



First report of *Pseudorhombus diplospilus* (Pleuronectiformes: Paralichthyidae) from East Coast of India

Paramasivam Kodeeswaran^{1*}, Jayasimhan Praveenraj²,
Natarajan Jayakumar¹ and Subhrendu S. Mishra³

¹Dr. M.G.R. Fisheries College and Research Institute, Ponneri – 601204, Tamil Nadu, India;

Email: kodyvenkat1995@gmail.com

²ICAR-Central Inland Agricultural Research Institute, Port Blair – 744101,
Andaman and Nicobar Islands; India

³Zoological Survey of India, Marine Fish Section, Kolkata – 700 016, India

Abstract

A large-tooth flounder, *Pseudorhombus diplospilus* Norman (1927) (Pleuronectiformes: Paralichthyidae), is reported from east coast of India based on a single specimen collected from Royapuram fishing harbor, Chennai, Tamil Nadu with detailed meristic and morphometric study. This forms the ninth species in the genus *Pseudorhombus* and the second species in having palmate gill rakers from Indian waters. With this report of *P. diplospilus*, its western limit of distributional range is extended from Indonesia and west Australia to east coast of India.

Keywords: First Record, Palmate Gill Raker, *Pseudorhombus diplospilus*, Range Extension

Introduction

Flatfishes are deep bodied, laterally compressed ray-finned fishes of the order Pleuronectiformes, which comprises 14 families, of which the family Paralichthyidae consists of 14 genera and 109 valid species (Fricke *et al.*, 2018). In Indian waters, 86 species in 32 genera belonging to 8 families of flat fishes have been recorded, of which the family Paralichthyidae is represented by 2 genera and 9 species (Gopi & Mishra, 2014). The genus *Pseudorhombus*, commonly called large-tooth flounders, is represented by 25 valid species in the world, almost restricted to Indo-west Pacific region barring one species in southeast Pacific (Froese & Pauly, 2018). However, only 8 species of this genus are known from coastal waters of India, viz., *Pseudorhombus arsius* (Hamilton, 1822), *P. dupliocellatus* Regan, 1905, *P. elevatus* Ogilby, 1912, *P. javanicus* (Bleeker, 1853), *P. malayanus* Bleeker, 1865, *P. micrognathus* Norman (1927), *P. natalensis* Gilchrist, 1904 and *P. triocellatus* (Bloch & Schneider, 1801) (Talwar & Kacker, 1984; Bijukumar & Deepthi, 2009).

During a visit to Royapuram fishing harbor (13°07'24.49"N; 80°17'52.20"E), located at Chennai, Tamil Nadu, India, a specimen of flounder possessing four eye-spots was encountered. Further examination of the specimen led us to identify it as *Pseudorhombus diplospilus* Norman (1927), which has not been reported from Indian waters before. This species is hereby reported in the present communication after detailed meristic and morphometric study.

Material and Methods

A specimen of four twin-spot flounder (*P. diplospilus*) measuring 133.2 mm SL was collected in Royapuram fishing harbour (13°07'24.49"N; 80°17'52.20"E) from trashes, landed by trawlers operating near Chennai coast, Tamil Nadu, India. The individual was identified according to Norman (1927) and Amaoka & Hensley (2001) and measured with a Mitutoyo CD-6"ASX digital caliper to the nearest millimeter. Counts and measurements follow Hubbs and Lagler (1949) with slight changes. Morphometric measurements (Table

* Author for correspondence

1) were expressed in percentage of Standard Length (SL), except SL in mm. Lateral-line scales and fin rays were counted with the aid of a Nikon stereo-zoom microscope. The specimen was deposited and catalogued in the marine fish collection of the Museum of Dr. M.G.R. Fisheries College and Research Institute, Ponneri, Tamil Nadu, India with catalogue number TNJU-MF-01.

