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Sivabalan P

Fishery Survey of India,
Fishing Harbour Complex,
Chennai Tamil Nadu India

Anrose A

Fishery Survey of India,
Fishing Harbour Complex,
Chennai Tamil Nadu India

Chezhan Y

Jeevan Research Foundation,
Chennai Tamil Nadu India

An overview of threadfins fishes (Family: Polynemidae) in coastal district of Eastcoast of Tamil Nadu

Sivabalan P, Anrose A and Chezhan Y

Abstract

In the case of the marine biodiversity of India, the number of species known could be of the order of 13,000 or higher (Ramakrishna and Venkataraman 2001). The family Polynemidae usually known as thread-fins; name resulting from the occurrence of numerous slim or slender filaments on the lower part of the pectoral fin, number and the nature of these free filamentous rays assist the systematic arrangement of species. Present studies deal with the overview, diversity and population density of the thread-fins (Family: Polynemidae) fishes of the south east coast of Tamil Nadu. The coastal district of Tamil Nadu in the present study showed five fish species spread over 3 genera, 1 family and 1 order.

Keywords: Polynemidae, coastal district, East Coast and Tamil Nadu

Introduction

In marine ecosystem fishes are the complete living vertebrate which are half in diversity. Taxonomically diversified and wealth ecosystems is represented of coastal plains and seas of the earth. In the case of the marine biodiversity of India, the number of species known could be of the order of 13,000 or higher. The coastline of Tamil Nadu has a length of about 1076kms, constitutes about a 15% of the total coastal length of India and stretches along Bay of Bengal, Arabian Sea and Indian Ocean. The family Polynemidae usually known as thread-fins; name resulting from the occurrence of numerous slim or slender filaments on the lower part of the pectoral fin, number and the nature of these free filamentous rays assist the systematic arrangement of species, polynemids are hermaphroditism. They occur primarily in shallow muddy bottom in the coastal waters, Juveniles are found in estuaries. They are contributing to the regional significant; Polynemids are most highly esteemed table fishes. Especially *Eleutheronema tetradactylum* and *Ploynemus indicus* they occur all along the east and the west of India some of the species Being migratory fishes, as a minimum they occur not only in the ocean but also in the river mouth and estuaries. Polynemids plays an imperative role in the nationwide economy, due to they are being favored as enormously good eating fishes with broad cyclic and spatial distribution range, so this kind of group comprises a reserve. Present studies deal with the overview, diversity and population density of the thread-fins (Family: Polynemidae) fishes of the south east coast of Tamil Nadu.

Material and Methods

Fish samples were collected during the period from Oct-2012 to Sep-2013 of 13 Coastal district of Tamil Nadu; viz. Chennai, Cuddalore, Kanchipuram, Kanyakumari, Nagapattinam, Pudukottai, Ramanthapuram, Thanjavur, Thiruvallur, Thiruvarur, Tirunelveli, Tuticorin and Villupuram, samples and data were collated and observed from fishing landing centers; few samples was collected for identification purpose; samples were preserved into 37% formalin. Fish diversity was calculated using PAST software.

Result

The coastal district of Tamil Nadu in the present study showed five fish species spread over 3 genera, 1 family and 1 order (Table 1). However, the systematic and diagnostic characters were provided for all five species. Highest number of fish species represented in the genus *Polydactylus* followed by genus *Eleutheronema* and *Filimanus* shows each one species. Species richness and population density were calculated and discussed in detail in present study area (Table 2 & 3).

Correspondence

Sivabalan P

Fishery Survey of India,
Fishing Harbour Complex,
Chennai Tamil Nadu India

Table 1: List of species available in the study area.

S. No.	Order	Family	Genus	Species
1	Perciformes	Polynemidae	Eleutheronema	<i>Eleutheronema tetradactylum</i>
2			Polydactylus	<i>Polydactylus plebeius</i>
3				<i>Polydactylus sexfilis</i>
4				<i>Polydactylus sextarius</i>
5			Filimanus	<i>Filimanus heptadactyla</i>

Systematic Accounts**Genus** Eleutheronema Bleeker, 1862**1. *Eleutheronema tetradactylum* (Shaw, 1804)***Eleutheronema tetradactylum* (Shaw, 1804)*Polydactylus rhadinus* Jordan & Evermann, 1902

Distinctive Characters: The largest of the threadfins. Body more or less elongate and compressed. Snout projecting, mouth very large, with small teeth; lips absent, except for lower lip near corner of mouth; eyes large (eye diameter 4.5 to 5 times in head length). Pectoral fins in 2 parts, upper part with all rays unbranched, lower with 4 free filamentous rays of which the upper filament is the longest, reaching to pelvic fin base; caudal fin forked with lobes equal.

