



First Record of Grey Bamboo Shark, *Chiloscyllium griseum* (Müller & Henle 1838) from Dholai Port, Southwest Coast of Gujarat, India

R.V. Borichangar, J.N. Parmar, U.D. Vyas*, L.V. Tandel¹, M.R. Patel², R.B. Vala³
and P.P. Patel⁴

¹Department of Fisheries Resource Management, ²Department of Aquatic Animal Health Management

³Department of Fisheries Engineering and Technology, ⁴Department of Fish Processing Technology,
College of Fisheries Science, Kamdhenu University, Navsari-396 450, India

*E-mail: upsvyas55@gmail.com

Abstract: This study focused on *Chiloscyllium griseum*, also known as the Grey bamboo shark, which inhabits the Indian coastal waters. The main objective of this study was to identify and describe the Grey bamboo shark species in the region and assess its conservation status. A female specimen was collected from a trawler operating near the southwest coast of Gujarat. Detailed morphometric parameters were meticulously observed and recorded for taxonomic identification. Subsequently, the specimen was transferred to the College of Fisheries Science, Navsari for further analysis and preservation. The results reveal that *C. griseum* was first time documented at Dholai port and along the Arabian Sea coast of south Gujarat. This paper provides comprehensive details about the morphometric parameters observed of adult specimens of *C. griseum*. This research significantly contributes to the understanding of the Grey bamboo shark in Gujarat, shedding light on its distribution and providing a comprehensive description of its morphological traits.

Keywords: Bottom Trawler, Dholai Port, Gujarat coast

The Indian coastal waters contain total of 88 shark species, encompassing 6 orders, 21 families, and 44 genera (Kizhakudan et al 2015). According to global data, quarter of sharks and ray species are currently facing the risk of extinction. This is primarily caused by unsustainable fishing practices, significant incidental catches, the destruction of their habitats, and the presence of illegal, unreported, and unregulated (IUU) activities (Clarke et al 2006 and Camhi et al 2009). The Indo-Pacific shark family Hemiscyllidae contains the genera *Hemiscyllium* and *Chiloscyllium* (Whitley 1967 and Compagno 1973). The Grey bamboo shark, *Chiloscyllium griseum* is commonly encountered in the Indo-West Pacific region, specifically in rocky regions and lagoons. It inhabits depths between 5 to 80 meters. Its distribution spans across several countries including Pakistan, India, Sri Lanka, Malaysia, and Thailand. Additionally, this species can be found in Indonesia, China, Japan, the Philippines, and Papua New Guinea. (Compagno 2001). The bamboo shark, known as *Chiloscyllium griseum*, is a type of shark that resides near the ocean floor and is characterized by its slow and lethargic movements. Its preferred habitat is in the waters of the Indian region, and during the period of December to May is commonly caught as bycatch. Due to limited research conducted on this species in Gujarat, there is a lack of available literature pertaining to *Chiloscyllium griseum*.

Dholai Port, located in the Navsari district of Gujarat, serves as a significant landing centre in south Gujarat coast

of Arabian Sea. The majority of the boats registered at the port are mechanized trawlers, while a portion of the fleet consists of small vessels that utilize gill nets. The port facility is spread over 23 hectares of land and includes auction halls, net mending sheds, and a non-operational diesel pump. There is no evidence of this species being found in Gujarat, but based on the current study, it has been documented that *C. griseum* is found along the south Gujarat Coast.

MATERIAL AND METHODS

On February 10, 2023 a trawler boat operating near the southwest coast of Gujarat landed a female specimen of Grey bamboo shark at Dholai port (Fig. 1). Total 109 morphometric parameters were closely observed and recorded for taxonomic identification and confirmation of *C. griseum*. The taxonomic identification was verified using reputable resources such as the FAO species catalogue, Vol 4, Part 1 Sharks of the world, an annotated and illustrated catalogue of shark species known to date by Compagno (2001).

The fishermen provided information about the fishing location, operating depth, and the gear used to catch *C. griseum*. Photographs of various important characteristics of the specimen were captured for documentation and future publication, confirming its identification. The specimen was preserved in a 5% formalin solution and display in the museum of the College of Fisheries Science, Kamdhenu University, Navsari.

