
Occurrences of seven new records of goat fishes (family: Mullidae) from the coastal waters of West Bengal, India

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ABSTRACT

Thirty eight fish specimens of family Mullidae were collected during the ornamental faunal survey around the West Bengal coast. All these specimens were identified into seven species which are addition to the faunal resource of West Bengal. These seven species are: *Perupeneus heptacanthus* (Lacepede, 1802), *Upeneus guttatus* (Day, 1868), *Upeneus luzonius* (Jordon and Seale, 1907), *Upeneus molucensis* (Bleeker, 1855), *Upeneus sundaicus* (Bleeker, 1855); *Upeneus taeniopterus* (Cuvier, 1829) and *Upeneus tragula* (Richardson, 1846). The present paper gives the detailed description of all these seven species from West Bengal for the first time.

Key words: Mullidae, Digha Mohona, *Perupeneus*, *Upeneus*, New record.

Introduction

The goatfishes of family Mullidae are commercially important demersal fish group (Sabrah and El-Ganainy, 2009) and are widely distributed in the Indo-Pacific Region in estuaries and shallow coastal water (Barman and Misra, 2007). Some of the species are of economic importance and form also minor fishery along the coast of India (Thomas, 1969). Apart from the economic importance, goatfishes are suitable habitat indicators and may also qualify as key species in coastal sand-associated ecosystems (Uiblein, 2007). The family Mullidae consists of 6 genera (*Mullus*,

Upeneus, *Parupeneus*, *Mulloidichthys*, *Upenichthys* and *Pseudupeneus*) with 67 species of which only 3 genera (*Upeneus*, *Mulloidichthys* and *Parupeneus*) comprising 18 species of are reported from India (Barman and Misra, 2007), however, 2 more species recently added in the area (Fishbase, 2010).

Ichthyological faunal diversity of Digha, one of the most renowned fish landing center of eastern India, has been given prime focus for the Ichthyologic faunal diversity of the region. Various studies have been carried out to study the fish faunal diversity of this region (Manna and Goswami, 1985; Goswami, 1992; Talwar et

al.,1994; Chatterjee *et al.*,2000; Yennawar and Tudu, 2010). All these reports together reported 3 species under family Mullidae, which are *Parupeneus indicus* (Shaw, 1803), *Upeneus vittatus* (Forsskal, 1775) and *Upeneus sulphureus* Cuvier, 1829.

In the present paper, we provide brief species description of 7 species of fishes from family: Mullidae which are addition to the faunal resource of West Bengal. These seven species are: *Parupeneus heptacanthus* (Lacepede, 1802), *Upeneus guttatus* (Day, 1868), *Upeneus luzonius* (Jordan and Seale, 1907), *Upeneus molucensis* (Bleeker, 1855), *Upeneus sundaicus* (Bleeker, 1855); *Upeneus taeniopterus* (Cuvier, 1829) and *Upeneus tragula* (Richardson, 1846).

Materials and Methods

During local survey around Digha coast authors collected some goatfishes from Digha Mohona. The specimens were preserved in 10% formalin after taking the fresh photographs. For proper identification taxonomic key follow by Barman and Mishra, 2007. After collection photograph was taken. The detail of morphometric measurements and identification work was carried out in laboratory of Marine Aquarium and Regional Centre. Abbreviations SL and HL represents standard length and head length.

Result and Discussion

In total 38 specimens of family Mullidae were collected during the survey and categorized as 7 specimens and all the seven species are new to the state fauna of West Bengal. The details of morphometric measurement of the collected specimens were given in Table-1.

Classification

Class: Actinoptergii
Order: Perciformes
Family: Mullidae

1. *Parupeneus heptacanthus* (Lacepede, 1802), Cinnabar goatfish.

Material examined:

2 ex, SL: 89-123, Location: Digha Mohana, Date:25.02.2011, Reg. No. F786.

Synonyms:

1802. *Sciaena heptacanthus* Lacepede, Hist. Nat. Poiss., 4: 308, 311 (type –locality: No locality given).

1958. *Pseudupeneus pleurospilos*: Balan, J. Bombay nat. Hist. Soc., 55(2) :301.

