"First Recorded Occurrence and Morphological Study of *Paraplagusia bilineata* in the Arabian Sea, Gujarat, Northwest Coast of India"

Comment [WU1]: Report on the First Recorded Paraplagusiabilineata in the Arabian Sea, Gujarat, Northwest Coast of India

ABSTRACT

The present study reports an additional record of the rare flatfish, *Paraplagusia bilineata* (Cyanoglossidae), off Dholai fishing harbour, Gujarat, India. One specimen was caught in a trawl net at a depth of 30–32 m around the coast of Gujarat. The total length and weight of the specimen were recorded as 20.4 cm and 60.5 g, respectively. In total, 18 morphometric parameters were closely observed and recorded for the taxonomic identification and confirmation of the species. Previously, *P. bilineata*was not reported inGujarat. This study serves as the initial report of the presence of *Paraplagusia bilineata* from Dholai fishing harbour, Gujarat, on the Northwest coast of India.

Comment [WU2]: It is preferable to rewrite the abstract."

Keywords: Cyanoglossidae, Dholai fishing harbour, Paraplagusia bilineata, Trawl net

INTRODUCTION:

Flatfishes, belonging to the order Pleuronectiformes, are characterized by their deep, laterally compressed bodies. Within this order, the family Cyanoglossidae includes species commonly known as tonguesoles. These fishes are noted for their distinctive tongue-like shape, featuring a high degree of compression and tapering towards the caudal fin.

In Indian waters, 67 species in 28 genera belonging to 6 families of flatfishes of order Pleuronectiformes have been recorded, of which the family Cyanoglossidae is represented by 16 species that belong to 2 genera namely *Cyanoglossus* and *Paraplagusia* (Froese & Pauly, 2024).

The genus *Paraplagusia,* commonly called large-tooth flounders, is represented by 11 valid species globally, (Froese & Pauly, 2024). However, only 2 species of this genus are known from the coastal waters of India.

The species in this study is categorized under the IUCN category of 'Least Concern'. This demersal, marine species inhabits soft substrates of estuaries and shallow coastal areas. Its diet consists of diverse benthic invertebrates, including crustaceans, such as penaeids and amphipods. This species is also frequently part of the bycatch of demersal trawl fisheries, which is sometimes discarded at sea and processed for fishmeal (Munroe, 2021). It attains a maximum size of 35 cm total length but is more common to 15-25 cm (Fischer W., 1984).The objective of this study was to identify and give detailed taxonomic and morphological descriptions of *Paraplagusiabilineata*.

MATERIALS AND METHODS:

The specimen analyzed in this study was obtained from a trawler boat operating out of the Dholai fishing harbour (Figure 1). During a survey targeting rare fish species in Gujarat, this specimen was collected and transported to the College of Fisheries Science in Navsari for detailed examination. Morphometric parameters were recorded, the study utilized specialised taxonomic trays, Vernier callipers, and various measuring scales. FAO species identification sheets (Fishcher W., 1984), The fauna of India (Day, 1878), and Commercial Seafishes of India (Kacker& Talwar, 1984) were used for the identification of the species. Before its deposition in the Aquatic biodiversity museum at the college, the specimen was photographed and preserved in 10% formalin (Accession No: A 16.1.2.1).

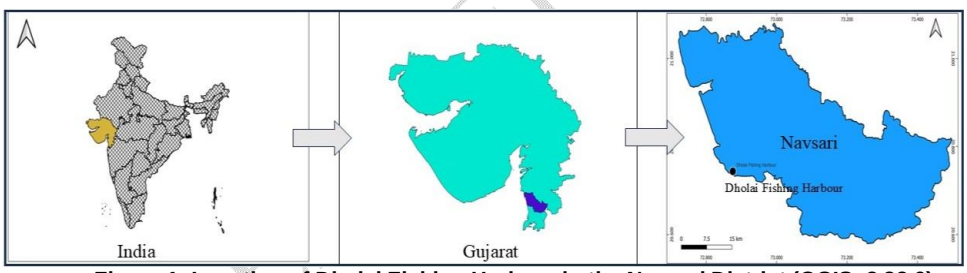

Figure 1: Location of Dholai Fishing Harbour in the Navsari District (QGIS, 3.32.0)