Scales small, ctenoid (rough to touch).

Colour: body silvery green above, cream below; dorsal and caudal fins grey, dusky at edges, pelvic and anal fins orange, pectoral filamentous rays white.

Genus: Filimanus Myers, 1936**2. *Filimanus heptadactyla* (Cuvier, 1829)***Polydactylus heptadactylus* (Cuvier, 1829)*Polydactylus multiradiatus* (Günther, 1860)*Polydactylus sextarius* (Bloch, 1801)*Polynemus heptadactylus* Cuvier, 1829*Trichidion heptadactylum* (Cuvier, 1829)*Filimanus similis* (Feltes, 1991)

Distinctive Characters: Body oblong and somewhat compressed. Snout projecting, mouth large, with small teeth; upper lip absent, lower lip well developed; eyes large (eye diameter 3.5 times in head length), with adipose tissue. Pectoral fins in two parts, upper part with all rays unbranched, lower with 7 free filamentous rays, of which the 3rd, 4th and 5th are the longest reaching to anal fin; caudal fin forked with lobes equal. Scales large, ctenoid (rough to touch).

Colour: back brown, flanks golden; pectoral fins black, as also margins of other fins.

Genus Polydactylus Lacepede, 1803**3. *Polydactylus plebeius* (Broussonet, 1782)***Polydactylus plebeius* (Broussonet, 1782)*Polydactylus agonasi* Jordan & McGregor, 1906*Polydactylus microstoma* (Bleeker, 1851)*Polydactylus plebejus* (Broussonet, 1782)*Polynemus agonasi* (Jordan & McGregor, 1906)*Polynemus commersonii* Shaw, 1804*Polynemus emoi* Lacepede, 1803*Polynemus lineatus* Günther, 1860*Polynemus lineatus* Lacepede, 1803*Polynemus lydiae* Curtiss, 1938*Polynemus niloticus* Shaw, 1804*Polynemus plebeius* Broussonet, 1782*Polynemus plebejus* Broussonet, 1782*Polynemus plebius* Broussonet, 1782*Polynemus taeniatus* Günther, 1860*Trichidion plebejum* (Broussonet, 1782)

Distinctive Characters: Body oblong and somewhat compressed. Snout projecting, mouth large, with small teeth; upper lip absent, lower lip well developed; eyes large (eye diameter 3.8 to 4.0 times in head length), with adipose tissue. Pectoral fins in two parts, upper part with all rays unbranched; lower part with 5 free filamentous rays, of which the upper 2 are the longest reaching to end of pelvic fin; caudal fin with lobes equal. Scales small, ctenoid (rough to touch).

Colour: body golden olive, with narrow dusky stripes; pectoral fins black, inner side of pelvic fins white, outer side grey, dorsal and caudal fins grey-edged.

4. *Polydactylus sexfilis* (Valenciennes, 1831)*Polynemus xanthonema* Valenciennes, 1831*Filimanus xanthonema* (Valenciennes, 1831)*Polydactylus multiradiatus* (Günther, 1860)*Polydactylus sexfilis* (Valenciennes, 1831)*Polydactylus sextarius* (Bloch & Schneider, 1801)*Polydactylus xanthonemus* (Valenciennes, 1831)*Polynemus diagrammicus* Bleeker, 1849*Polynemus pfeifferi* Bleeker, 1853*Filimanus similis* (Feltes, 1991)*Polydactylus konadaensis* Mishra & Krishnan, 1993



Distinctive Characters: Body oblong and somewhat compressed. Snout projecting, mouth moderately large, with small teeth; upper lip absent, lower lip well developed; eyes moderate in size (eye diameter 4.5 times in head length), with adipose tissue. Pectoral fins in two parts, upper part with unbranched rays; lower part with 6 free filamentous rays, of

which the upper 2 are the longest reaching to tip of pelvic fin; caudal fin forked with lobes equal. Scales small, ctenoid rough to touch).

Colour: golden, pectoral fins deep black, anal fin with a black margin, pelvic fins dark in the middle.

