



**First record of a non-indigenous lanternbelly, *Acropoma argentistigma* (Teleostei: Perciformes: Acropomatidae) from the Bay of Bengal coast of Bangladesh**

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**ABSTRACT**

The Bay of Bengal coast is acting as a pristine ecological niche for many indigenous and non-indigenous fish species as along with other aquatic organisms. The present study describes the first record of lanternbelly, *Acropoma argentistigma* (Okamoto & Ida, 2002) from the Bay of Bengal coast, Bangladesh based on 32 specimens. The species was identified on the basis of phenotypic characteristics; for instance, pinkish red body colour, presence of U-shaped luminous gland, well-organised conical teeth on the lower jaw, 17 gill rakers, and position of anus in the middle of ventral margin. The first record of *Acropoma argentistigma* in the area further enhances the ichthyofaunal diversity in these area as well as overall fish species of Bangladesh.

**INTRODUCTION**

The Bay of Bengal with its adjacent coastal water is an iconic habitat that comprises a huge number of commercially important indigenous and non-indigenous fish species (Nahar *et al.*, 2017; Hanif, 2019; Siddik and Hanif, 2020). The discovery of mystic fishery resources of the Bay of Bengal and its contiguous coastal region is notable in recent years (Hanif *et al.*, 2017; Siddik *et al.*, 2017). The hidden cause of their introduction could be rising water temperatures owing to climate change and/or increasing sampling efforts.

The genus *Acropoma* of the family Acropomatidae was first discovered in 1859 through *Acropoma japonicum* species from Indo-West Pacific region. To date, six species of acropomatid

is identified of which *Acropoma argentistigma* was first reported by **Okamoto and Ida, (2002)**, from Thailand (Andaman Sea). In 2012, it was also reported from Indian coast due to increase distributional range. All species of *Acropoma* genus are previously reported solely from marine environment. *Acropoma argentistigma* is a reef associated marine fish of genus *Acropoma* explicitly found in pelagic zone mainly in continental shelf. The key character of *Acropoma argentistigma* is the presence of luminous organ in the ventral part, consisting a luminous gland, lens, and reflector (**Haneda and Johnson, 1962**).

The purpose of the present ichthyological report is to describe the first occurrence of *Acropoma argentistigma* in the water area of Bangladesh. The information will be helpful in future for better understanding about habitat use of this species and conservation.

