

Filistriatus arabicus, a new species of threadfin (Polynemidae) from the northern Arabian Sea, India

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Abstract

A new species of threadfin, *Filistriatus arabicus* n. sp., is described based on three specimens (163-315 mm total length, TL) collected from the coastal waters of Maharashtra (India), Arabian Sea. The species is distinguished from its congeners by a combination of morphological characters, including, 5 pectoral filaments with length ranging from 35.4-37.8% of standard length, SL, reaching to or slightly extending beyond the pelvic fin tip; absence of a black spot on the anterior lateral line; first dorsal fin with 8 spines, all spines equally robust; second dorsal fin with one spine and 13-14 soft rays; pectoral fin with 15-16 rays, having length 4.5-4.7 in SL and its origin positioned horizontally below the lower end of maxilla; anal fin with 3 spines and 11 soft rays. Body with 6-7 dark stripes along the scale rows above the lateral line, 7-8 scales above and 11-12 scales below the lateral line, an unbranched lateral line with 54-58 scales; 9-11+11-13 (20-24) gill rakers and an upper jaw length of 15-15.1% SL. The distal margins of the dorsal fins, caudal and pectoral fins are black, while the pelvic fin is yellowish to dusky. Mitochondrial DNA analysis based on the cytochrome c oxidase subunit I (COI) gene revealed a sequence divergence of 6.6 to 10.3% from its closest congeners, supporting its status as a distinct species.

Introduction

Fishes of the family Polynemidae, commonly known as threadfins, are epibenthic fishes inhabiting marine, brackish and freshwater environments, associated with sandy or muddy turbid habitats across tropical and temperate regions globally. In areas where they are prevalent, some of these species hold significant commercial value and are part of subsistence, artisanal and semi-industrial fisheries (Motomura, 2004). At present, the family comprises 9 genera and 42 valid species (Fricke *et al.*, 2026). Polynemidae is a family with unresolved systematic placement. It was formerly assigned to the Order Perciformes, but is currently placed within Carangiformes or Carangaria *incertae sedis* (Fricke *et al.*, 2026; Froese and Pauly, 2026). In recent decades, taxonomy of threadfins has improved considerably (Feltjes, 1991; Motomura and Iwatsuki, 2001a, b; Motomura, 2002, 2004; Motomura *et al.*, 2002), and advanced tools have supported

understanding phylogeny and evolution (Girard *et al.*, 2022; Girard and Chovanec, 2025).

At least 11-12 polynemid species are known to occur in Indian waters namely; *Eleutheronema tetradactylum* (Shaw 1804), *Filimanus similis* Feltjes, 1991, *Filimanus perplexa* Feltjes, 1991, *Filimanus xanthonema* (Valenciennes, 1831), *Leptomelanosoma indicum* (Shaw, 1804), *Polydactylus microstoma* (Bleeker, 1851), *Polydactylus mullani* (Hora, 1926), *Filistriatus plebeius* (Broussonet, 1782), *Filistriatus sexfilis* (Valenciennes, 1831), *Polydactylus sextarius* (Bloch & Schneider, 1801), and *Polynemus paradiseus* Linnaeus, 1758. (Motomura, 2004; Barman and Mishra, 2010; Gopalakrishnan *et al.*, 2021; Girard *et al.*, 2022). In a major genetic study by Gopalakrishnan *et al.* (2021), high diversity in threadfins of Indian waters and cryptic species were recognised. Girard and Chovanec (2025) reviewed the genetic phylogeny of Polynemidae using museum-preserved specimens and erected a new genus, *Filistriatus* Girard 2025. This



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genus includes several species previously assigned to the genus *Polydactylus* Lacepède 1803 viz., "*Polydactylus*" *bifurcus* Motomura, Kimura & Iwatsuki 2001, "*P.*" *plebeius*, "*P.*" *sexfilis* and tentatively "*Polydactylus*" *siamensis* Motomura, Iwatsuki & Yoshino, 2001.

A new species of *Filistriatus* is described herein, based on three specimens collected from Mumbai, Maharashtra, during a routine fishery survey in 2014, which was initially identified as belonging to the genus *Polydactylus*, following the diagnostic features outlined by Motomura (2004). However, subsequent detailed examination revealed significant variations in both morphological characters and genetic composition from known congeners, confirming their distinctness, and therefore described here as a new species.

