

Short Communication

First record of non-native Bluering angelfish *Pomacanthus annularis* (Perciformes: Pomacanthidae) from the marine water of Odisha coast, Bay of Bengal, India

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Abstract: The bluering angelfish *Pomacanthus annularis* (Bloch, 1787) is a well-known pomacanthid distributed in the Indo-West Pacific from East Africa, throughout Indonesia and New Guinea to New Caledonia, and in the Andaman Sea. For the first time one specimen belonging to this species was caught in the Odisha coast, Bay of Bengal, India. We reviewed its distribution after compilation with available literature.

Keywords: Marine angelfishes, Distribution, Range extension, Tropical coral reefs.

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Introduction

Marine angelfishes (Family: Pomacanthidae) are very common and conspicuous reef fishes with a circum-global distribution in tropical and warm temperature reefs. The family Pomacanthidae contains about 90 species in 8 genera (Fricke et al. 2018) that inhabit in tropical coral reefs around the world. Although, the family is relatively small size, yet it represents one of the most conspicuous group in extant coral reef fish assemblages, with representatives in all tropical seas (Allen et al. 1998; Debelius et al. 2003). Members of this family are well marked for their dazzling color patterns. The most conspicuous feature of the pomacanthids is their strongly developed pre-opercular spine at the corner of the preopercle bone, which is remarkably absent in other teleost families. In addition, almost all the pomacanthids (except in genera *Centropyge* and *Genicanthus*) exhibit the phenomenon of ontogenic dichromatism, which is typically evident in the genera *Pomacanthus*, *Holacanthus* and *Pygoplites*.

The change in the coloration pattern on their body

might be due to infestation with external parasites. Different juvenile coloration may also serve to reduce aggression by adults towards the juveniles (Fricke 1980).

The angelfish of the genus *Pomacanthus* is relatively small with only 13 recognized species. No members of the family Pomacanthidae are native to the Bay of Bengal. However, three non-indigenous angelfish species of the genus *Pomacanthus* have been first recorded from the sea such as *P. imperator*, *P. semicirculatus*, and *P. annularis* from West Bengal in 2011. All these records were based on single individuals and neither species has again been reported from the Bay of Bengal after 2011.

Here, we report the occurrence of the bluering angelfish *P. annularis* which represents the first record of this species of the family Pomacanthidae in the Odisha coast, Bay of Bengal.

Materials and Methods

Fish sampling and Preservation: Fish specimen was caught with gill nets by fishermen in the nearby

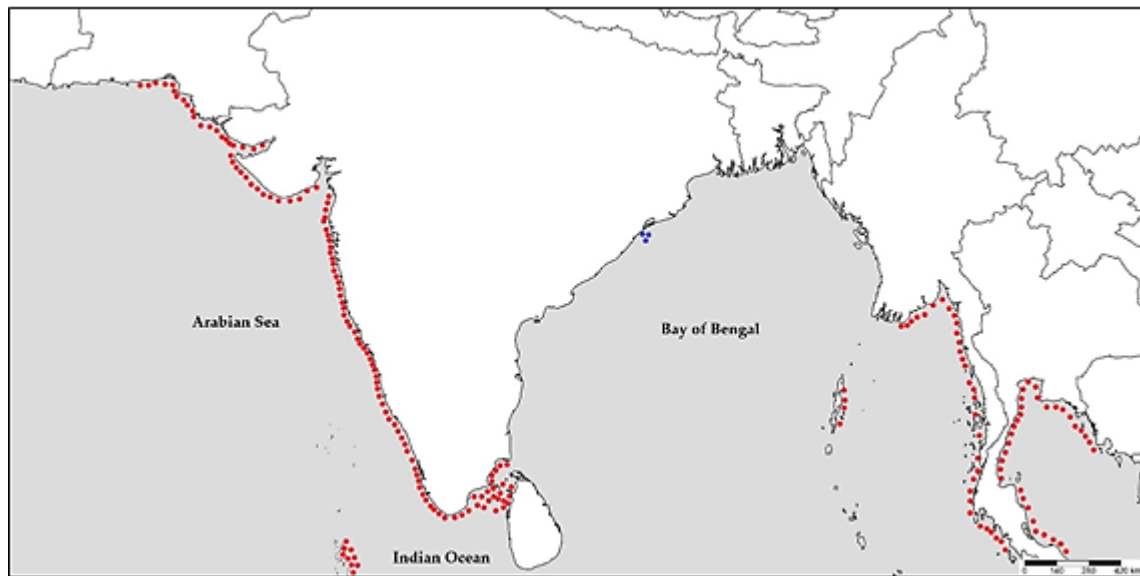


Fig.1. Distribution map of *Pomacanthus annularis*. The spots (Red colour) showing the natural/previous site records of *P. annularis*, while the spots (Blue colour) in Northwest Bay of Bengal show the new site record of this fish.

coastal waters of the Bay of Bengal (19.24°N and 84.90°E), Odisha coast (Fig. 1). The specimen was vouchered and stored in -20°C for future morphological studies. After identification, the specimen was fixed in formalin and preserved in 70% ethanol for long term storage.

Taxonomic identification: The collected specimen was categorized systematically based on the taxonomic characters as outlined in Commercial Sea Fishes of India (Talwar & Kacker 1984) and reconfirmed following the taxonomic keys and species nomenclature as outlined in Eschmeyer (2018), Catalog of Fishes (<http://research.calacademy.org/ichthyology>).

