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Short Communication

First record of Blackfin stonefish *Pseudosynanceia melanostigma*, Day, 1875 (Synanceiidae: Scorpaeniformes) from India

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The present study documents the first confirmed occurrence of the blackfin stonefish (*Pseudosynanceia melanostigma*, Day, 1875) from the Indian waters, based on the specimens collected from the coastal regions of Gujarat along the west coast of India. This species, belonging to the family Synanceiidae, was identified through detailed morphological analysis. The key diagnostic features observed include a distinctive colour pattern, branchiostegal membranes broadly fused to the isthmus, the specific count of dorsal fin spines, segmented pelvic fin rays, the presence of a large black spot on the anterior part of soft dorsal fins, and two broad dark bars on the caudal fin. Given the limited taxonomic and ecological information available on stone fishes in India, this finding highlights the need for more systematic studies to better understand the distribution, diversity and potential risk associated with venomous marine fishes in the region.

[**Keywords**: Blackfin stonefish, First record, Gujarat, India]

Introduction

The family Synanceiidae primarily comprises marine fishes distributed across the tropical regions of the Pacific and Indian Oceans. Commonly referred to as stonefishes, members of this family possess grey and mottled skin that provides effective camouflage, allowing them to remain indistinguishable from surrounding stones. This cryptic appearance serves both predatory and defensive functions, making them highly adapted to the benthic environments[1,2]. Stonefishes are regarded among the most venomous fishes globally, capable of delivering potent venom through robust dorsal spines[3].

Globally, the family Synanceiidae includes nine genera: Choridactylus, Inimicus, Minous, Synanceia, Trachicephalus, Pseudosynanceia, Leptosynanceia, Dampierosa, and Erosa. Of these, five genera viz. Choridactylus, Inimicus, Minous, Synanceia, and Trachicephalus have been reported from the Indian waters[4-6].

The genus *Pseudosynanceia* Day, 1875 is monotypic comprising a single species, *Pseudosynanceia melanostigma* Day, 1875, commonly referred to as the blackfin stonefish[7]. This species is distributed in the northwestern Indian Ocean, with known occurrences from the Persian Gulf, Gulf of Oman, Pakistan, and Iran[1,7,8]. It is typically associated with coastal ecosystems, particularly mangroves, creek systems, lagoons, and bays along the coast of Pakistan[1].

Pseudosynanceia melanostigma was first described by Day in 1875 from Karachi, Sind (then part of undivided India). Since its original description, the species has been reported from several countries bordering the western Indian Ocean. However, until now, no confirmed record of this species existed from the Indian waters. The present study documents *P. melanostigma* for the first time from India, based on specimens collected from Gujarat, thereby extending the known geographical distribution of the species.

Materials and Methods

Specimens for this study were collected during the systematic surveys conducted by the Zoological Survey of India (ZSI) in different regions of the Gulf of Kutch, Gujarat, India, over different time periods as a part of its in-house research programs. The study analysed three specimens of the blackfin stonefish, *P. melanostigma*: one was collected from Mundra Juna Bandar in September 2023, another from Man Marudi Island in December 2024, and a third from old collections dated July 1972, sourced from the mouth of the Rukmavati River (Fig. 1). The specimens were preserved in laboratory grade spirit and identified to species level using standard references and identification keys[1,7]. Additionally, the collected specimens were compared with the holotype (ZSI F1761) (Fig. 2) available in the National Zoological Collections of ZSI. The identified specimens were registered (Registration No.: ZSI F7340/2, ZSI F16208/2, and ZSI F17141/2) and maintained in the national repository at the Zoological Survey of India.