Conservation status: The conservation status of *C. griseum* was determined using information from the IUCN red list and fish base websites. According to the IUCN, this species was categorized as Vulnerable in 2020, with a global scope of assessment (IUCN 2020).

RESULTS AND DISCUSSION

During the present study, *C. griseum* was first reported from Dholai port and the Arabian Sea coast of the south Gujarat region. According to the information obtained from the fishermen, it came to light that the specimens were caught from a bottom trawler operating at a depth of 30-32 meters near the south Gujarat coast of Arabian Sea. The total of 109 morphometric parameters were observed as standardized procedure of FAO for taxonomic identification of sharks (Table 1).

Species description: The mouth of the species is situated

significantly ahead of the eyes, and the dorsal fins are devoid of spines and positioned towards the rear end of the tail, which is marked by a thick and notably elongated structure located before the caudal fin. The anal fin is also long and positioned anterior to the caudal fin, while the trunk lacks lateral ridges. The dorsal fins are characterized by straight or outwardly curved posterior margins, with the first dorsal fins origin positioned roughly opposite the rear halves of the pelvic fin bases. The adult specimens of the species do not generally display any distinct patterns of coloration, whereas juvenile specimens exhibit transverse dark bands without any black borders.

The pre-pectoral length is 18.63% of the total length. The snout is rounded at the front. The eyes are moderately large, measuring 1.66% of the total length (Fig. 5). There are no lateral ridges on the sides of the trunk, and the ridges between the dorsal fins are not prominent (8.12% TL). The

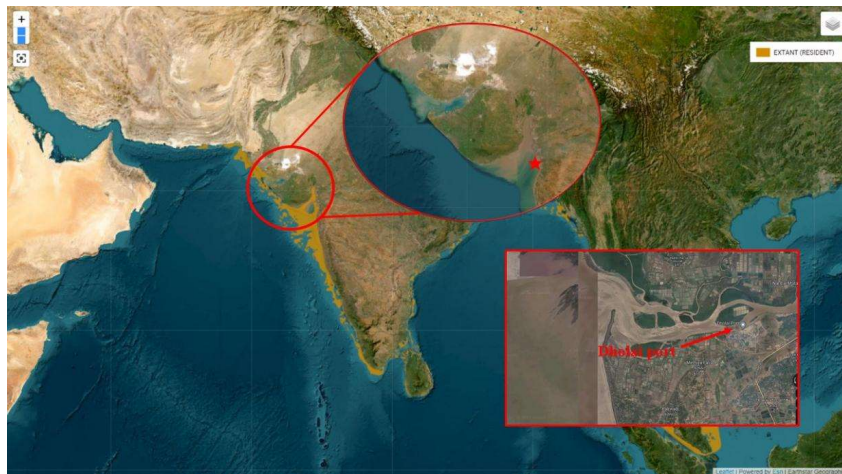


Fig. 1. Location of sample collection along with the species occurrence on the Arabian sea coast

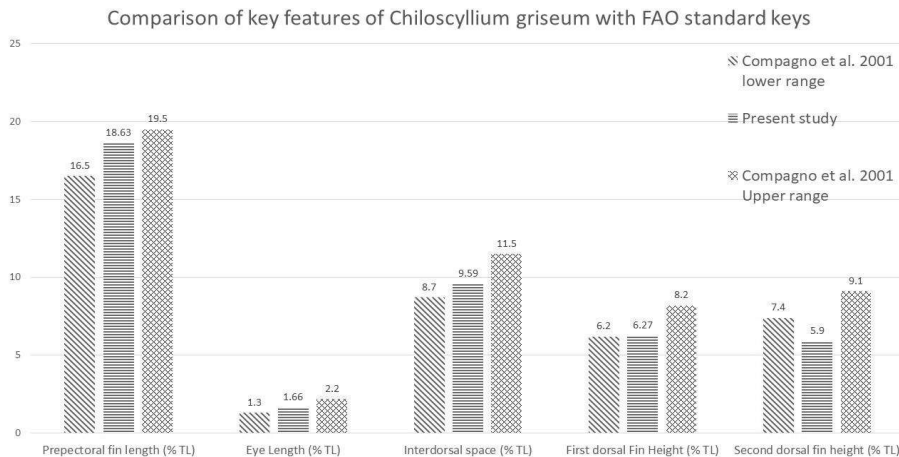


Fig. 2. Comparison of key features of *Chilioscyllium griseum* with FAO standard key