Materials and methods

Counts and measurements generally followed Hubbs and Lagler (1947) and Feltes (1991), with some modifications following Motomura *et al.* (2000, 2002) and Motomura (2004). Standard length is abbreviated as SL, others are mentioned wherever necessary. All measurements were recorded to the nearest 0.1 mm.

The specimens examined, including types, are deposited in the collections of the ICAR-Central Marine Fisheries Research Institute (ICAR-CMFRI), Mumbai Regional Station, Maharashtra. Genomic DNA was extracted by the standard protocol of Miller *et al.* (1988) and partial sequence information of mitochondrial cytochrome c oxidase subunit I (COI) gene were generated following the methods described by Hall (1999) and Ward *et al.* (2005). and the resulting sequences were deposited in the NCBI database (Accession Nos. MF281387.1-MF281388.1).

Results and discussion

Filistriatus arabicus new species

Order: Carangaria *incertae sedis*

Family: Polynemidae Rafinesque, 1815

Genus: *Filistriatus* Girard 2025

Species: *Filistriatus arabicus* n. sp. ((Fig.1- 3, Table. 1)

Zoobank ID: 2AEB877-922D-4E94-AE5F-8104137DEC54

Polydactylus sp. in A. Gopalakrishnan *et al.* (2021)

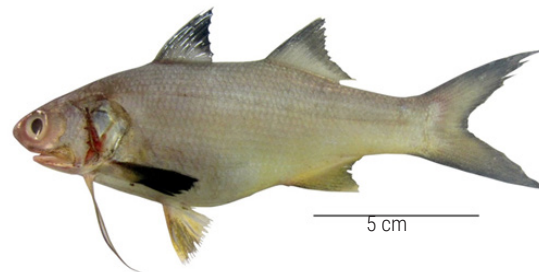


Fig. 1. *Filistriatus arabicus* n. sp., holotype, CMFRI MR 40, 163 mm TL, Mumbai, Arabian Sea, India (fresh)



Fig. 2. *Filistriatus arabicus* n. sp., holotype (after preservation), CMFRI MR 40, 163 mm TL, Mumbai, Arabian Sea, India



Fig. 3. *Filistriatus arabicus* n. sp., freshly collected paratype, CMFRI MR 113, 275 mm TL, Mumbai, Arabian Sea, India

New English name: Arabian five-finger threadfin

Holotype: CMFRI MR 40, 163 mm TL, Sassoon Dock (Mumbai), Arabian Sea, India, Gillnet catch, collected by Akhilesh. K.V, September 2014

Paratype: CMFRI MR 113, 224 mm TL, Alibaug (Mumbai), Arabian Sea, India, Gillnet catch, collected by Akhilesh. K.V, September 2016. CMFRI MR 100, 315 mm TL, Sassoon Dock (Mumbai), Arabian Sea, India, Gillnet catch, collected by Akhilesh. K.V, May 2016.

Diagnosis

A species of *Filistriatus* with five pectoral filaments, pectoral filament length 35.4-37.8% SL, 2.6-2.8 in SL, reaching to or extending slightly beyond pelvic fin tip; first dorsal fin with 8 spines, all spines almost equally robust (or first slightly bigger than others in CMFRI MR 100); second dorsal fin with 1 spine and 13-14 soft rays; anal fin with 3 spines and 11 soft rays, pectoral fin rays 15-16, all rays unbranched, 21-22% SL, length 4.5-4.7 in SL, tip not reaching posterior tip of pelvic fins; scale rows above lateral line 7-8, below 11-12; lateral line unbranched, 54-58 lateral line scales; gill rakers 9-11+11-13 (20-24); occipital profile nearly straight; posterior margin of maxilla reaching to vertical through posterior margin of adipose eyelid; posterior maxilla depth 3.6-3.8% SL, 8.4-8.5 in HL, maxilla depth less than orbit diameter, nearly half orbit diameter. Upper jaw length 15-15.3% SL. Body depth 3.2-3.4 in SL. Six to seven dark stripes (occasionally faint) above the lateral line; those below the lateral line are faint or absent. Head and body yellowish silver to dusky dorsally, lighter on the ventral side. Dorsal and caudal fins dusky with black posterior margins and tips. Pectorals dusky brown to black; pelvic fins anteriorly yellowish to dusky, posterior side lighter.