Results

Family Synanceiidae

Moderately compressed to robust body, head large and with spines, preopercle margin with 3 – 5 spines,

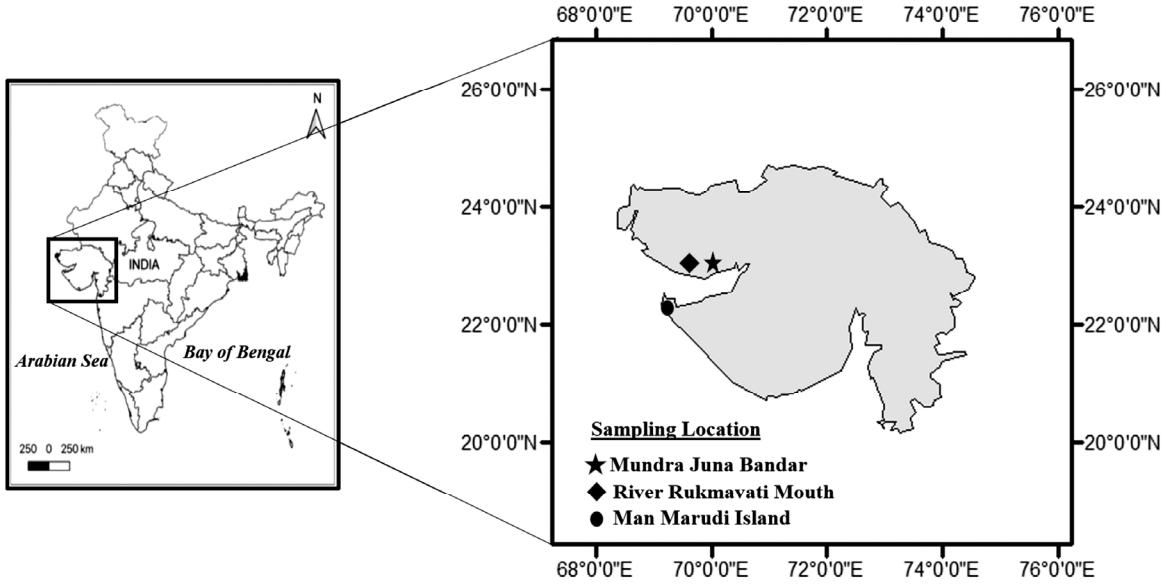

Fig. 1 — Sampling location

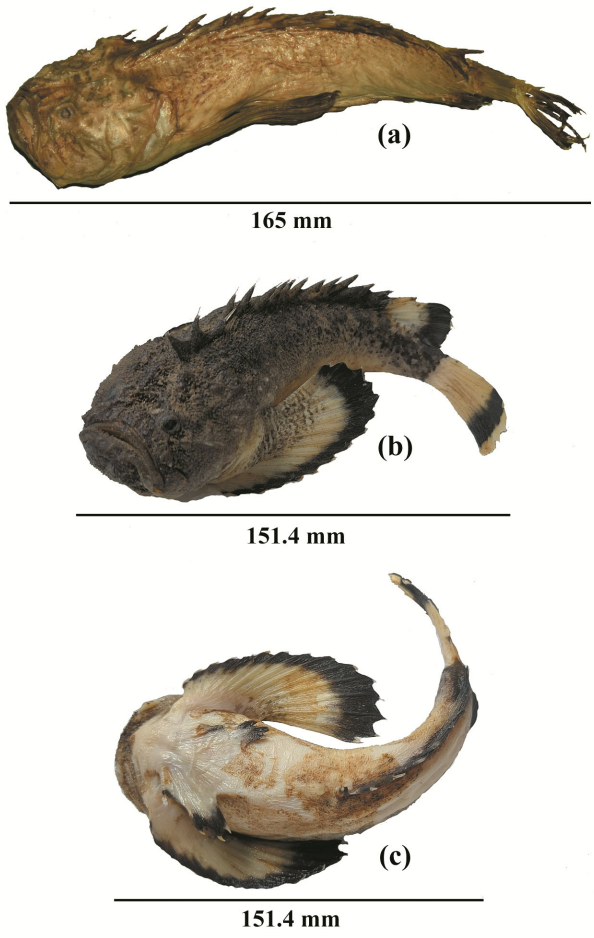

Fig. 2 — *Pseudosynanceia melanostigma*: (a) Holotype, and (b & c) Dorsal and ventral sides of collected specimen

lowermost pectoral fin rays not free from the rest of the fin.