Plates

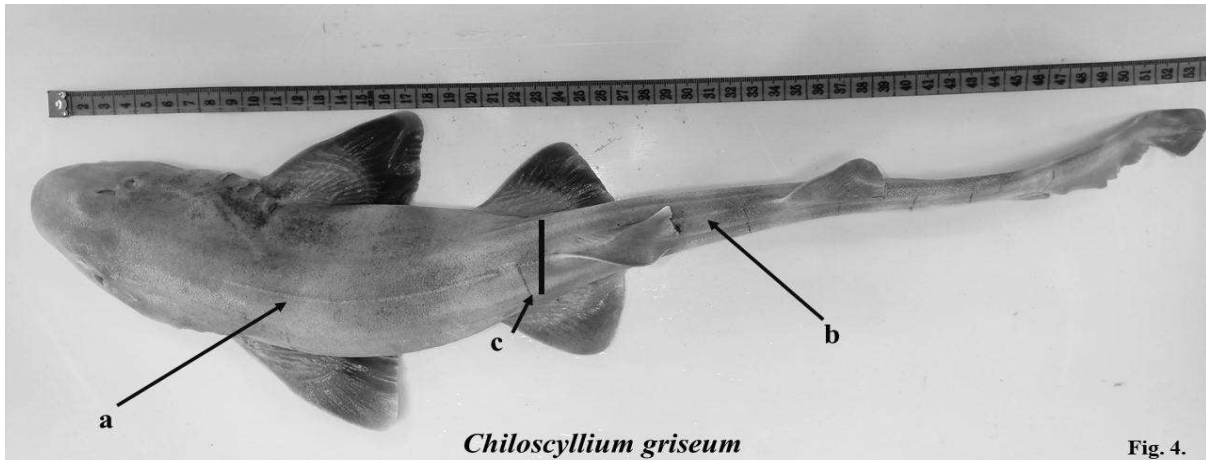


Fig. 4.

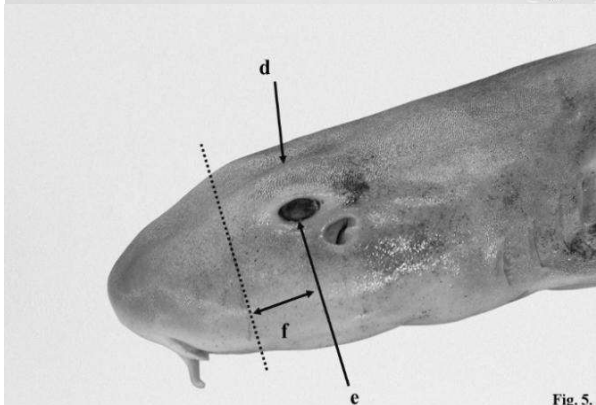


Fig. 5.

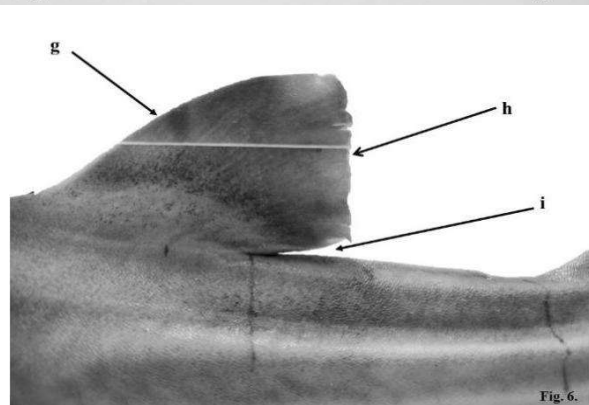


Fig. 6.

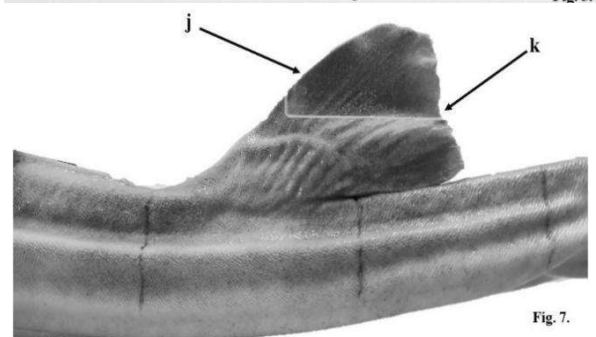


Fig. 7.