Description

Counts and measurements are given in Table. 1. A medium-sized species (possibly growing up to 40 cm TL). Body oblong and slightly compressed. Body depth at first dorsal fin origin nearly equal to head length; body width 2-2.3 in depth at first dorsal fin origin; head length 30.9-32% of SL, 3.1-3.2 in SL. Head length slightly larger or nearly equal to body depth. Snout pointed, snout length 5.6-6.2 in HL, occipital profile nearly straight. Eyes large, 6.7-7.2% SL, 4.3-4.8 in HL, larger than snout, 0.7-0.9 in snout length. Eyes covered with the adipose eyelid; length of adipose eye 2.2-2.4 in HL; posterior margin of maxilla reaching to or extending beyond posterior margin of adipose eyelid; interorbital width 3.8-4.1 in HL.

Maxilla without scales; posterior maxilla depth less than eye diameter, 0.5-0.6 in orbit diameter; posterior nostril (adjacent to the eye) larger than anterior nostril. Mouth large and inferior; upper-jaw length 15-15.3% of SL, 2.0-2.1 in HL; teeth villiform restricted to the dorsal surface; teeth villiform in broad bands on vomer, palatines. Lower lip well developed; margin of preopercle serrated.

Pre-dorsal 2.7-2.8 in SL. First dorsal origin between pectoral insertion and pelvic origin, fin membranes scaly; first dorsal fin spines of similar thickness (first slightly thicker in CMFRI MR 100), 5.5-10.6 in orbit diameter; first dorsal second spine height 0.7-0.8 in first dorsal base length, first dorsal third spine longest length 1.4-1.7 in HL; first dorsal base 2.1-2.2 in HL; second dorsal first spine

3.8-4.1 in HL; anal fin base slightly shorter than the second dorsal fin base, larger than first.

Pectoral fin origin below the lateral line. All pectoral rays unbranched, pectoral fin length 21.3-22% of SL, the posterior tip of pectorals not reaching to level of the posterior tip of pelvic fin; longest pectoral filament 35.4-37.8% of SL, reaching to or slightly extending beyond level of the posterior tip of pelvic fin.

Caudal fin deeply forked, upper and lower caudal-fin lobes not filamentous, upper caudal-fin lobe 38.1-42.8% SL and lower lobe 34.8-38.8% SL. Pored lateral line scales 54-58, lateral line simple and unbranched, extending from the upper end of the gill opening to the upper end of the lower caudal-fin lobe; scale rows above lateral line 7-8, below 11-12. Caudal peduncle depth 2.1-2.2 in HL, caudal peduncle lower length 1.9 in HL.

Colour

Head and upper lateral sides of trunk yellowish-silver to dusky, becoming lighter on lower sides; abdominal region white. Snout semi-transparent; dorsal fins and caudal fin dusky with blackish posterior margins; pectoral fin membrane dusky brown to blackish; pectoral filaments pale or yellowish to dusky. Anterior margins and origins of pelvic and anal fins yellowish to dusky, other parts pale, often with melanophores; six to seven prominent dark stripes along scale rows above the lateral line, stripes absent or non-distinguishable in the lower part. In smaller specimens, the stripes above the lateral line are often not visible (Fig. 1).

Distribution

Currently known only from the Arabian Sea, off Mumbai (Maharashtra, India). The species may have a wider distribution along the northern Arabian Sea coasts

Etymology

The specific epithet "*arabicus*" refers to the type locality, the Arabian Sea.

Genetic studies

Filistriatus arabicus n. sp., from Mumbai, India, exhibited a genetic divergence of 6.6 to 10.3% from its closest congener *Filistriatus plebeius*. Based on COI gene sequences available in the public domain and also using those generated by Gopalakrishnan et al. (2021), a neighbor-joining tree (Fig. 4) was constructed, and Kimura 2-parameter (K2P) distances were calculated. *Filistriatus arabicus* n. sp. was positioned as a distinct clade alongside other *Filistriatus* species, which supported the distinct taxonomic status of *F. arabicus*.

