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Short Communication

Taxonomic evidence for the occurrence of rainbow runner and African spadefish along the Odisha coast, India

S R Mohanty*[a,b], R K Behera[a,c], S Acharya[a], J K Seth[b,d], S S Mishra[a], B Behera[e] & Anil Mohapatra[a]

[a]Estuarine Biology Regional Centre, Zoological Survey of India, Gopalpur-on-Sea, Odisha – 761 002, India

[b]Post-Graduate Department of Zoology, Berhampur University, Odisha – 760 007, India

[c]Department of Zoology, Fakir Mohan University, Balasore, Odisha – 756 089, India

[d]Department of Zoology, Siksha Bhavana, Visva-Bharati (A Central University), Santiniketan, West Bengal – 731 236, India

[e]Department of Biosciences and Biotechnology, Fakir Mohan University, Balasore, Odisha – 756 089, India

*[E-mail: mohantyswarup93@gmail.com]

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This study provides taxonomic evidence for two new records along the Odisha coast, India: *Elagatis bipinnulata* (Quoy & Gaimard, 1825) (462 mm TL), obtained from the Arjipalli fish landing centre in Ganjam, and *Tripterodon orbis* Playfair, 1867 (550 mm TL), collected from the Gopalpur (Ganjam) coast. This research contributes to the species diversity within the families Carangidae and Ephippidae in the region, underscoring the ecological significance of these findings.

[**Keywords**: Carangidae, Ephippidae, First report, Species diversity]

Introduction

India is known for its remarkable species diversity[1], which is enhanced by its diverse coastal ecosystems. Among the coastal states of India, Odisha is home to approximately 2,611 marine species, with fishes alone representing the highest diversity of 722 species[2]. This study focuses on two species from the families Carangidae and Ephippidae.

Globally, the Carangidae family comprises around 39 genera and 153 species, while the Ephippidae family includes about eight genera and 15 species[3]. In India, 64 species of Carangidae and approximately six species of Ephippidae have been reported[4,5]. From the Odisha coast, 34 species of Carangidae and three species of Ephippidae have been documented[2,6]. In the family Carangidae, the body shape varies from deep and compressed to elongate and fusiform. The dorsal fin is split into spinous and soft-rayed parts, and the anal fin usually with three spines. Body covered with small cycloid scales and lateral line often with spiny scutes. But in the case of Ephippidae, the body is deep, disc-like, and compressed. Head steep, short, and less than half body depth. Eyes large, mouth small, non-protrusile, with setiform or compressed teeth; no teeth on palatines. Caudal fin is truncate or slightly convex. Scales are smooth or ctenoid; lateral line complete[7].

Within the Carangidae family, the species *Elagatis bipinnulata* is the only representative of the genus *Elagatis*, characterised by clear morphological distinctions[3]. In the Ephippidae family, *Tripterodon orbis* closely resembles *Ephippus orbis*. This study examines both the taxonomic aspects and the distribution of these species in the Indian waters.

Joshi *et al.*[4] stated the occurrence of *Elagatis bipinnulata* along the Odisha coast, however, the report was without any material evidence to support the claim. Additionally, Roul *et al.*[8] noted that juvenile rainbow runners, *E. bipinnulata*, were rarely found in the landings along the Odisha coast during certain years, again without the necessary taxonomic evidence. The distribution records of animal species lacking taxonomic validation can lead to significant ambiguity and confusion. Inaccurate taxonomy undermines research efforts and has profound implications for ecological and conservation sciences[9]. Establishing accurate taxonomic classifications is essential for enhancing clarity and ensuring reliable data in this field. To address the gap in taxonomic ambiguity related to distributional records, this study provides taxonomic evidence for two new records: *Elagatis bipinnulata* (Quoy & Gaimard, 1825) and *Tripterodon orbis* (Playfair, 1867). This research adds one more species to each of the families Carangidae and Ephippidae, contributing to the marine biodiversity of the Odisha coast.