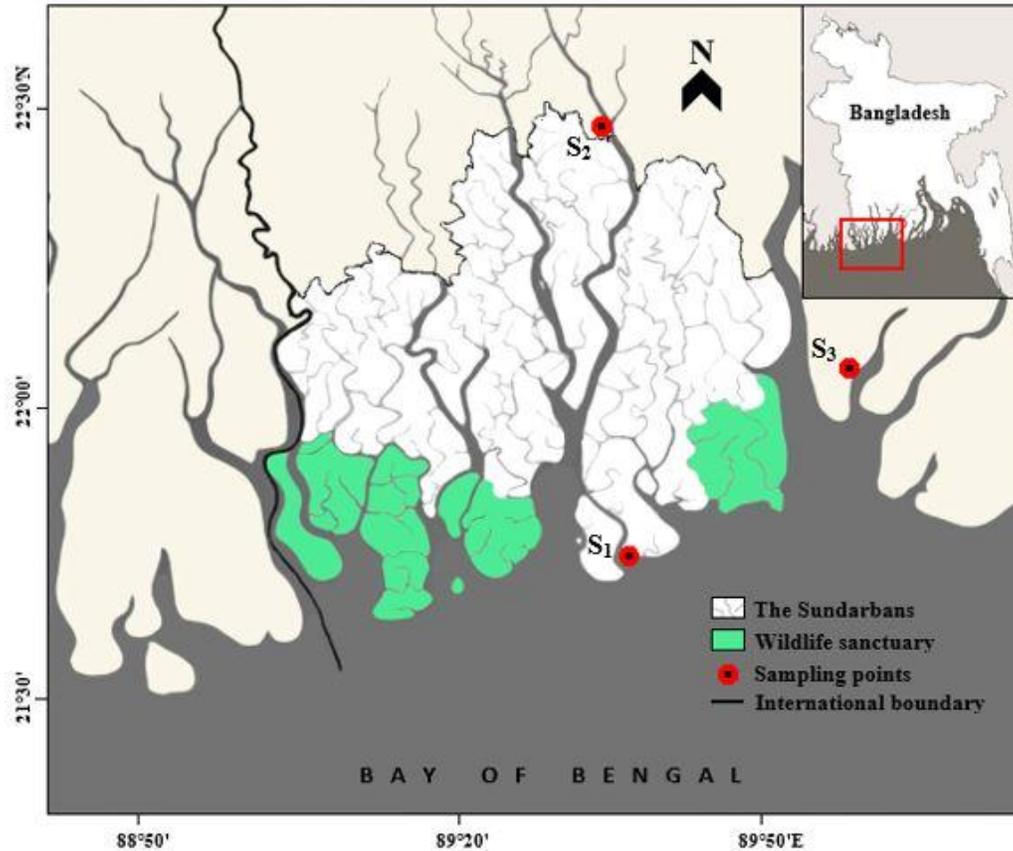
## MATERIALS AND METHODS

Primarily, 11 specimens of Acropomatid fish were collected from a fisherman catch captured from the Bay of Bengal (21°45'36.8"N 89°36'05.4"E) in the Sundarban mangrove habitat (S<sub>1</sub>), by operating set bag net (mesh size of cod-end <0.5 cm) during day time at a depth approximately 24 m, December 11, 2019 (Fig. 1). In 17 2019, 15 more specimens were collected from trash fish landed in Mongla fishery ghat (S<sub>2</sub>) by a marine fish trawler. About a month later, another 8 specimens were collected from mouth of *Pristipomoides filamentosus* (Valenciennes, 1830) during selling fish by a fish monger at Patharghata fish market (S<sub>3</sub>). Collected specimens were preserved in ice box and transported to the laboratory for identification. The specimens were identified as *Acropoma argentistigma* (Fig. 2) based on morphological (morphometric and meristic) characters described by **Nakayama *et al.*, (2016)**. A measuring board was used for morphometric measurement nearest to 0.1 mm and electric precision balance (model: FSH, Korea) for weighing up to 0.1 g. Length measurements unit was converted to mm for easy comparison with previous studies. Morphometric and meristic characters of *Acropoma argentistigma* compared with previous records in Table 1. Subsequently, two fresh specimens from collected samples were preserved in 10% formaldehyde and deposited in the fisheries laboratory of Patuakhali Science and Technology University, Patuakhali, Bangladesh.

## RESULTS

The body of *Acropoma argentistigma* is moderately elongate, dorso-ventrally flattened, partially compressed, head large, upper jaw comparatively long, anus positioned about midway laterally the depressed ventral fin and a U-shaped luminous gland situated round the anus. Large eyes projecting to some extent above upper profile of the head. Two dorsal fins distinct from each other, the last spine (most posterior) of the first dorsal fin lacks any linking with the fin membrane. The upper half of collected specimens were pinkish red whereas opercular flap and lower half of the body were silvery. All fins were reddish colour, muscle of ventral part transparent. A total of 32 specimens of *Acropoma argentistigma* with the length range 78.2-