Remarks and comparisons

The genus *Filistriatus* currently comprises five valid species distributed across the Indo-Pacific (Girard et al., 2025; present study). Among these, *F. plebeius* and *F. sexfilis* have wide distribution

Table. 1. Counts and measurements of *Filistriatus arabicus* sp. nov. and closely related species (Measurements in % SL)

Count/Measurement	<i>Filistriatus arabicus</i>	<i>Filistriatus arabicus</i>	<i>Filistriatus arabicus</i>	<i>Filistriatus arabicus</i>	<i>Filistriatus siamensis</i> [#]	<i>Filistriatus siamensis</i> [#]	<i>Filistriatus plebeius</i> [#]	<i>Filistriatus plebeius</i> [#]
	Holotype MR 40	Paratype MR	Paratype MR100	Range	Holotype (URM-P 14050)	range (n = 6)	Neotype FMNH 108655	Range (n = 109)
Total length	162.9	275.0	314.6					
Fork length (mm)	135.4	231.4	252.2	135.4-252.2	274	144-263	100	50-365
Standard length (mm)	119.5	207.4	230.1	119.5-230.1	252	128-239	88	43-331
Counts								
Dorsal fin rays	VIII-I, 13	VIII-I, 13-14	VIII-I, 13	VIII-I, 13-14	VIII-I, 13	VIII-I, 12-13	VIII-I, 13	VIII-I, 12-13
Anal fin rays	III, 11	III, 11	III, 11	III, 11	III, 11	III, 11	III, 11	III, 11-12
Pectoral fin rays	16	16	15	15-16	15	15	18	15-18
Pectoral filaments	5	5	5	46147	5	5	5	5
Pelvic fin rays	I, 5	I, 5	I, 5	I, 5-1, 5	I, 5	I, 5	I, 5	I, 5
Pored lateral line scales	56	58	56	56-56	58	54-57	63	60-68
Scales above and below lateral line	7-11	7-12	8-11	7-8/11-12	7-11	7-11	8-12	8-9 / 12-13
Gill rakers	11+13 = 24	9 + 11 = 20	10 + 12 = 22	9-11+11-13 = 20-24	9+13 = 22	10 + 13-14 = 23-24	11 + 14 = 25	9-14 + 13-18 = 24-32
Measurements (% SL)								
Head length	32.0	30.9	30.9	30.9 - 32.0	31	31-34 (32)	32	25-34 (31)
Body depth at first dorsal origin	31.2	30.0	29.7	29.7 - 31.2	33	30-33 (32)	30	25-32 (28)
Body depth at second dorsal origin	31.1	31.5	29.6	29.6 - 31.5	34	31-33 (32)	29	25-34 (30)
Body width at pectoral fin base	14.7	13.6	12.1	12.1 - 14.7	16	15-18 (16)	15	11-17 (14)
Snout length	5.7	5.0	5.6	5.0 - 5.7	7	5-8 (6)	6	5-9 (6)
Orbit diameter	6.7	6.8	7.2	6.7 - 7.2	8	8-9 (8)	9	7-11 (9)
Interorbital width	7.7	8.0	8.2	7.7 - 8.2	7	8-9 (8)	10	7-10 (8)
Postorbital length	20.9	20.1	19.7	19.7 - 20.9	20	19-21 (20)	18	15-20 (18)
Upper jaw length	15.3	15.0	15.1	15.0 - 15.3	16	16-17 (17)	16	13-16 (15)
Lower jaw length	13.4	13.0	12.6	12.6 - 13.4	-	-	-	-
Pre-1st dorsal fin length	35.8	36.5	37.0	35.8 - 37.0	37	37-40 (38)	38	33-38 (36)
Pre-2nd dorsal fin length	61.6	58.8	61.7	58.8 - 61.7	63	62-66 (64)	62	57-63 (61)
Preanal fin length	64.8	66.1	64.2	64.2 - 66.1	68	64-68 (66)	62	59-67 (63)
Pre-pelvic length	40.8	41.5	40.3	40.3 - 41.5	-	-	-	-
Pre-pectoral length	29.0	30.1	29.1	29.0 - 30.1	-	-	-	-
First dorsal fin origin to anal fin origin	43.9	43.0	41.2	41.2 - 43.9	44	42-45 (44)	40	37-45 (42)
Pelvic fin origin to anal fin origin	27.8	27.5	26.9	26.9 - 27.8	29	22-28 (26)	24	22-28 (25)
Height of first dorsal fin	18.6	19.8	19.8	18.6 - 19.8	-	-	-	-
Length of first dorsal fin	20.7	21.2	22.2	20.7 - 22.2	-	-	-	-
Length of first dorsal fin base	14.4	14.7	13.8	13.8 - 14.7	-	-	-	-
Length of first dorsal spine	0.6	0.7	1.3	0.6 - 1.3	-	-	-	-
Length of second dorsal spine	17.4	20.8	18.4	17.4 - 20.8	-	-	-	-
Longest 1st dorsal fin spine length (3 rd)	19.1	21.9	20.4	19.1 - 21.9	19	19-23 (21)	21	17-24 (21)
Length of second dorsal fin	24.5	25.8	23.8	23.8 - 25.8	-	-	-	-
Height of second dorsal fin	14.8	16.8	16.3	14.8 - 16.8	-	-	-	-
Second dorsal fin base length	19.7	19.6	16.6	16.6 - 19.7	17	15-17 (17)	16	15-19 (17)
Interdorsal length	11.9	10.0	11.2	10.0 - 11.9	-	-	-	-
Anal fin length	25.6	23.6	24.0	23.6 - 25.6	-	-	-	-
Height of anal fin	10.7	15.5	14.6	10.7 - 15.5	-	-	-	-
Anal fin base length	16.9	17.2	16.6	16.6 - 17.2	15	14-17 (16)	16	14-18 (16)
Pectoral fin length	22.0	21.7	21.3	21.3 - 22.0	20	20-22 (21)	20	17-28 (20)
Pectoral filament length	37.8	35.4	35.7	35.4 - 37.8	34	31-43 (36)	39	22-40 (32)
Pectoral fin base	4.6	4.3	4.0	4.0 - 4.6	11	10-11 (11)	9	9-11 (9)
Body depth at anal fin origin	27.6	29.5	27.2	27.2 - 29.5	-	-	-	-
Body width at anal origin	11.2	12.2	11.2	11.2 - 12.2	-	-	-	-
Longest anal fin ray length (2 nd)	20.5	20.9	17.4	17.4 - 20.9	19	20-23 (21)	14	17-23 (19)
Caudal peduncle depth	14.7	14.9	13.9	13.9 - 14.9	15	14-16 (15)	14	12-16 (14)
Caudal peduncle length (L)	16.5	16.6	16.7	16.5 - 16.7	24	22-25 (24)	26	23-27 (25)
Upper caudal fin lobe length	38.1	39.5	42.8	38.1 - 42.8	37	38-41 (40)	39	33-44 (39)
Lower caudal fin lobe length	34.8	38.8	37.9	34.8 - 38.8	33	34-37 (35)	35	30-41 (36)