5. *Polydactylus sextarius* (Bloch and Schneider, 1801)

Polynemus sextarius Bloch & Schneider, 1801

Polydactylus sextarius (Bloch & Schneider, 1801)

Trichidion sextarius (Bloch & Schneider, 1801)

Filimanus heptadactyla (Cuvier, 1829)

Polydactylus sexfilis (Valenciennes, 1831)



Distinctive Characters: Body oblong and somewhat compressed. Snout projecting, mouth moderately large, with small teeth; upper lip absent, lower lip well developed; eyes large (eye diameter 3.0 to 3.8 times in head length), with adipose tissue. Pectoral fins in two parts, upper part with almost all rays branched, lower part with 6 free filamentous rays, of which the upper 2 are the longest reaching to tip of pelvic fin; caudal fin forked with lobes equal. Scales small, ctenoid (rough to touch).

Colour: golden olive above, silvery below; fins yellowish with black spots; inner side of gill cover pigmented with

black; a large black blotch at beginning of lateral line. During the study period the fish populations in coastal districts of Tamil Nadu ranged from 9 to 210 cumulative individuals, highest population was recorded in Nagapattinam district followed by Thanjavur, Pudukottai, Thiruvarur, Thiruvallur and least population were recorded in Tirunelveli district (Table 2). Total individual population of fishes in study area is 5237 in which *Polydactylus plebeius* (2055) contributed high volume, followed by *Eleutheronema tetradactylum* (1144), *Polydactylus sextarius* (996), *Polydactylus sexfilis* (868) and the least volume of contribution is *Filimanus heptadactyla* (174) (Figure 1).

Table 2: Total species collected in study area district wise

S. No.	Coastal district	<i>Eleutheronema tetradactylum</i>	<i>Polydactylus plebeius</i>	<i>Polydactylus sexfilis</i>	<i>Polydactylus sextarius</i>	<i>Filimanus heptadactyla</i>	Total
1	Chennai	72	145	90	73	12	392
2	Cuddalore	81	163	69	51	09	373
3	Kanchipuram	91	151	57	76	19	394
4	Kanyakumari	92	162	61	63	14	392
5	Nagapattinam	89	210	98	81	21	499
6	Pudukottai	98	184	74	58	15	429
7	Ramanthapuram	89	156	75	60	10	390
8	Thanjavur	91	198	65	75	12	441
9	Thiruvallur	89	138	92	67	17	403
10	Thiruvarur	95	147	83	66	15	406
11	Tirunelveli	80	121	76	59	10	346
12	Tuticorin	91	136	80	68	11	386
13	Villupuram	86	144	76	71	09	386
Total		1144	2055	996	868	174	5237