Character:

D: VIII+I,8, A:I, 7 , P: 16 , V: I, 5 , GR: 25 , LL: 28, Body elongate, depth 3.15-3.87 times in standard length. A pair of chin barbel extend to rear border of pre-opercle, their length 1.22 times in head length. Proportion of eye diameter to head length is 3.69-3.75 and proportion of head length to standard length is 3.23-3.29. The interdorsal space is separated by 3 vertical rows of scales. First dorsal spine small and third dorsal spine longest. Nine vertical rows of scale in upper part of caudal peduncle. A single row of conical teeth on jaw and no teeth on the roof of the mouth. Body yellowish red in colour a small reddish brown spot below the first dorsal fin and just below seventh and eighth lateral-line scales. 3 faint iridescent blue lines extending and from eye (Fig.1). Second dorsal and anal fins with pink narrow bands.

Distribution:

Indo-West Pacific: Red Sea and east Africa to southern Japan and Lord Howe island. From Indian waters this species was reported from coastal Andhra Pradesh (Barman *et al.*,2004), Andaman and Nicobar Island (Rao, 2003).

2. *Upeneus guttatus* (Day, 1868), Two-tone goatfish

Materials examined:

12 ex, SL: 78-115 mm, Location: Digha Mohana, Date: 01.02.2011, Reg. No. F785.

Table.1: Details of morphometry of the fishes collected during the present study.

Character	<i>Perupeneus heptacanthus</i> (n=2)	<i>Upeneus guttatus</i> (n=12)	<i>Upeneus luzonius</i> (n=7)	<i>Upeneus molucensis</i> (n=6)	<i>Upeneus sundiacus</i> (n=1)	<i>Upeneus taeniopterus</i> (n=8)	<i>Upeneus tragula</i> (n=2)
Standard Length	89-123	78-115	83-135	94-154	139	105-123	95-108
HL in SL	3.23-3.29	3.58-3.96	3.58-3.93	3.24-3.75	3.65	3.10-3.40	3.6-3.95
Body depth in SL	3.15-3.87	4.04-4.33	4.00-4.25	3.5-3.83	3.75	3.60-3.96	3.65-3.72
Eye diam. in HL	3.69-3.75	3.63-3.97	3.51-3.93	4.01-4.71	4.47	3.70-4.15	3.33-3.70
Barbel leng. in HL	1.22	1.27-1.5	1.38-1.48	1.78-1.94	1.68	1.37-1.68	1.71-1.87

Synonyms:

1868. *Upeneoides guttatus* Day, *Proc. Zool Soc., London*, 1867(3) : 938 (Type – locality : Madras).

1875. *Upeneoides bensasi* Day, *Fishes of India*, (1) : 121, pl. 30, fig. 5.

Character:

D: VII+9; A: I,7; P: 14; V: I,5; GR: 23-24; LL: 28-30. Body elongate, depth 4.04-4.33 times in standard length. A pair of chin barbels reaching posterior to the rear border of preopercle, their length 1.27-1.5 times in head length. Proportion of eye diameter to head length is 3.63-3.97 and proportion of head length to standard length is 3.58-3.96. Two dorsal fins widely separated by 4½ vertical scale rows, the first spine longest. Pelvic fins slightly shorter than pectoral fins. Scale present on side of snout. No yellow stripe on body. Red-brown dorsally, silver-white ventrally, red spot present most of the scale (more above lateral line), head silver-pink with red blotches, barbel yellow or white, only upper lobe of caudal fin 4-5 red cross band, lower lobe of caudal fin red with red spot on lower margin (Fig. 2).

Distribution:

Indo-West Pacific: from the Red Sea to South Africa, to northern Australia. From Indian waters this species was recorded as *U. bensasi*

from Andhra Pradesh coast (Barman *et al.*, 2004); Tamilnadu coast (Krishnan *et al.*, 2000) and Gujurat coast (Barman *et al.*, 2000).



Fig. 1: *Parupeneus heptacanthus* (Lacepede, 1802), Cinnabar goatfish.

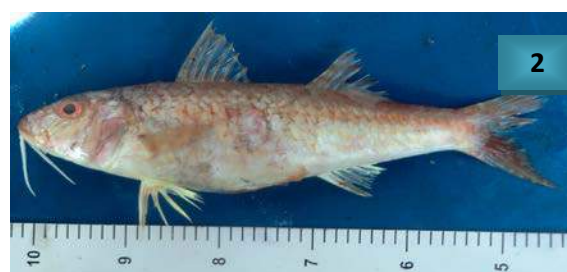


Fig.2: *Upeneus guttatus* (Day, 1868), Two-tone goatfish.