[#]Source: Motomura *et al.* (2001)

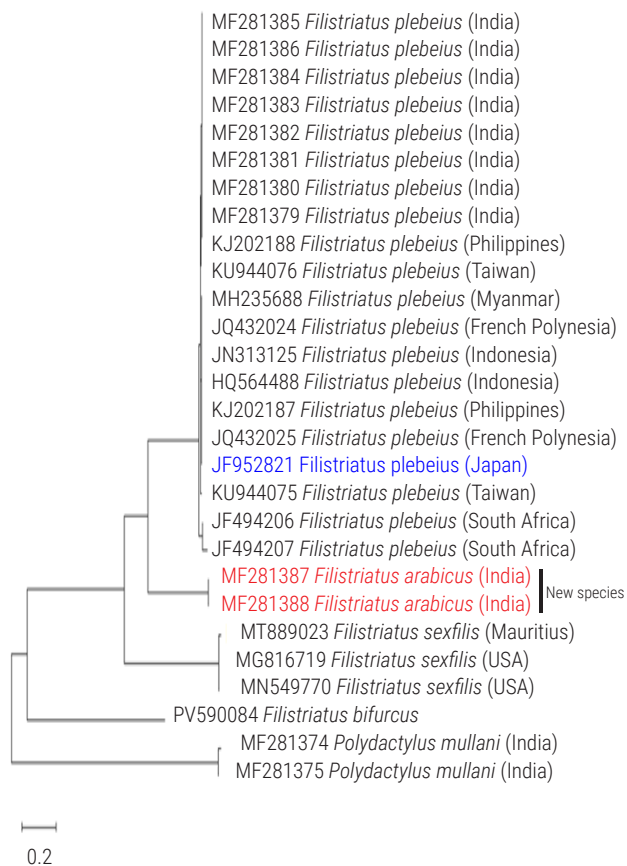


Fig. 4. Neighbor-joining tree of mtDNA COI sequences of *Filistriatus* species available in GenBank. The scale bar at left indicates a 2% sequence difference.

throughout the Indo-Pacific, whereas *F. siamensis* is restricted to the Andaman Sea off Thailand, and *F. bifurcus* is known from the Western Pacific, particularly Indonesia.