Key to Genera

1) Gill membranes broadly fused to the isthmic region
a) 12 – 15 dorsal fin spines, 4 – 7 segmented rays, 1 pelvic fin spine and 4 – 5 segmented rays ...… (2)
b) 16 – 17 dorsal fin spines, 3 – 5 segmented rays, 1 pelvic fin spine, and 3 rays …. ***Pseudosynanceia***
2a) Anal fin with two spines and 11 – 14 segmented rays ……... ***Trachicephalus***
2b) Anal fin with three spines and 4 – 6 segmented rays ……... ***Synanceia***

***Pseudosynanceia melanostigma* Day, 1875**

Maxilla reaching below the middle of the eye; preopercle bears a moderately strong spine and three short, blunt spines at the lower edge.

Material examined

Three specimens (Total length: 103 – 151.4 mm) of *P. melanostigma* were identified and maintained under the National Zoological Collection (Registration No. ZSI F7340/2, ZSI F16208/2 and ZSI F17141/2).

Diagnosis

Eyes on the upper head surface, directed upwards and slightly outwards; head depressed, its upper surface broader than long; maxilla reaches below mid-eye, posteriorly expanded; preopercle with strong spine at its angle, three short and blunt spines on the lower limb, opercular region with a single spine;

Table 1 — Comparison between holotype & collected specimens of *P. melanostigma*

Morphological characters	Type specimen (Holotype: Reg. No. ZSI F1761)	Collected specimens (Reg. No. ZSI F16208/2 and ZSI F17141/2)
Total length	165 mm	103 – 151.4 mm
Head length	38.11 mm	23.8 – 29.1 mm
Body height	27.4 mm	17.2 – 28.1 mm
Eye diameter	5.45 mm	3.4 mm
Head length: Total length	23.1 %	19.2 – 23.1 %
Body height: Total length	16.6 %	16.6 – 18.5 %
Eye diameter: Head length	14.3 %	11.6 – 14.3 %
No. of dorsal fin spines and rays	16, 5	16, 5
No. of anal fin spines and rays	3, 7	3, 7
No. of pectoral fin rays	14	14
No. of pelvic fin spines and rays	1, 3	1, 3
No. of caudal fin rays	11	11

villiform teeth in transverse vomer band, no palatine teeth; strong dorsal fin spines, end near the gill opening centre; pectoral fins reach anal region, yellow when fresh with wide black borders; caudal fin yellow, black band along its lower half.

Meristics and morphometrics

Total length: 103 – 151.4 mm. Average value of total length: head length 19.2 – 23.1 %, body height 16.6 – 28.1 %. Average value of head length: eye diameter 11.6 – 14.3 %. Number of dorsal spines: 16, dorsal rays: 5, pectoral rays: 14, pelvic spine: 1, anal rays: 3, anal spines: 3, anal rays: 7 and caudal rays: 11. The morphological characteristics of the studied specimens and the holotype were compared and showed nearly identical characteristics (Table 1).

Distribution

Pseudosynanceia melanostigma is found distributed mainly along the Persian Gulf countries[2,9-12].

Discussion

Stonefishes (Family: Synanceiidae) are recognised as the most venomous among marine fishes[12]. In the present study, *Pseudosynanceia melanostigma* was identified from specimens collected from the coastal waters of Gujarat along the west coast of India. Detailed morphological examination and comparison with the holotype specimen confirmed the identity of the species. Notably, this represents the first confirmed record of *P. melanostigma*, commonly known as the blackfin stonefish, from the Indian waters, thereby extending the known distribution range of the species.

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Conflict of Interest Statement

The authors have no conflict of interest.

Author Contributions

SCS: Identification of specimen and measurement of morpho-meristic characters; HUKP: Drafting of manuscript and editing; and SD & RC: Measurement of morpho-meristic characters and drafting of the manuscript.

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