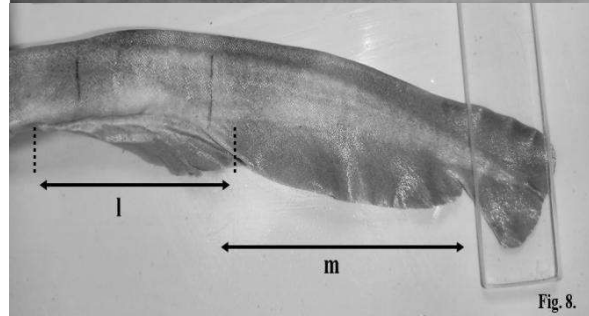


Fig. 8.

- **Fig. 4.**
 - a: Pre-dorsal ridge
 - b: Inter-orbital ridge
 - c: Origin of first dorsal fin on rear half of pelvic fin
- **Fig. 5.**
 - d: Supra-orbital ridge
 - e: Large eyes
 - f: Mouth well in front of eyes
- **Fig. 6.**
 - g: First dorsal fin well rounded and spineless
 - h: Posterior margins of dorsal fins straight rather than concave
 - i: Both dorsal fins projects free rear tips
- **Fig. 7.**
 - j: Second dorsal fin anteriorly rounded without any spines
 - k: Straight posterior margin
- **Fig. 8.**
 - l: Anal fin length (origin to free rear tip) smaller than hypural caudal lobe
 - m: Hypural caudal lobe

Table 1. Morphometric parameters of *Chiloscyllium griseum*

Morphometric parameters	TL* (%)	Cm
Total length	100	54.20
Fork length	-	-
Pre-caudal fin length	76.75	41.60
Pre-second dorsal fin length	58.49	31.70
Pre-first dorsal fin length	40.77	22.10
Head length	16.79	9.10
Pre-brachial length	16.05	8.70
Pre-spiracular length	8.12	4.40
Pre-orbital length	6.64	3.60
Pre-pectoral fin length	18.63	10.10
Pre-pelvic fin length	35.98	19.50
Snout vent length	43.36	23.50
Pre-anal fin length	71.22	38.60
Inter dorsal length	9.59	5.20
Dorsal caudal fin space	9.96	5.40
Pectoral pelvic space	13.65	7.40
Pelvic fin anal fin space	35.42	19.20
Anal fin caudal fin space	0.00	-
Pelvic fin caudal fin space	31.92	17.30
Vent caudal fin length	59.23	32.10
Prenarial length	2.77	1.50
Pre-oral length	4.43	2.40
Eye length	1.66	0.90
Eye height	0.74	0.40
Intergill length	6.64	3.60
1 st gill slit height	2.21	1.20
2 nd gill slit height	2.21	1.20
3 rd gill slit height	2.58	1.40
4 th gill slit height	2.03	1.10
5 th gill slit height	2.03	1.10
6 th gill slit height	-	-
7 th gill slit height	-	-
Pectoral fin anterior margin	16.79	9.10
Pectoral fin radial length	8.30	4.50
Pectoral fin base	8.30	4.50
Pectoral fin inner margin	8.30	4.50
Pectoral fin posterior margin	10.33	5.60
Pectoral fin height	11.25	6.10
Pectoral fin length	15.31	8.30
Sub terminal caudal fin margin	3.69	2.00
Sub terminal caudal fin width	1.48	0.80
Terminal caudal fin margin	4.43	2.40
Terminal caudal fin lobe	4.98	2.70
First dorsal fin length	12.92	7.00
First dorsal fin anterior margin	12.73	6.90
First dorsal fin base	8.86	4.80

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Table 1. Morphometric parameters of *Chiloscyllium griseum*