The classification***of Paraplagusiabilineata*(Bloch, 1787)**
Kingdom: Animalia
Phylum: Chordata
Subphylum: Vertebrata
Infraphylum: Gnathostomata
Parvphylum: Osteichthyes
Gigaclass: Actinopterygii
Superclass: Actinopteri
Class: Teleostei
Order: Pleuronectiformes
Family: Cynoglossidae
Subfamily: Cynoglossinae
Genus*: Paraplagusia*
Species*: Paraplagusiabilineata*
(Source: WoRMs, 2024)

Comment [WU3]: The referencementions

Comment [WU4]: It is preferable to rewrite

Comment [WU5]: The classification has been moved here, and arranged in this way.

RESULTSAND DISCUSSION:

Material Examined: A 16.1.2.1, TL: 20.4 cm weight 60.5 g. Dholai fishing harbour, Southwest coast of Gujarat, India (21.7081° N latitude and 72.9007° E) Capture Date: (18thJanuary 2024). In the present study total of 18 morphometric parameters were recorded as per the FAO standard (Table 1).

Sr. No	Parameter	cm	% TL	% SL
1	Total length (TL)	20.4	100.00	111.48
2	Standard length (SL)	18.3	89.71	100.00
3	Pre-anal length	4.5	22.06	24.59
4	Pre-pelvic length	4.0	19.61	21.86
5	Body depth	5.1	25.00	27.87
6	Head length	4.3	21.08	23.50
7	Head height	4.6	22.55	25.14
8	Eye diameter (upper)	0.3	1.47	1.64
9	Eye diameter (lower)	0.3	1.47	1.64
10	Inter orbital length	0.2	0.98	1.09
11	Pre-orbital length	1.9	9.31	10.38
12	Post-orbital length	2.2	10.78	12.02
13	Angle of mouth to gill opening	1.8	8.82	9.84
14	Angle of mouth to snout tip	2.4	11.76	13.11
15	Upper jaw length on ocular side	0.8	3.92	4.37
16	Upper jaw length on blind side	0.8	3.92	4.37
17	Lower jaw length on ocular side	1.3	6.37	7.10
18	Lower jaw length on blind side	1.3	6.37	7.10

Table 1: Morphometric parameters of *Paraplagusiabilineata*

Comment [WU6]: Move the title to the top

Species description: These are tongue-shaped flatfishes with sinistral eyes. Both eyes on the left side of the body with scales present in the interorbital space (Figure 2a). Lips on the ocular side of the body with fringed tentacles in two rows(Figure 2b). Snout strongly hooked overhanging the mouth opening, the tip almost reaching the border of the lower eye. Rostral hook long and reaching beyond lower eye. Mouth inferior,teeth minute and on the blind side only. A very well-developed tubular nostril present on the blind side of the body. Dorsal fin originates on the head, before the eyes, no spines or spiny rays present in dorsal or anal fins. Two lateral lines present on the ocular side of the body, both lateral lines originating at the snout tip, and extending all the towards caudal fin. Dorsal and anal fins confluent with caudal fin; dorsal fins with 105-106 soft rays and anal fin with 78-79 soft rays. Only left side pelvic fin present (Figure 2c). Anus opening present between pelvic and anal fins. Small ctenoid scales present on the both sides of body. 110-111 scales present on the middle lateral line; 15-16 scales present between upper and middle lateral lines.

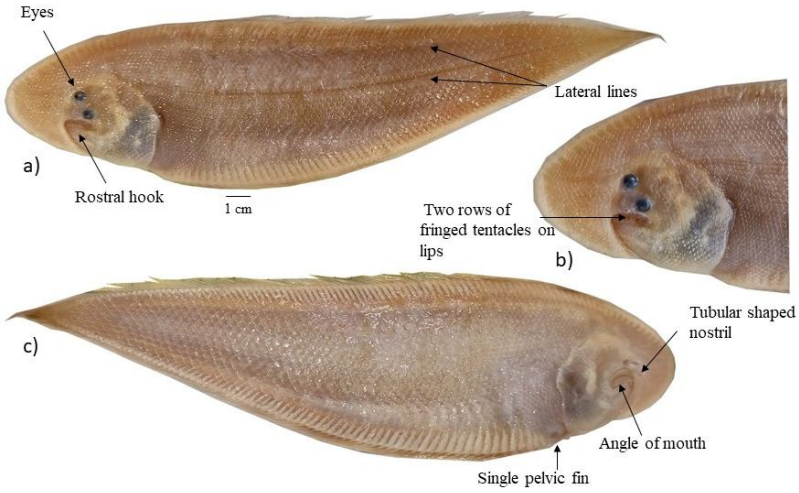

Figure 2: a) Ocular side (left side) lateral view b) Ocular side head view c) Blindside (right side)lateral view