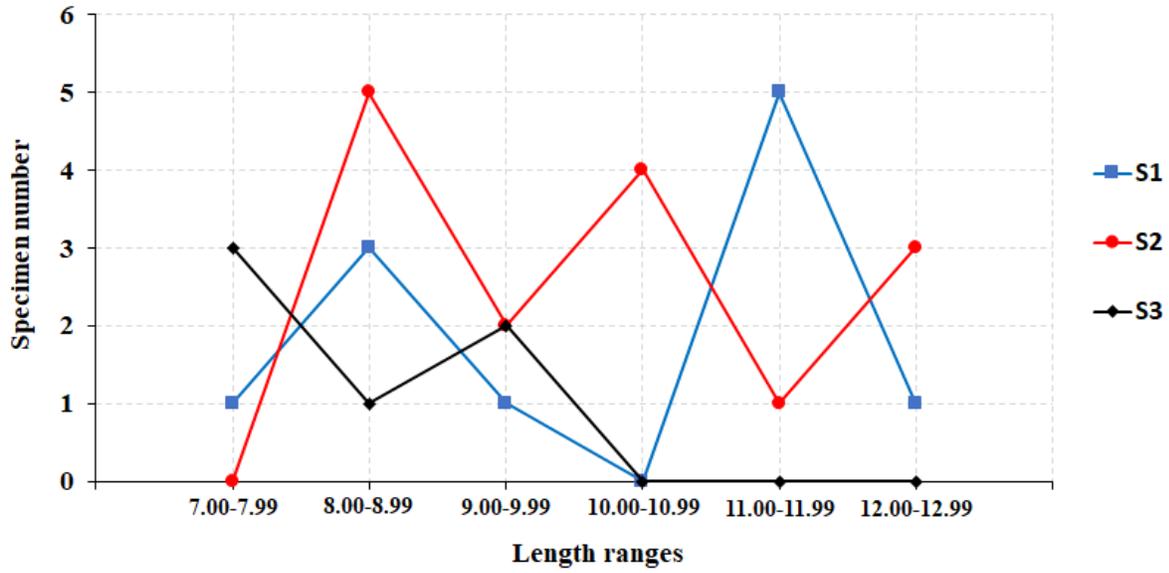
124.4 mm TL and weighing 3.29-7.03 g were collected from the southern coastal area, Bangladesh. Maximum 9 specimens were within the range of 8.00-8.99 while minimum specimens (3) were found in the range of 9.00-9.99 (Fig. 3). On the other hand, specimen <10.6 cm was not found in third sampling site ( $S_3$ ). The maximum length recorded in this study was compared with previously published scientific literature which is represented in the Figure 4.



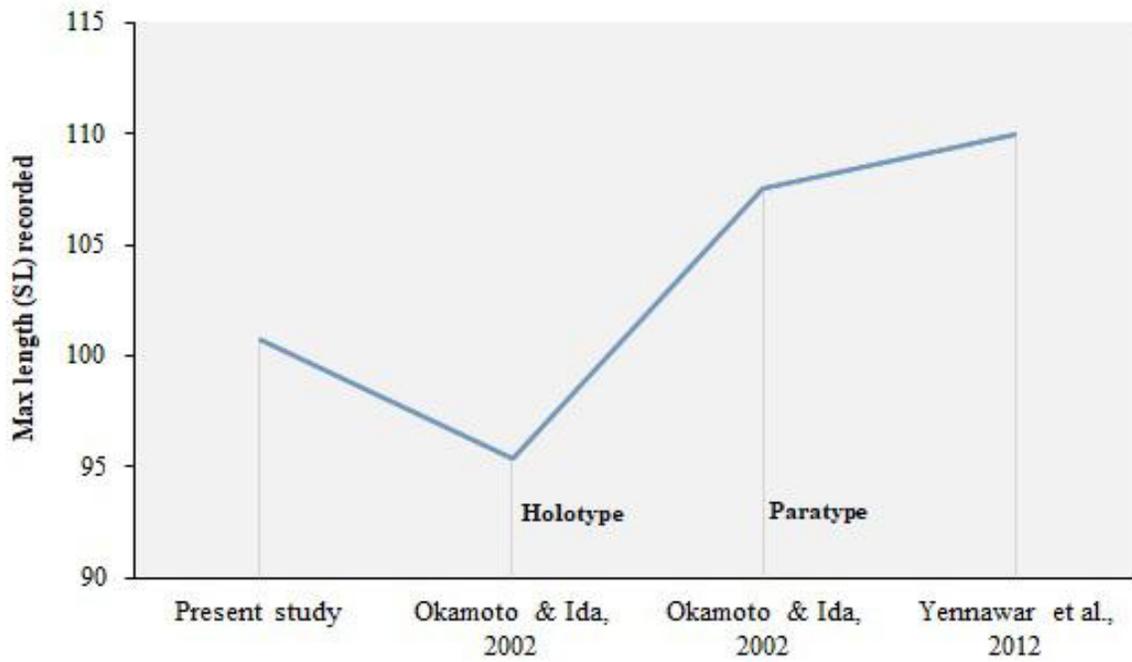
**Fig. 1.** Collection sites (red round shape) of *Acropoma argentistigma*, from the Bay of Bengal coast, Bangladesh



**Fig. 2.** *Acropoma argentistigma* specimen collected from the Bay of Bengal, Bangladesh



**Fig. 3.** Length frequencies of collected specimens *Acropoma argentistigma* during the study period



**Fig. 4.** Maximum size recorded (standard length) for *Acropoma argentistigma* in present study and scientific literature