Morphometric parameters	TL* (%)	Cm
First dorsal fin height	6.27	3.40
First dorsal fin inner margin	3.69	2.00
First dorsal fin posterior margin	5.90	3.20
Second dorsal fin length	11.25	6.10
Second dorsal fin anterior margin	11.25	6.10
Second dorsal fin base	7.20	3.90
Second dorsal fin height	5.90	9.20
Second dorsal fin inner margin	4.06	2.20
Second dorsal fin posterior margin	5.90	3.20
Pelvic fin length	12.73	6.90
Pelvic fin anterior margin	11.62	6.30
Pelvic fin base	9.04	4.90
Pelvic fin height	6.83	3.70
Pelvic fin inner margin	5.72	3.10
Pelvic fin posterior margin	9.04	4.90
Anal fin length	12.55	6.80
Anal fin anterior margin	7.75	4.20
Anal fin base	10.52	5.70
Anal fin height	3.14	1.70
Anal fin inner margin	1.29	0.70
Anal fin posterior margin	5.54	3.0
Head height	10.70	5.80
Trunk height	11.99	6.50
Abdominal height	7.75	4.20
Tail height	9.59	5.20
Caudal peduncle height	2.77	1.50
Caudal peduncle width	1.48	0.80
Second dorsal fin insertion anal fin insertion	16.24	8.80
Second dorsal fin origin anal fin origin	13.10	7.10
First dorsal fin midpoint pectoral fin insertion	24.35	13.20
First dorsal fin midpoint pelvic fin origin	11.81	6.40
Pelvic fin midpoint first dorsal fin insertion	7.20	3.90
Pelvic fin midpoint second dorsal fin origin	16.79	9.10
Pre-caudal tail	33.39	18.10
Snout to mouth length	4.43	2.40
Head	16.79	9.10
Trunk	26.75	14.50
Tail	56.46	30.60
Mouth length	0.37	0.20
Mouth width	2.12	4.40
Upper labial furrow length	1.29	0.70
Lower labial furrow length	1.29	0.70
Nostril width	0.50	0.30

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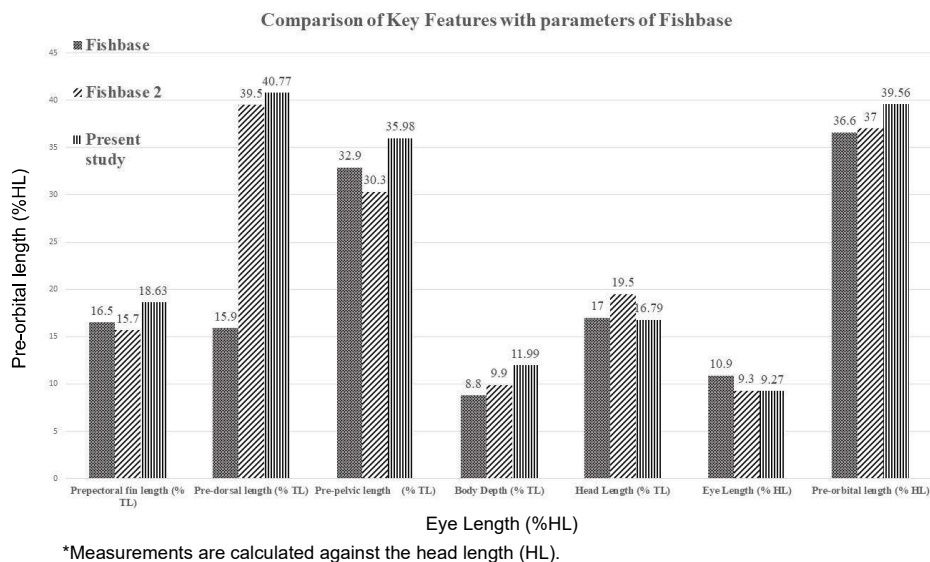