3. Upeneus luzonius Jordan and Seale, 1907, Dark-barred goatfish

Materials examined:

7 ex. SL: 83-135, Location: Digha Mohana, Date: 22.02.2011, Reg. No. F784

Synonyms:

1907. *Upeneus luzonius* Jordan and Seale, *Bull. Bur. Fish., Wash.*, 25, fig.9 (Type-locality: Cavite).

1967. *Upeneus luzonius* Thomas, *J. mar. biol. Ass. India*, 7 (2): 473.

Character:

D: VIII+ I,8 ; A:I,6 ; P:14 ; V:I,5 ; GR: 23-25; LL: 29-30. Body elongate, depth 4.00-4.25 times in standard length. Chin with a pair of barble that extend posterior to rear border of preopercle, their length 1.38-1.48 times in head length. Proportion of eye diameter to head length is 3.51-3.93 and proportion of head length to standard length is 3.58-3.93. Two dorsal fin separated by 4½ vertical rows if scale, the first with 8 spine, first spine is very small. Pelvic fins slightly shorter than pectoral fins. Body brownish red, three saddle like broad dark bars present, first one below 1st dorsal fin, second below second dorsal fin and the third one present on caudal peduncle. Both lobe of caudal fin contains 4 to 6 oblique dark bars, those of lower lobe more prominent (Fig. 3).



Fig.3: *Upeneus luzonius* Jordan and Seale, 1907, Dark-barred goatfish.

Distribution:

Indo- West Pacific: From India to Philippines, Indonesia and Northern Australia. From Indian water this species was recorded from coast of Tamilnadu (Krishnan *et al.*, 2007), Andaman and Nicobar Island (Rao *et al.*, 2000), Andhra Pradesh coast (Barman and Mishra, 2007).

4. *Upeneus moluccensis* (Bleeker, 1855), Goldband goatfish

Materials Examined:

6 ex. SL: 94-154 mm, Location: Digha Mohana, Date: 30.11.2011, Reg. No. F756 .

Synonyms:

1855. *Upeneus moluccensis* Bleeker, *Nat. Tijdschr. Ned-Indie*, 8: 409 (Type-locality: Ambonia).

1868. *Upeneoides fasciolatus* Day, *Proc. Zool. Soc. London*: 151.

Character:

D: VIII+9; A:I,7; P: 15; V: I, 5; GR: 27-29; LL: 33-36; Body elongate, depth 3.5 – 3.83 times in standard length. A pair of white to pink chin barbules not reaching to rear border of preopercle and 1.78-1.94 times in head length. Proportion of eye diameter to head length is 4.01 - 4.71 and proportion of head length to standard length is 3.24 - 3.75. Two dorsal fins widely separated by 5½ vertical rows of scale, the first dorsal spine very small.



Fig.4: *Upeneus moluccensis* (Bleeker, 1855), Goldband goatfis.

No scales on sides of snout. A single bright yellow stripe running through upper part of the eye to caudal peduncle. This yellow stripe is as broad as pupil. Body silvery white, Both dorsal fin with 4 red bars, anal and pelvic fins pale, upper lobe of caudal fin with 6 red or black cross bars, lower lobe with light red colour (Fig.4).

Distribution:

This species is widely distributed from the Red Sea south to Mozambique, east to the western Pacific from southern Japan to northern Australia. The species is also reported from New Caledonia and the Chesterfield Bank (Randall & Kulbicki, 2006). From Indian water this species was recorded from coast of Andhra Pradesh (Barman *et al.*,2004), Chennai (Krishnan *et al.*,

2007), Gujarat (Barman *et al.*, 2000) & Odisha (Barman & Mishra, 2007).

5. *Upeneus sundaicus* (Bleeker, 1855), Ochre – banded goatfish.

Material examined:

1 ex, SL:139 mm, Location:Digha Mohana, Date:08.03.2011, Reg. No. F787

Synonyms:

1855. *Upeneoides sundiicus* Bleeker, *Hist. nat. Poiss.*, 3 : 384, 406 (Type- locality : Mauritius).

1966. *Upeneus sundaicus* Jones and kumaran, *J. mar. Biol. Ass. India*, 7 (1) : 114, fig. 7.

Character:

D: VIII+I,8; A: I,7 ; P: 15 ; V: I,5 ; GR:22 ; LL:32; Body elongate, depth 3.75 times in standard length. Chin with a pair of barbel which extending slightly beyond rear margin of preopercle, their length 1.68 times in head length. Proportion of eye diameter to head length is 4.47 and proportion of head length to standard length is 3.65 First dorsal spine very small. 4½ vertical rows of scale present in inter-dorsal space. Ventral fin almost equal to pectoral fin. Body greenish dorsally , yellowish white ventrally, with a brownish yellow stripe from eye to mid base of caudal fin. Dorsal fin yellowish with pale reddish base. Caudal fin brownish yellow, lower lobe of caudal fin with dusky posterior margin narrow towards the lobe. Barbell orange (Fig.5).