Materials and Methods

During a local survey, a spadefish species was collected from Gopalpur fish landing center (19°15′42.18″ N, 84°54′47.40″ E), and a rainbow runner was collected from Arjipalli fish landing centre (19°18′26.52″ N, 84°57′50.74″ E), Ganjam, Odisha. According to the fishermen, the specimens were

caught by hook and line. Photographs of both the specimens were taken immediately after collection. Morphometric measurements were carried out by using a digital calliper and measuring tape, and meristic counts were taken by using Leica S9i digital stereo microscope. The specimens were fixed with 10 % formalin and then preserved in 70 % alcohol for further use. Taxonomic identification of the collected specimens was done following Heemstra *et al*.[7], and eventually the collected specimens were identified as *Tripterodon orbis* Playfair and *Elagatis bipinnulata* (Quoy & Gaimard). A molecular study could not be conducted because the specimens were fixed in formalin. Later, both the species were deposited at the National Repository of the Estuarine Biological Regional Center, Zoological Survey of India, Gopalpur-on-Sea, Ganjam, Odisha, for further study.

Results

Systematics

Phylum: Chordata
Class: Actinopteri
Order: Carangiformes
Family: Carangidae Rafinesque 1815
Genus: *Elagatis* Bennett, 1840
***Elagatis bipinnulata* (Quoy & Gaimard, 1825)**
Common Name: Rainbow runner (Fig. 1)

Material examined

EBRC/ZSI/F-17666 (1 specimen, 462 mm TL), Arjipalli fish landing centre, Ganjam, Odisha, India, 17th August 2024, collected by: Rajesh Kumar Behera and Swarup Ranjan Mohanty.

Description

D: VI+I, 25+2 rayed finlet; P: 21; A: II, 19+2 rayed finlet. Body elongated, nearly fusiform; head and snout pointed, with a small mouth. Head length 3.8; body depth 4.0; pre-dorsal length 2.7; pre-anal length 1.6; pectoral fin length 6.8; caudal peduncle length 9.3; caudal peduncle depth 18.5, all in SL (Standard Length). Upper jaw ends clearly before the eye; jaws arranged in fine teeth bands, with additional tiny teeth on the roof of the mouth and tongue. Snout length 2.7; eye diameter 4.7; inter-orbital space 2.9; both the jaw length 3.0, all in HL. Lateral line slightly arched above the pectoral fins and straightens posteriorly; no scutes; grooves on the caudal peduncle; base of the soft anal fin noticeably shorter than that of the soft dorsal fin; pectoral and pelvic fins roughly equal in length.

Colour

The body dark olive-green and whitish underneath, featuring two narrow pale blue stripes laterally and a wider olive stripe in between.

Distribution

This species is known to occur worldwide in tropical and warm temperate seas, including the Gulf of Mexico, Caribbean Sea, Red Sea, Persian Gulf, Sea of Japan, and southern Gulf of California, Mexico[10]. The species is also found along the east coast of India: West Bengal[11], Andhra Pradesh[12], Tamil Nadu[13]; and along the west coast of India: Kerala[14,15], Karnataka[16], Maharashtra[17], and Gujarat[18]. Current study reports this species for the first time along the Odisha coast.

Order: Acanthuriformes
Family: Ephippidae Bleeker, 1859
Genus: *Tripterodon* Playfair, 1867
***Tripterodon orbis* Playfair, 1867**
Common Name: African spadefish (Fig. 2)

Material examined

EBRC/ZSI/F12411 (1 specimen, 550 mm TL), Gopalpur fish landing centre, Ganjam, Odisha, India, 09th November 2020, collected by: Swarup Ranjan Mohanty and Rajesh Kumar Behera.