Results

Systematics:

Order Perciformes

Family Pomacanthidae Jordan & Evermann, 1898

Genus *Pomacanthus* Lacepède, 1802

Species *Pomacanthus annularis* (Bloch, 1787)

On 2nd April 2017, one specimen of *P. annularis* was caught on Odisha coast, in the Bay of Bengal, at 20m depth from a sandy and seagrass bottom (Fig. 2). The description of the specimen analysed includes: compressed disc like body; bluntly pointed snout;

small mouth with numerous long teeth; ctenoid scales covering the body and head; a strong spine present at the angle of pre-operculum; greyish-brown coloured body with seven conspicuous brilliant blue curved lines radiating from pectoral fin to soft dorsal fin, the last curved line crossing the caudal peduncle; two blue horizontal lines present on opercle, the upper one crosses the eye and the lower one present below the eye. A blue ring present slightly above the edge of the operculum near lateral line. The principal morphometric and meristic characters of this fish species caught from the Bay of Bengal is presented in Table 1. These data are in agreement with the morphometric and meristic data as reported by previous authors.

Discussion

The morphological measurements and meristic counts of the present fish ascertain its taxonomic identification as *P. annularis*. In the Bay of Bengal, *P. annularis* was first recorded from West Bengal coast in October 2011 and subsequently from Tamil Nadu in January 2014 (Rajeswari & Thangavel 2014). The first appearance of the fish species in Odisha coast, Bay of Bengal was in 2017. It suggests that it has probably managed to establish a population



Fig.2. *Pomacanthus annularis*, voucher Q211-02042017, 312mm TL, 2 April 2017, Odisha coast, Northwest Bay of Bengal, India.

Table 1. Morphometric and meristic parameters of *Pomacanthus annularis* caught in the Odisha coast (North-western Bay of Bengal, India).

Morphometric parameters	Size (mm)	Meristic parameters	Number
Total Length (TL)	312	Dorsal fin Rays	XIII, 24
Standard Length (SL)	261	Pectoral fin Rays	17
	% of SL	Anal fin Rays	III, 22
Fork Length (FL)	100	Caudal fin Rays	16
Pectoral fin length	35.2	Pelvic fin Rays	5
Pelvic fin length	31.4		
Anal fin length	-		
Head length (HL)	29.8		
Pre-dorsal length	42.1		
Pre-anal length	66.2		
Pre-pectoral length	26.8		
Pre-pelvic length	36.7		
Body depth	70.4		
Caudal height	27.2		
Dorsal fin height	34		
Anal fin height	42.9		
Peduncle length	5.7		
	% of HL		
Eye diameter	8		
Snout length	12.8		
Pre-nasal length	35.8		
Inter-orbital width	12.8		

in the Bay of Bengal. In due course, a gradual expansion of species distribution has taken place in the Bay of Bengal. The migration to the Bay of Bengal might be associated with climatic changes. Besides, another clue indicates that it might have

released from aquaria, because the present fish is best known to be an aquarium fish. Or else, it must have paved its way into Odisha coast due to transportation by shipping. The present record of *P. annularis* in northwest Bay of Bengal could be due to larval

dispersal from populations established in Andaman Sea. However, this is not very plausible since the duration of the pelagic larval phase in *Pomacanthus* species ranges between 17-24 days (Thresher & Brothers 1985). Similarly, adult dispersal seems highly unlikely because pomacanthids are branded non-migratory and reef-associated species (Sommer et al. 1996). Pomacanthids are used as ornamental fish in marine aquaria. Since, the aquarium trade is regarded as an important pathway of biological invasion, the present assumption of appearance of the present fish in the Bay of Bengal might have occurred through aquarium release or shipping (Knight 2010).

Since, the present and earlier records of *P. annularis* were based on single specimen and no other individuals of this species have since been recorded from Bay of Bengal, it can be considered as a “casual record”. Very recently the migration of alien species to Odisha coast, Bay of Bengal has included three subtropical and tropical species (Barik et al. 2017a, b). The presence of these alien species in the Odisha coast, Bay of Bengal might be linked to colonization and can serve as an important observatory for these ongoing biogeographic changes.

Conflict of Interest Statement

The authors declare that the research was conducted in the absence of any commercial and financial relationships that could be constructed as a potential conflict of interest.

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یافته علمی کوتاه

اولین گزارش ماهی غیربومی فرشته ماهی حلقه آبی (سوف ماهی شکلان: فرشته ماهیان) از آب‌های دریایی سواحل اودیشا، خلیج بنگال، هند

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چکیده: فرشته ماهی حلقه آبی (*Pomacanthus annularis* (Bloch, 1787) یک فرشته ماهی شناخته شده است که در ناحیه ایندوپاسیفیک از شرقی آفریقا، سرتاسر اندونزی و گینه نو تا کالودینای جدید و دریای اندامن پراکنش دارد. برای اولین بار یک نمونه از این ماهی از سواحل اودیشا، خلیج بنگال هند صید گردید. در این مطالعه، پراکنش این ماهی پس از تلفیق با داده‌های موجود مرور شده است.

کلمات کلیدی: فرشته ماهیان دریایی، پراکنش، افزایش دامنه پراکنش، صخره‌های مرجانی نواحی گرمسیری.