



Short Communication

A new record of right eyed deep-sea flat fish *Poecilopsetta colorata* Gunther, 1880 (Pleuronectiformes: Pleuronectidae) from the Arabian Sea

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Here, the new record of deep-sea flat fish *Poecilopsetta colorata* Gunther, 1880 from Arabian Sea along the Indian coast is reported. The four individual specimens were collected from Sakthikulangara fish landing center (fishing off Kollam 8°56'60.78" N; 76°32'34.27" E) obtained from deep-sea bottom trawlers between 200 and 300 m depth along the southwest coast of India in February 2019 and the voucher specimen is deposited in the Marine Biodiversity Referral Museum at Central Marine Fisheries Research Institute. The genus *Poecilopsetta* Günther, 1880 is reported to have moderate diversity with 15 species inhabiting the deepsea waters. The intraspecies genetic distance in the COI gene of *P. colorata* retrieved from NCBI revealed 0.0 – 1.4 %; while interspecies distance ranged from 1.7 to 9.6 %.

[**Keywords:** Taxonomy, *Poecilopsetta*, COI, Arabian Sea, India]

Introduction

The *Poecilopsetta colorata* Gunther, 1880 belongs to the family Pleuronectidae Rafinesque, 1815 under the order Pleuronectiformes, commonly known as the coloured righteye flounder is a bathy-demersal species reported from the depth range of 200 – 800 m. Genus *Poecilopsetta* comprising about 15 species distributed along the Indo-West Pacific: Bay of Bengal to the South China Sea and Indonesia^{1,2} with seven species occurring in the Indian ocean³. Norman⁴ described the differences between *P. colorata* and *P. praelonga*. Arabian Sea along the southwest coast of India forms the most productive ground for deep-water flat fishes and records the distribution of *Poecilopsetta natalensis* Norman, 1931, *Poecilopsetta inermis* Breder, 1927 along the Indian coast⁵. The Arabian Sea's productivity for deep-water flat fishes is attributed to the presence of upwelling zones driven by monsoonal winds, which

bring nutrient-rich waters to the surface. Moreover, the diverse underwater topography and riverine inputs creates an ideal environment for these species to thrive along the southwest coast of India. Recently, *P. colorata* was also reported from the Mozambique Channel³. Here, the first-time occurrence of *P. colorata* is reported from the southwest coast of India with some taxonomic aspects and new molecular data.

Material and Methods

The specimens were obtained from the bottom trawlers operated with trawl net cod-end mesh size between 20 to 25 mm at 200 and 300 m depth range for approximately 30 – 60 min at a speed of around 3 – 4 knots from the deep-sea fishing harbour (Sakthikulangara - 8°56'60.78" N; 76°32'34.27" E) along the southwest coast of India, during February 2019. The morphological analysis of the specimen was performed using standard conventional methods and identified by the key described by Norman⁶. After regular sampling, specimens were preserved in 95 % ethanol and provided the voucher numbers and deposited at Central Marine Fisheries Research Institute (CMFRI), Cochin, India. Partial sequences of mitochondrial genes (COI) were amplified using universal primers⁷. PCR purified products were sequenced by dideoxy chain termination method⁷ using ABI Prism 3770 automated sequencer from Scigenom, India.

Results

Classification

Family: Pleuronectidae Rafinesque, 1815

Genus: *Poecilopsetta* Gunther, 1880

Poecilopsetta colorata Gunther, 1880 (Fig. 1a, b)

Poecilopsetta colorata, GUNTHER, 1880, Shore Fishes 'Challenger', p. 48, pl. XXII, fig. B; NORMAN, 1927, *Rec Ind Mus*, XXIX, p. 41; WEBER & BEAUFORT, 1929, *Fish Indo-Austral Arch*, V, p. 136.

Poecilopsetta maculosa, ALCOCK, 1894, *J Asiat Soc Bengal*, LXIII (2), p. 130, pl. VII fig. 1; 1895, *Illust Zool Investigator*, Fishes, pl. XV, fig. 1; 1896, *J Asiat Soc Bengal*, LXV (2), p. 328.

Boopsetta maculosa, ALCOCK, 1899, *Cat Indian Deep-Sea Fish*, p. 127.