Fig.5: *Upeneus sundaicus* (Bleeker, 1855), Ochre – banded goatfish.



Fig.6: *Upeneus taeniopterus* (Cuvier, 1829) Fins tripe goatfish.



Fig.7: *Upeneus tragula* Richardson, 1846, Freckled goatfish.

Distribution:

Indo- West Pacific: Pakistan, India and Sri Lanka, extending eastward to Indonesia; also from north- western Australia to Japan. From Indian waters this species was reported from coast of Andhra Pradesh (Barman.*et al.*, 2004), Chennai (Krishnan *et al.*, 2007), Gujarat (Barman *et al.*, 2000).

6. *Upeneus taeniopterus* Cuvier, 1829, Finstripe goatfish

Materials examined:

8 ex. SL: 105-123, Location: Digha Mohana, Date: 28.01.2011 , Reg No. F770 .

Synonyms:

1829. *Upeneus taeniopterus* Cuvier, *Hist. Nat. Poiss.*, 3: 384, 406 (Type –locality: Mauritius).

1966. *Upeneus arge* Jones and Kumaran, *J. mar. biol. Ass. India*, 7(1):113, fig.8.

Character:

D: VIII+9 ; A: I,6 ; P: 14; V:I,5 ; GR:24 ; LL:37-38; Body elongate, depth 3.60-3.96 times in standard length. A pair of chin barble just extend to rear margin of preopercle, their length 1.37-1.68 times in head length. Proportion of eye diameter to head length is

3.70-4.15 and proportion of head length to standard length is 3.10-3.40. First dorsal spine very small, 5½ vertical scale rows present in interdorsal space. 12 vertical scale rows of scales along upper part of caudal peduncles. Body silvery orange or pink, two narrow yellow stripes present, first one upper part of the eye to base of upper caudal fin lobe and second at the middle of the pectoral fin base to base of lower caudal fin lobe. Both dorsal fins with three transverse dark bands. Both lobe of caudal fin stripes (Fig.6).

Distribution:

Indo-Pacific: East Africa to the Hawaiian, Line and Tuamotu Islands, north to the Yaeyamas, Ryukyu Islands and throughout Micronesia. From Indian waters this species was reported from coast of In India this fish found in coast of Andhra Pradesh (Barman *et al.*, 2004), Chennai (Krishnan *et al.*, 2007), Odisha (Barman and Mishra, 2007).

7. *Upeneus tragula*, Richardson, 1846, Freckled goatfish.

Material examined:

2 ex , SL: 95-108 mm, Location: Digha Mohana, Date:28.01.2011, Reg. No. F771 .

Synonyms:

1846. *Upeneus Tragula* Richardson, Rep. Br. Ass. Advmt. Sci., 15th meet. 1845: 200 (Type-locality: Canton, India).

1875. *Upeneoides tragula* Day, Fishes of India:121, pl. 30, fig.4.

Character:

D: VIII+I,8 ; A: I,6 ; P: 16 ; V: I,5 ; GR:20-21 ; LL:29; Body elongate, depth 3.65-3.72 times in standard length. Chin with a pair of barbel which not reaching the rear margin of preopercle, their length 1.71-1.87 times in head length. Proportion of eye diameter to head length is 43.33-3.70 and proportion of head length to standard length is 3.6-3.95. First dorsal spine very small. 4½ vertical rows of scale

present in inter-dorsal space. Ventral fin almost equal to pectoral fin. Greenish grey dorsally, densely flecked with brown, white ventrally with many red and brown spots. A brownish black stripe from the front of eye to midbase of caudal fin. Barbel yellow. Both lobes of caudal fin with black transverse black bands. First dorsal fin red with yellow stripes (Fig.7).

Distribution:

Indo- Pacific: East Africa to Vanuata to southern Japan; Palau in Micronesia. From Indian water this species was recorded from coast of Andhra Pradesh (Barman *et al.*, 2004), Chennai (Krishnan *et al.*, 2007), Orissa (Barman *et al.*, 2007), Gujarat (Barman *et al.*, 2000), Andaman and Nicobar Island (Rao, 2003).

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