**Table 1.** Comparison of morphometric and meristic traits of *Acropoma argentistigma* with previous records

Morphometric measurements	Length ranges (mm)		
	This study (n=32)	Okamoto and Ida, 2002 (n=5)	Yennawar <i>et al.</i> , 2012 (n=30)
Total length	78.2-124.4	-	-
Standard length	63.2-100.7	59.0-95.4	44-110
Head length	30.6-39.8	40.0-41.1	39.1-41.3
Body depth	25.9-29.7	27.4-30.4	28.5-32.9
Depth of caudal peduncle	9.8-11.9	10.3-11.7	10.4-12.2
Upper jaw length	16.2-16.7	16.1-16.5	-
Lower jaw length	16.1-17.5	-	-
Eye diameter	9.2-10.5	10.7-11.4	9.4-10.7
First pre-dorsal length	39.0-41.1	38.8-40.7	40.0-41.9
Second pre-dorsal length	43.3-43.3	-	-
Pre-anal length	59.2-68.1	69.2-73.5	-
First dorsal fin base length	15.9-17.0	15.8-17.4	17.1-18.7
Second dorsal fin base length	14.6-16.5	15.0-17.1	13.33-16.3
Anal fin base length	8.1-10.0	10.2-12.2	10.4-12.9
Pectoral fin length	20.4-25.1	21.2-24.0	22.3-25.7
Ventral fin length	13.7-15.9	14.3-16.5	14.8-17.6
<b>Meristic counts</b>			
Dorsal spine	7-8	-	-
Anal spine	3	-	3
Ventral spine	1	-	-
Dorsal fin soft ray	10	10	10
Pectoral fin soft ray	15	15	15
Ventral fin soft ray	5	5	5
Anal fin soft ray	7	7	7
Branchiostegal ray	7	7	7

## DISCUSSION

Authentic species identification is one of the main issues for proper management of non-indigenous species. All morphometric measurements and meristic counts were highly consistent with previous study described by **Yennawar *et al.*, (2012)**. The species differs having meagrely greater head length, 40.0-41.0% SL than congeners *Acropoma lecorneti*, 34% SL (**Okamoto and Ida, 2002**). Reported specimens were a little bit smaller than maximum SL length reported by **Okamoto and Ida, (2002)** and **Yennawar *et al.*, (2012)** which probably related to sampling season, dominance of small size fish, development stage, environmental constrain, availability of food, type of gear used, or fishermen did not reach the adequate place where maximum size of fish were available (**Hanif *et al.*, 2017; Hanif *et al.*, 2018**).

The Patharghata fish market (S<sub>3</sub>) was last but not least sampling site as it bears a meaningful information of this study. Sampled specimens indicate that small size *Acropoma argentistigma* is the preferred food item and the carnivorous habit of *Pristipomoides filamentosus* while species of *Acropoma* genus are predatory in habit and feed on copepods, Caridean shrimp, small fish and also krill (**Park and Huh, 2018**).

Prior to this observation, *Acropoma argentistigma* has had limited documentation in the Andaman sea and Indian water. **Okamoto and Ida, (2002)** recorded 6 specimens with maximum standard length (SL) 108 mm, caught from the Andaman Sea, Thailand. The species also reported from East coast of India with maximum total standard length 110 mm (**Yennawar *et al.*, 2012**). Range expansions of fish throughout the world have been reported as probable indicators of climate change or of oceanographic phenomenon such as sea warming, water circulation and ocean current and anthropogenic interventions (**González-Acosta *et al.*, 2016; Gurlek *et al.*, 2016; Siddik and Hanif, 2020**). Besides this, some biological factors including predation or invasion, feeding, and breeding activity could also be responsible for increasing the distributional range of *Acropoma argentistigma* in this geographical area. The specimen reported herein could have been originated thorough the migration from the neighbouring Indian water area or from the Andaman sea. Therefore, more research is crucial in order to rummage and explore the possible causes for the low occurrence frequency of *Acropoma argentistigma* species. However, further records are of great importance to state if *Acropoma argentistigma* population is definitively established in these geographical areas.

## CONCLUSION

This observation is the first documentation of *Acropoma argentistigma* in the coast of the Bay of Bengal, Bangladesh. A through study of the accessory catch of the coastal and marine water fisheries is emergent as it presents, nowadays, the only opportunity to access such sparse species.

