mm	88 mm
Ventral fin Length	43 mm	66 mm
Eye diameter (ED)	12mm	19 mm
Inter orbital space (IOS)	37 mm	62 mm
Body Depth(BD)	84 mm	153 mm
Snout Length (Sn)	31 mm	51 mm
TL/HL	3.73	3.85
SL/HL	3.1	3.35
TL/BD	3.51	3.51
SL/BD	2.94	2.95
HL/ED	6.95	7.05
HL/IOS	2.16	2.16
HL/Sn	2.58	2.68

longest, rays longer than third spine. The morphometric measurements of two different phases are given in Table 2. Among the two examples, one example was observed in Initial Phase (IP) (Fig. 2a) and another was in Terminal Phase (TP) (Fig. 2b). The differentiation of two phases were observed with 2 canines on upper dental plate and slightly emarginated caudal fin in IP which became lunate in the TP males.

Colouration pattern: Initial Phase: Body and median fin light gray overall; Scales on body bluish, white or pale red on thorax; 5 diffuse blue bands on dorsum not extending to ventral mid-line; head yellow to orange; broad blue bar across snout and chin with irregular blue spots on throat; blue line from mouth to orbit; dental plates white; usually 2 pale streaks on abdomen extending from base of pectoral to origin of anal fin; median fins blue basally, orange centrally with blue outer margins; caudal orange-yellow with broad blue upper and lower margins; pectoral pale yellow with upper margin blue; pelvic fins yellow-white with blue anterior margin.

Terminal phase: Head and body green dorsally; each scale narrowly edged with salmon pink or orange; green becoming progressively reduced ventrally; cheek and operculum pale orange; chin throat and isthmus blue-green; upper lip orange with green band on snout; lower lip orange followed by green bar; chin with irregular series of green bars; green markings from mouth to orbit, and surrounding orbit as in blue markings of IP, interspaces between postorbital bars pink; median fins orange to pink with broad blue-green distal margin and green base; caudal fin green with band of salmon pink in each lobe; pectoral fins blue-green with broad orange to pink streak extending from midbase to tips of longest rays; dark spot at upper pectoral base; pelvic fins salmon pink with broad blue anterior margin; dental plates pinkish, white at edges.

Distribution : From Indian waters this species was reported from Andaman and Nicobar Island (Rao, 2003 & Rao *et al.*, 2000), Andhra Pradesh (Barman *et al.*, 2004), Tamil Nadu (Krishnan *et al.*,

2007), Gulf of Mannar (Varghese *et al.*, 2011), Laccadives (Murty, 2002). Elsewhere, Indo-Pacific: Red sea and Algoa Bay, South Africa to Rapa and Ducie Island, north to southern Japan, south to Perth, New South Wales and India (Rajan, 2010).

DISCUSSION AND CONCLUSION :

The present species was *G. reticularis* Bloch, 1795, which was so long been always confused with another similar species, *G. minor* (Temminck and Schlegel, 1846). There are other five species which are similar with the *G. reticularis* in color pattern in which dark bands on a pale background and teeth are finely serrated. These five species are *G. annulatus* (Smith and Bolhke, 1997), *G. chlamydatus* (Snyder, 1908), *G. mcoskeri*, *G. punctatofasciatus* (Bleeker, 1863), *G. randalli* (Smith and Bolhke, 1997), *G. enigmaticus* (McCosker & Randall, 1982). From the literature study it is observed that, *G. reticularis* is very similar and confused with the *G. minor* from the Western Pacific and Australia, but it is different in color pattern and vertebral count. *G. minor* have the vertebral count of 129-143 whereas *G. reticularis* have 114-126 (Smith & Böhlke, 1997).

In case of *S. ghobban*, the color pattern varies between different growth stages and sexes. The initial phase, IP, includes the female and primary male; the terminal phase, TP, represents secondary males after a sex change. Most scarids are protogynous hermaphrodites and undergo a complex series of colour pattern changes associated with their sexual ontogeny. There are

typically three distinct colour phases: the juvenile phase, initial phase (IP) and terminal phase (TP).

As a result, scarids are a major bioeroding agent on coral reefs. It has been estimated that up to 9 kg/m²/yr may be removed by scarid grazing on the Great Barrier Reef (Kiene, 1988). There have been several reports of scarids feeding on live corals (Hiatt & Strasburg, 1960; Glynn *et al.*, 1972; Frydl, 1979). The close observation of the present species also shows that the species was equipped with strong dental plates and capable scrapers of reef.

The recent studies along the Digha coast of West Bengal reported few more coral reef inhabitant fishes. These species are reported first time in Digha waters and are significant records of the area since there is no reef in the vicinity. The presence of this species along with few other reef dwellers focus on the need of further studies on their behavioral patterns and proximity of reefs in the nearby area.

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Fig. 1a: *Gymnothorax reticularis* (Bloch, 1795)



Fig. 1b: Reticulated head of *Gymnothorax reticularis* (Bloch, 1795).



Fig. 2a : Initial Phase: Blue-barred parrotfish, *Scarus ghobban* Forsskal, 1775



Fig. 2b : Terminal Phase: Blue-barred parrotfish, *Scarus ghobban* Forsskal, 1775