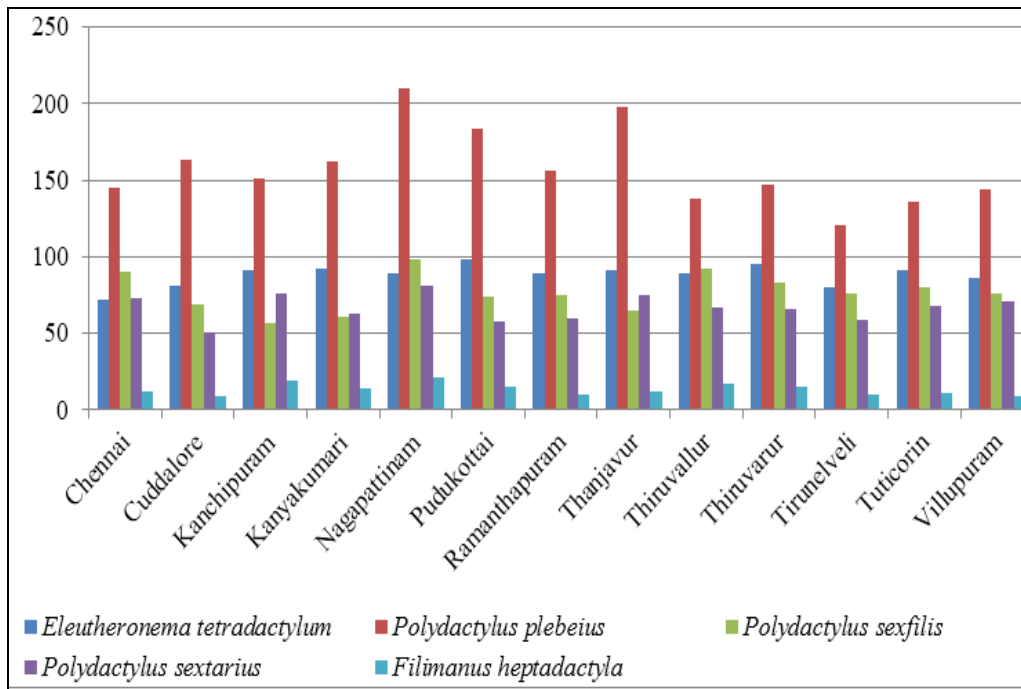


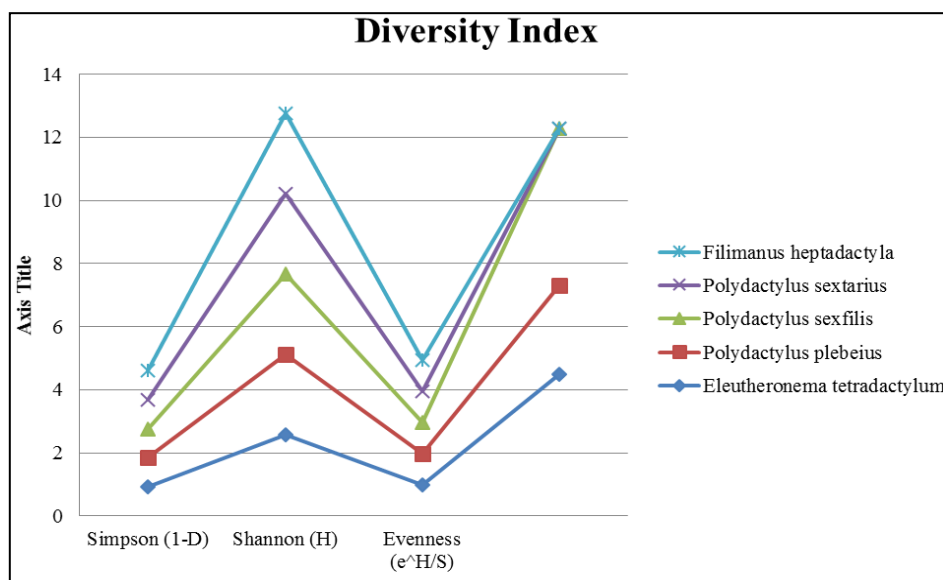
Fig 1: Total population of individual of study area

Table 3: Diversity Index of Identified fish species in the study area

Diversity Index	<i>Eleutheronema tetradactylum</i>	<i>Polydactylus plebeius</i>	<i>Polydactylus sexfilis</i>	<i>Polydactylus sextarius</i>	<i>Filimanus heptadactyla</i>
Simpson (1-D)	0.9226	0.9212	0.9213	0.9219	0.9172
Shannon (H)	2.562	2.553	2.553	2.557	2.528
Evenness (e ^H /S)	0.9971	0.9884	0.9885	0.9925	0.9635

Diversity index is estimated through Shannon, Simpson and Evenness, Shannon index ranged from 0.9172 to 0.9226, Simpson index ranged from 2.528 to 2.562 and Evenness

ranged from 0.9635 to 0.9971 (Table 3). However Shannon index and Shannon index shows less in *Filimanus heptadactyla* and high in *Eleutheronema tetradactylum*.



Conclusion

The purpose of this study to review and conclude that the decline of family Polynemidae in southeast cost of Tamil Nadu. The water quality is one of major factor to increase the decline ratio of thread-fins fishes or marine diversity; by oil, chemical and biological wastage and in some circumstance climatic changes also decisive decline ratio. This astounding loss of biodiversity, defined as the variety of life forms and processes, can be directly linked to the activities of an

overgrown and over-consumptive human population (Groom *et al.* 2006) [7]. Extinction is a natural process, and natural processes can be characterized by average rates. Historically, extinction rates for animals average 9% of existing species every million years, or one to two species per year (Helfman S., 2009) [6]. Human alteration of aquatic habitats is the most commonly cited cause of declines in fin-fishes populations. Marin diversity and sustainability will be protect to abide by following criteria such as do not harvest the fish during the

spawning period, cut out harvest juveniles, to educate locals fisherman's of impacts of pollution with chemicals wastes and anthropogenic activities led to the degradation of southeast coast of Tamil Nadu. Hence, conservation and management strategy is needed to conserve this important ecosystem and thread-fins fish population.

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