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## REFERENCES

- González-Acosta, A.F.; Miranda-Marín, M.I.; De la Cruz-Torres, J., and Ruiz-Campos, G.** (2016). New records and range extension of three fish species in the Gulf of California. *Mar. Biodivers.*, 48(3): 1625–1629. <https://doi.org/10.1007/s12526-016-0612-0>.
- Gurlek, M.; Erguden, D.; Dogdu, S.A. and Turan, C.** (2016). First record of greenback horse mackerel, *Trachurus declivis* (Jenyns, 1841) in the Mediterranean Sea. *J. Appl. Ichthyol.*, 32: 976–977. <https://doi.org/10.1111/jai.13159>.
- Haneda, Y. and Johnson, F.H.** (1962). The photogenic organs of *Parapriacanthus beryciformes* Franz and other fish with the indirect type of luminescent system. *J. Morph.*, 110: 187–198. <https://doi.org/10.1002/jmor.1051100206>.
- Hanif, M.A.** (2019). First record of blue mackerel, *Scomber australasicus* (Pisces: Scombridae) in the Bay of Bengal, Bangladesh. *Aquat. Res.*, 2(4): 211-215. <https://doi.org/10.3153/AR19020>.
- Hanif, M.A.; Islam, M.A.; Siddik, M.A.B. and Chaklader, M.R.** (2018). Length- weight relationships of three estuarine fish species from Bangladesh. *J. Appl. Ichthyol.*, 34(4): 1065–1067. <https://doi.org/10.1111/jai.13707>.
- Hanif, M.A.; Siddik, M.A.B.; Nahar, A.; Chaklader, M.R. and Fotedar, R.** (2017). A new distribution of the buffon's river garfish, *Zenarchopterus buffonis* (Valenciennes, 1847) in the coastal rivers of Bangladesh. *J. Appl. Ichthyol.*, 33: 1211–1214. <https://doi.org/10.1111/jai.13462>.
- Nahar, A.; Hanif, M.A.; Siddik, M.A.B.; Chaklader, M.R. and Islam, M.A.** (2017). Length–weight and length-length relationships of four endemic fish species caught from Payra River, Southern Bangladesh. *J. Appl. Ichthyol.*, 34(3): 785-787. <https://doi.org/10.1111/jai.13601>.
- Nakayama, N.; Hiramatsu, W.; Kai, Y. and Endo, H.** (2016). First record of the jawfish *Opistognathus trimaculatus* Hiramatsu and Endo 2013 (Actinopterygii: Perciformes: Opistognathidae) from the East China Sea, with comments on its diagnosis. *Mar. Biodivers.*, 48(3): 1621–1624. <https://doi.org/10.1007/s12526-016-0604-0>.
- Okamoto, M. and Ida, H.** (2002). *Acropoma argentistigma*, a new species from the Andaman Sea, off southern Thailand (Perciformes: Acropomatidae). *Ichthyol. Res.*, 49(3): 281–285. <https://doi.org/10.1007/s102280200041>.
- Park, J.M. and Huh, S-H.** (2018). Ontogenetic and seasonal change in the diets of the glowbelly *Acropoma japonicum* Gunther 1859 in the south-eastern waters of Korea. *Indian J. Fish.*, 65(1): 7-14. <https://doi.org/10.21077/ijf.2018.65.167628-02>.

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- Siddik, M.A.B. and Hanif, M.A.** (2020). Is the occurrence of dragonets fish (*Callionymus carebares* and *Callionymus profundus*) in the coastal waters of Bangladesh natural or incidental? Reg. Stud. Mar. Sci., 38: 101361. <https://doi.org/10.1016/j.rsma.2020.101361>.
- Siddik, M.A.B.; Hanif, M.A.; Nahar, A.; Chaklader, M.R. and Kleindienst, R.** (2017). First record of the razorbelly scad *Alepes kleinii* (Bloch, 1793) (Carangidae) along the coast of Bangladesh. Mar. Biodivers. Rec., 10: 32. <https://doi.org/10.1186/s41200-017-0134-x>.
- Yennawar, P.; Ray, D. and Mohapatra, A.** (2012). First record of *Acropoma argentistigma* from Indian waters. Mar. Biodivers. Rec., 5. <https://doi.org/10.1017/S1755267212000449>.