Table 1. Morphometric characters of *Pseudorhombus diplospilus* from Royapuram fishing harbour, Chennai, Tamil Nadu

Characters	Measurements (mm)	% SL
Standard length	133.2	
Body depth	48.1	36.1
Head length	36.3	27.2
Snout length	6.6	5.0
Upper eye diameter	9.8	7.4
Lower eye diameter	8.9	6.7
Interorbital length	11.2	8.4
Upper jaw length on ocular side	14.5	10.8
Upper jaw length on blind side	13.7	10.3
Lower jaw length on ocular side	17.9	13.5
Lower jaw length on blind side	18.6	14.0
Pectoral fin length on ocular side	18.9	14.2
Pelvic fin length on ocular side	11.4	8.6
Pelvic fin length on blind side	11.9	9.0
Depth of caudal peduncle	12.5	9.4
Length of caudal peduncle	12.1	9.1

% SL = relative value [% of standard length]

Results

Order PLEURONECTIFORMES

Family PARALICHTHYIDAE

Pseudorhombus diplospilus Norman, 1927

1927. *Pseudorhombus diplospilus* Norman, *Biological Results Endeavour*, 5(5): 226, Figure 1 (type locality: 3-7 miles northwest of Hervey bay, Queensland, Australia, depth 9-11 fathoms).



Figure 1. *Pseudorhombus diplospilus* Norman, 1927, TNJFU-MF-01, 1 ex., 133.2 mm SL, Royapuram fishing harbour, Chennai, Tamil Nadu coast, India.

Material examined (Figure 1): TNJFU-MF-01, 1 ex., 133.2 mm SL, Royapuram fishing harbour, Chennai, Tamil Nadu coast, India (13°07'24.49"N; 80°17'52.20"E), Kodeeswaran. P., 22.07.2018.

Diagnostic characters: Body elliptical, its depth 2.8 times in SL; upper profile of head notched in front of upper eye; maxilla extends to below posterior border of lower eye; pelvic-fin base of both blind and eyed sides almost equal; the line joining first-dorsal-fin ray and posterior nostril crosses at middle of maxilla. Dorsal-fin rays 79, anal-fin rays 63, pelvic-fin rays 5, pectoral-fin rays 11 on eyed side, caudal-fin rays 18, strong canines anteriorly on both jaws; dentary with 22 teeth, premaxilla with 42, lateral-line scales 84, circum peduncular scales 14. Dorsal and anal fin not connected with caudal fin;

lower jaw with a distinct symphyseal knob. Ctenoid scales on ocular side and cycloid scales on blind side. Gill rakers palmate as long as broad as upper limb with 5 rakers and lower limb with 8 rakers.

Colour in fresh: Overall body colour is brownish. Four double nucleated ocelli located on ocular side, a pair of each above and below lateral line. Each ocellus is a hollow circle with two black spots placed closely to each other and bordered with chrome-yellow colour. All fin rays possess diminished black hollow circles and spots.

Discussion

Norman (1927) documented 8 species of *Pseudorhombus* available in the Indian Museum including *Pseudorhombus annulatus* Norman, (1927) which was described based on specimens from Muscat, Gulf of Oman, but not found along Indian coast. Later, *Pseudorhombus natalensis* Gilchirst (1904) was reported from the south-west coast of India (Kapoor *et al.*, 2002, Bijukumar & Raghavan, 2015). Although an unpublished PhD thesis recorded *P. diplospilus* from Kerala coast, the present report forms the first documented occurrence of *P. diplospilus* in Indian waters, particularly from east coast of India and becomes the ninth species of *Pseudorhombus* now known from Indian coastal water.

Pseudorhombus diplospilus closely resembles *P. duplicioccellatus* known from this region in having palmate gill rakers, but differs in having higher lateral-line-scale counts (83-98 vs 73-84 in *P.*

duplicioccellatus), slender body (depth 2.3-2.7 in SL vs 2.2-2.4), presence of strong canine teeth in both jaws (no strong canine teeth in *P. duplicioccellatus*) and longer maxilla (Norman, 1927; Amaoka & Hensley, 2001). The other species with palmate gill rakers found in the Indo-Pacific is *Pseudorhombus spinosus* McCulloch (1914), which can be distinguished from *P. diplospilus* in having gently curved head profile without a notch in front of eye and the line joining first dorsal fin ray and posterior nostril passes behind the maxilla (Amaoka & Hensley, 2001).

Pseudorhombus diplospilus is distributed in South China Sea in north to Queensland in east and north-west coast of Australia (Amaoka & Hensley, 2001). Although this species has been listed (Fischer & Whitehead, 1974) from Fishing Area 57 & 71, there is no material evidence of its occurrence even from Andaman and Nicobar Islands (Rajan *et al.*, 2013). The present report from Chennai coast expands the distributional range of *Pseudorhombus diplospilus* from Indonesia and Australia to the east coast of India.

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