Colouration: When fresh, the ocular side of the body appears brown, while the blind side has a slightly yellowish hue.

The morphometric data collected in the present study align closely with FishBase (Froese & Pauly, 2024), with all parameters nearly matching those reported in previous studies (Figure 3). By analyzing and comparing these characteristics with established identification keys, we have confirmed that the fish in present study is indeed *Paraplagusia bilineata*. This consistency not only validates our findings but also reinforces the reliability of the identification keys used for this species

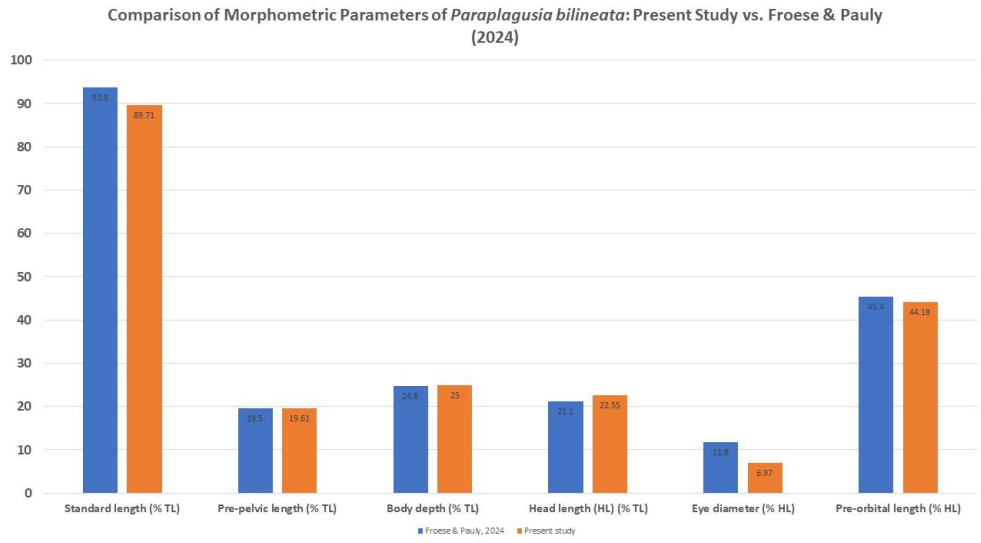

Figure 3: Comparison of various morphometric parameters against total length (TL)

Comment [WU7]: The comparison is not clear, and it is better to compare it with other sources because it describes the existence of this type of fish

CONCLUSION:

Numerous studies have been conducted by researchers on the ichthyofaunal diversity along the northwest coast of Gujarat. These include studies by Solanki et al. (2020) at Okha Port, near the mouth of the Gulf of Kachchh; Katira and Kardani (2017), Brahmane et al. (2014), and Parmar et al. (2022) in the southern Gulf of Kachchh (GoK); Sidat et al. (2021) along the Mandvi coast (northern GoK); and Singh et al. (2021) in Sutrapada. Additionally, investigations by Joshi et al. (2015) and Sikotariya et al. (2018) focused on the Veraval coast, but none of these studies documented this species or any member of the genus *Paraplagusia*. On the southwest coast of Gujarat, biodiversity assessments are relatively scarce. Among the limited studies, Borichangar et al. (2022) conducted research at the Dholai fishing harbour, which also lacks records of this species or any other species of the genus *Paraplagusia*. This study is the first to report the presence of the genus *Paraplagusia* and *Paraplagusiabilineata* along with detailed morphological descriptions from Gujarat, the northwest coast of India.

Comment [WU8]: It is better to rephrase conclusions without citing sources.

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