Filistriatus arabicus n. sp. can be easily distinguished from most other threadfin species by the presence of five pectoral filaments, distinct longitudinal body stripes and the absence of a black spot on the anterior portion of the lateral line. It can be further differentiated from *Polydactylus macrochir* (Gunther 1867), another five-filament spotless threadfin, however, known from southern Australia and Papua New Guinea, by several diagnostic characters viz. shorter pectoral filaments (35.4-37.8% SL vs. 40-43% SL in *P. macrochir*), lower gill raker count (20-24 vs. GR 32-35 in *P. macrochir*), lower lateral line scale counts (54-58 vs. 70-76 in *P. macrochir*), and shorter pectoral fin length (21.3-22% SL vs. 22-27% SL in *P. macrochir*) (Motomura 2002; Motomura et al. 2002). *Filistriatus arabicus* n. sp. can be differentiated from *F. bifurcus* by the presence of an unbranched lateral line as opposed to a bifurcated lateral line on the caudal fin in *F. bifurcus*. It also differs in having lower lateral line scale counts (54-58 vs. 69 in *F. bifurcus*) (Motomura et al., 2001a).

Filistriatus arabicus n. sp., closely resembles *F. plebeius* (Fig. 5) in several morphological characters; it can be differentiated by a combination of meristic and morphometric differences. These include; lower counts of pectoral-fin rays (15-16 vs. 15-18 in *F. plebeius*), the presence of 6-7 longitudinal stripes above the lateral line, and lower scale counts above and below the lateral line (7-8 and 11-12, vs. 8-9 and 12-13, respectively). It also differs in having lower gill raker count (9-11 in the upper series, 11-13 in the lower series and 20-24 in total vs. 9-14, 13-18, and 24-32, respectively in *F. plebeius*); and fewer lateral line scales (54-58 vs. 60-68 for *F. plebeius*) (Motomura et al., 2001b).

The genetic distance between *Filistriatus arabicus* n. sp and *F. plebeius* was 6.6% to 10.3%. While intraspecific COI divergence is generally low, the higher interspecific divergence observed here (<2% within species vs. higher values between species) further supports the distinct status of the new taxon (Hebert et al., 2003; Ward, 2009). *F. plebeius* has been reported from Pakistan, Iran, Oman and Socotra (Motomura et al., 2001b; Bogorodsky et al., 2020; Moazzam and Osmany, 2025), which needs to be compared with the newly described species *F. arabicus*.



Fig. 5. *Filistriatus plebeius*, CMFRI MR 150, 220 mm TL, Muttom, Tamil Nadu, India

Filistriatus arabicus n. sp. closely resembles *F. siamensis* in several morphological features, but can be differentiated based on a combination of morphometric differences. It has a narrower body at the pectoral fin base (12.1-14.7% SL vs. 15-18% SL in *F. siamensis*); smaller orbit diameter (6.7-7.2 vs. 8-9 in *F. siamensis*); shorter upper jaw length (15 vs. 16-17% SL) and a shorter lower caudal peduncle length (16.5-16.7 vs. 22-25% SL). Further, anal fin base length in *Filistriatus arabicus* n. sp. (16.6-17.2% SL) slightly overlaps but is generally comparable to that of *F. siamensis* (14-17% SL). *F. siamensis* is currently known only from the Gulf of Thailand and the Andaman Sea (Motomura *et al.*, 2001b).

Several polynemid species are known to exhibit restricted distributions (Motomura, 2004). Similarly, it is expected that *Filistriatus arabicus* n. sp. is endemic to the northern Arabian Sea. Despite extensive sampling conducted during the course of this study, along the Indian coast, including the island regions, no additional specimens of *F. arabicus* were obtained, suggesting that the species is either rare or has a highly restricted distribution. The northern Arabian Sea is considered as a region of significant zoogeographical and ecological importance, within the broader Arabian seas, often supporting endemism, distinct species assemblages and community structure.

The present study acknowledges certain limitations, including the limited number of specimens examined and the lack of comprehensive comparative genetic analyses. In view of this, further investigations incorporating additional material from the northern Arabian Sea, along with detailed morphological and molecular comparisons are recommended. Such efforts would enhance the understanding of intraspecific variations in threadfins and help clarify the distribution patterns of species within the family.

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