Fig. 1 — *Elagatis bipinnulata* (EBRC/ZSI/F-17666, 462 mm TL) reported from Odisha coast

Fig. 2 — *Tripterodon orbis* (EBRC/ZSI/F12411, 550 mm TL) reported from Odisha coast

Description

D IX, 21; P 18; A III, 16. Body greatly raised and compressed, with a sharply curved upper profile. Body depth 1.6 in standard length (SL). Distinct bulge between the eyes as this profile dips sharply from the start of the dorsal fin to the snout. Pre-dorsal length 2.0; pre-anal length 1.9; pectoral fin length 1.7, Head Length (HL) 3.4, all in SL. Eye diameter 4.4 in HL and positioned high on the head. Thick lips; mouth small, terminal, and slightly protrusible. Snout 5.3; inter-orbital 3.0; upper jaw length 3.6; lower jaw length 3.8, all in HL; moderately wider mouth, and the upper maxillary vertically aligned from the posterior nostril. Dorsal profile of head devoid of scales, and the inter-orbital region is concave and without scales; cheek covered in five rows of scales; scales cover the whole operculum, with the posterior limb of the pre-operculum being naked. Four massive, broad, flat, movable, tricuspid teeth present in the upper jaw and three series in the lower jaw.

Colour

The colour of the body is silvery grey.

Distribution

Tripterodon orbis is distributed in the Red Sea and the Western Indian Ocean, from Eastern Cape and KwaZulu-Natal (South Africa) and East Africa to Madagascar and eastward to Pakistan[10]. The species *T. orbis* is reported from the east coast *i.e*., Andhra Pradesh[19], Tamil Nadu[20,21] and from the west coast *i.e*., Kerala[22] of India, and also found in Andaman and Nicobar Islands[23]. This study records the species for the first time from the Odisha coast.

Discussion

This study reports two species: one from the family Carangidae (*Elagatis bipinnulata*) and the other from the family Ephippidae (*Tripterodon orbis*), based on firm taxonomic evidence. The genus *Elagatis* is a monospecific genus[3] with the species *El. bipinnulata*. This species is found in almost all the coastal states of both the east and west coasts of India. But it was not reported earlier from the Odisha and Goa coasts. The current study bridges the gap between the West Bengal coast and the Andhra Pradesh coast, thereby confirming the species' distribution along the entire eastern coast of India. It is also believed that the species may occur along the Goa coast. So the current study confirms the presence of *El. bipinnulata* all along the Indian waters.

As mentioned earlier, six species from the family Ephippidae have been reported from India, which include *Ephippus orbis* (Bloch, 1787); *Platax batavianus* Cuvier, 1831; *P. orbicularis* (Forsskål, 1775); *P. teira* (Fabricius, 1775): *P. pinnatus* (Linnaeus, 1758)[24]; and *Tripterodon orbis* Playfair, 1867[(ref. 4)]. Among these, *Ep. orbis* closely resembles *T. orbis* morphologically. However, *T. orbis* differs by exhibiting a more oblong body shape, large tricuspid teeth, a larger eye diameter, a scaleless top of the head, and nine faint vertical bars[19]. The body colour of *T. orbis* typically features nine indistinct darker crossbands[19], although these bands tend to fade in adult specimens[24]. The current specimen of *T. orbis* measures 550 mm in length, indicating it might have reached adulthood, at which point the body bands generally disappear.

The documentation of these two species (*El. bipinnulata* and *T. orbis*) will greatly improve our understanding of their zoogeography and diversity. Moreover, this study contributes to the enrichment of marine biodiversity and helps maintain a reliable checklist for the Odisha coast. By deepening the existing knowledge on these species, the ecosystem health can be evaluated more effectively, guide conservation initiatives, and promote sustainable fisheries management, ultimately benefiting both the environment and local communities.

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Conflict of Interest

All authors declares that they have no competing interest.

Ethical Statement

The collected specimens are not classified under the Scheduled category of the Wildlife Protection Act.

Author Contributions

SRM, RKB & SA: Collection, preservation, identification, conceptualization, manuscript design

and writing; JKS, SSM, BB & AM: Identification, manuscript preparation, and critical analysis.

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