Fig. 3. Comparison of key features of *Chiloscyllium griseum* with Fish base

Table 1. Morphometric parameters of *Chiloscyllium griseum*

Morphometric parameters	TL* (%)	Cm
Inter narial space	4.80	2.60
Anterior nasal flap length	0.18	0.10
Nasal barbel length	2.95	1.60
Nostril snout tip distance	-	-
Mouth eye distance	2.03	1.10
Pre-orbital space	6.09	3.30
Inter orbital space	5.90	3.20
Spiracle length	1.48	0.80
Eye-spiracle space	0.74	0.40
Head width	13.65	7.40
Trunk width	10.89	5.90
Abdominal width	5.72	3.10
Tail width	5.72	3.10
Girth at trunk	42.44	23.00
Girth at abdomen	20.66	11.20
Girth at tail	25.46	13.80
Pre-dorsal ridge	22.88	12.40
Inter dorsal ridge	8.12	4.40
Origin of the anal fin to free rear tip of 2 nd dorsal fin	13.09	7.10
Hypural caudal lobe	16.05	8.70

*All the percentage calculation in above have been done against total length of fish

space between the dorsal fins is relatively short, slightly larger than the base of the first dorsal fin, and it represents 9.59% of the total length. The distance from the snout to the vent is 43.36% of the total length, while the distance from the vent to the tip of the tail is 59.23% of the total length. The

dorsal fins are fairly large and rounded (12.92% TL), approximately the same size as or larger than the pelvic fins (12.73% TL). They do not have concave posterior margins or protruding free rear tips (Fig. 6). The origin of the first dorsal fin is positioned over the rear halves of the pelvic fin bases (Fig. 4.). The base of the first dorsal fin is slightly longer (8.86% TL) than the base of the second dorsal fin (7.20% TL). The height of the first dorsal fin represents 6.27% of the total length, while the height of the second dorsal fin represents 5.90% of the total length. The anal fin originates slightly behind the free rear tip of the second dorsal fin. The length of the anal fin, from its origin to the free rear tip (13.10% TL), is slightly smaller than the length of the hypural caudal lobe (16.05% TL). The base of the anal fin (10.52% TL) is less than six times the height of the anal fin 3.14% of total length (Fig. 8). Similar observations were reported by Compagno (2001).

The information obtained in this research has been compared to Compagno, 2001 (Fig. 2) and Fish base (Fig. 3.) which indicated percentage of all-important characteristics falls within the range of both the FAO standard and Fish base standard. Therefore, it can be inferred that the species under investigation is *C. griseum*. The present investigation revealed that *C. griseum* was first time documented at the Dholai port and along the Arabian Sea coastline in the south Gujarat area.

CONCLUSION

The species was caught from Dholai port, situated on the southwest coast of Gujarat. Further identification of the specimen was done using a standardized procedure, and the recorded data was compared to previous studies by FAO and Fish base. The species in this study was indeed *Chiloscyllium griseum*, commonly known as the Grey

bamboo shark, which according to the IUCN, is a vulnerable species. This study reports the occurrence of *C. griseum* from the southwest coast of Gujarat.

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REFERENCES

- Camhi MD, Valenti SV, Fordham SV, Fowler SL and Gibson C 2009. *The conservation status of pelagic sharks and rays*: Report of the IUCN Shark Specialist Group Pelagic Shark Red List Workshop. IUCN Species Survival Commission Shark Specialist Group. Newbury, UK, p 78.
- Clarke SC, Magnussen JE, Abercrombie DL, McAllister MK and Shivji MS 2006. Identification of shark species composition and proportion in the Hong Kong shark fin market based on molecular genetics and trade records. *Conservation Biology* **20**(1): 201-211.
- Compagno LJV 1973. *Interrelationships of living elasmobranchs* (pp. 15-61 and 2 pls.). In Greenwood PH, Miles R and Patterson C (Eds.), *Interrelationships of fishes*.
- Compagno LJV 2001. Sharks of the world. An annotated and illustrated catalogue of shark species known to date. Bullhead, mackerel and carpet sharks (Heterodontiformes, Lamniformes and Orectolobiformes). FAO Species Catalogue for Fishery Purposes. Rome **2**(1): 172-173.
- IUCN 2020. IUCN Red List of Threatened Species (ver. 2022-2). <https://www.iucnredlist.org/species/161426/109902537>. Accessed 10 May 2023.
- Kizhakudan SJ, Zacharia PU, Thomas S, Vivekanandan E and Muktha M 2015. *Guidance on National Plan of Action for Sharks in India*. CMFRI Marine Fisheries Policy Series No. 2: p. 104.
- Whitley GP 1967. Sharks of the Australasian region. *Australian Zoologist* **14**(2): 173-187.

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