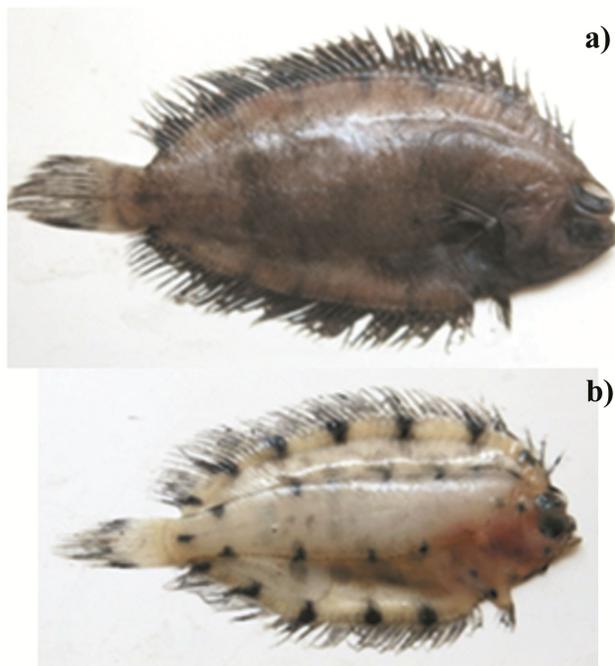


Fig. 1 — *Poecilopsetta colorata* Gunther, 1880, specimen (SL: 118 mm): a) Lateral view of the adult specimen, and b) Lateral view of the juvenile *P. colorata*; collected in Southeastern Arabian Sea, Sakthikulangara fishing port, Kerala coast, India; depth of 200 – 300 m

? *Boopsetta praelonga*, BRAUER, 1906, 'Valdivia' Tiefsee-Fische, p. 295.

Boopsetta praelonga (part), SEWELL, 1912, *Rec Ind Mus*, VII, p. 10 Hab. Gulf of Manar; Andaman Sea; Northwest of Sumatra (?).

? *Boopsetta maculosa*, Weber, 1913, *Siboga-Exped Monogr*, 57, p. 434.

Poecilopsetta colorata, Chen *et al.*, 2016, 9, p. 83, Fig. 2.

Material examined

Southwestern Arabian Sea; Sakthikulangara, Quilon Bank, Kerala, India, 200 – 300 m depth, February 2019, 4 specimens (TL: 143 – 201 mm) including 1 voucher specimen, TL: 143 mm, SL: 118, Body depth: 58 mm, and eye diameter 0.9 mm. Voucher specimen (Accession number: GB.33.7.91), submitted to the Marine Biodiversity Referral Museum at Central Marine Fisheries Research Institute.

Coloration

The adult is uniform silvery with dark fins while the juveniles are spotted with eyes on the right side (Fig. 1).

Distribution

The species is distributed from India to the South China Sea and Indonesia. Depth range 200 – 800 m.

Discussion

In 1899, *Poecilopsetta colorata* was reported from the Andaman Sea as *Boopsetta maculosa* caught from the deep sea trawl landings. The key features (meristic counts) which are considered to be diagnostic in these species are the counts of dorsal and anal fin rays, and lateral line scales^{9,10}. The counts of the observed voucher specimen were 56, 48, and ca. 101-105, which are found to fall into the ranges of the three diagnostic characteristics for *P. colorata* (55-62, 46-53, and 90-124) and *P. praelonga* (57-65, 44-55, and 91-113) as reported by Kawai *et al.*¹⁰. The former species varies with the latter in having a deeper body (body depth 1.9 to 2.6 times in SL vs. body depth 3.8 to 4 times in SL) and a longer upper jaw (upper jaw length 3 to 3.5 times in head length vs. upper jaw length 3.6 to 3.7 with times in head length)¹. The specimen observed in this study was diagnosed with body depth of 2.03 times in SL and upper jaw length 3.4 times in head length which confirms the present specimen as *P. colorata*.

Mitochondrial DNA sequencing

COI (accession number: MK887247, MK887246,) sequences of *P. colorata* were submitted to GenBank. The sequence lengths are 620 to 684 for the two COI accession numbers. The intraspecies divergence between the present specimen and other COI sequences retrieved from NCBI showed lesser ranges (KX611099: 1.4 %); while, interspecies genetic divergence calculated for the present sequence and those of others sequences retrieved from the NCBI for the genus *Poecilopsetta* (*Poecilopsetta plinthus*: JN312207, JN312203; *Poecilopsetta praelonga*: KP267665, *Poecilopsetta hawaiiensis*: DQ521023, *Poecilopsetta natalensis*: JN312201, JN312199) ranged from 1.7 to 9.6 %. The genetic data further confirms that the specimen studied in the present study is more homologous to *P. colorata* sequence (KX611099) of Taiwan and is distinguishable from the co-occurring species in different regions.

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Conflict of Interest

All authors of this manuscript are declaring that no conflict of interest is present in this manuscript.

Ethical Statement

The authors declare that no live fishes were used in this manuscript and its preparation was carried out according to the guidelines of animal ethical procedures of ICAR-Central Marine Fisheries Research Institute (ICAR-CMFRI), Kochi, by carefully considering the welfare of the fishes.

Author Contributions

RDC: Conceptualization, supervision, Investigation, methodology, writing – original draft; GM: Supervision, editing MS; KRR: Data curation and laboratory analysis; LS: Laboratory assistance and laboratory analysis; and NR: Laboratory assistance and data entry.

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