

Assessment of Fish Diversity in the estuarine area of Bhayander and Naigaon, Thane (M.S.) IndiaDevdatta Lad and Shashikant Patil¹

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¹Department of Zoology, Mithibai College of Arts, Chauhan Institute of Science,
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devdatta.lad@gmail.com**ABSTRACT**

The present study has been conducted to assess the fish diversity profile in a stretch of estuarine area of Bhayander and Naigaon of Thane district of the Maharashtra state. During the fish diversity study at both the selected stations of Bhayander and Naigaon, 53 fish species belonging to 23 families and 6 orders were observed. Out of 6 orders the order Acanthopterygii is found to be dominant with 2/3rd species i.e. 37 species of fishes belonged to it. The study also reveals that the fish diversity along the estuarine area of Bhayander and Naigaon was satisfactory as compared with the fish diversity of other estuaries.

Keywords: Bhayander, Naigaon, Fish diversity, Elasmobranchii, Teleostomi.

INTRODUCTION

India is endowed with an extensive coastline of 7516 Km and an Exclusive Economic Zone of 2.04×10^6 Km² (Venkataraman *et al.*, 2005). Estuaries are an integral part of the coastal environment. The mangrove ecosystem of estuaries in India act as nursery ground for a variety of shrimps, crabs and finfishes. (Balasubramanian *et al.*, 2002) However, many estuaries are getting polluted due to their use as dumping grounds for domestic sewage, industrial effluents and the solid wastes. Hence it is necessary to carefully assess from time to time, the ecological conditions and the status of diversity in these ecosystems.

The aquatic environment is an enormously rich resource that offers good base of food. Fishes form one of the most important groups of vertebrates, influencing life in various ways. Fish plays an important role, as it is not only useful for food but also be used in recreation and biological control. The Thane district alone shares about 23.6% of the total fish landings from Maharashtra (Nair, 1990). Geographically the estuarine area of Bhayander and Naigaon falls nearer to the Vasai creek. But till date no in-depth study and analysis has been done towards the fish diversity along this estuarine area.

Also the mangrove ecosystem along this estuarine area is affected because of illicit cutting,

reclamation, dumping of waste, dredging and various other anthropogenic activities. The loss to the mangrove ecosystem indirectly leads to the loss of the fish diversity. Exploration of coastal areas for studying marine life is very common in India. Earlier workers have studied taxonomy, biodiversity and distribution of fishes viz (Yazdani, 1994; Jayaram, 1995 and Yadav 2003, 2005 and 2008) (Joshi, 2013). Present work deals mainly with diversity of fish along the estuarine area of Bhayander and Naigaon coast.

MATERIAL AND METHODS

The fish diversity of estuarine area along Bhayander and Naigaon was studied for a year i.e. from June 2008 to May 2009. Fish landing center of Bhayander and Naigaon were visited periodically and the fishes were observed and identified upto the species level. Additional data regarding the fish diversity along the estuarine area was also collected and studied through the information provided by the local fisherman. The fish species whose identification could not be done were preserved in 10% formalin and brought to the laboratory for further investigation. The identification of fishes was carried out with the help of standard literature (Day, 1888; Fisher *et al.*, FAO, 1974; Bal and Rao, 1984; Srivastava, 1999; Bhargava *et al.*, 2004; Dawes John, 2006; Gupta *et al.*, 2006).

Study Area

Station 1 Bhayander: a small town in the Thane District of the Maharashtra state. The Bhayander is geographically surrounded by sea from the West side, by the estuary from the north side and by open and occupied land from the south and east side. The estuarine water is mainly from the buffering of Ulhas River with the Arabian sea which empties its water in the Thane creek and Vasai creek. The Station No. 1 Bhayander is located 19° 19' N and 72° 51' E. (Google Earth 2008)

Station 2 PanjuBunder/Naigaon jetty: situated in the Naigaon is also a small town in the Thane District of the Maharashtra state. Around the area fishing activity is carried out in the estuarine water and also there are many saltpans in and around the area which are utilizing the

estuarine water for production of the salt, but this activity mainly goes on during the month of March to May while the rest of the year the saltpans are non-operational. The second station is located 19° 20' N and 72° 51' E. (Google Earth, 2008).

RESULTS AND DISCUSSION

The Fish diversity of Station 1 and 2, i.e. Bhayander and Naigaon respectively was studied for one complete year from June 2008 to May 2009. The present research study on fish diversity has revealed, 53 fish species belonging to 23 families and 6 orders. Out of 6 orders the order Acanthopterygii is found to be dominant more than 2/3rd species i.e. with 37 species of fishes belonging to it.

Table 1: The diversity and density of fish species at Bhayander and Naigaon.

Superclass	Class	Order	Family	Species	Local Name or Common Name	Density at Bhayander	Density at Naigaon
Pisces	Elasmobranchii	Laminiformes	Carcharhinidae	1) <i>Carcharias limbatus</i>	Mushi	+	++
			Sphyrnidae	2) <i>Zygaena malleus</i>	Kanmushi	+	+
		Rajiformes	Rhinobatidae	3) <i>Rhynchobatus djiddensis</i> .	Guitar fish	-	+
	Teleostomi	Acanthopterygii	Percidae	4) <i>Lates calcarifer</i>	Khajura	+	++
				5) <i>Therapon jarbua</i>	Nhavi	++	++
				6) <i>Therapon theraps</i>	Nhavi	++	++
			Mugilidae	7) <i>Mugil speigleri</i>	Boiet	++	+++
				8) <i>Mugil dussumieri</i>	Boiet	++	+++
			Trichiuridae	9) <i>Lepturacanthus lepturus</i>	Wakti	++	++
				10) <i>Trichiurus lepturus</i>	Baga	++	++
			Stromatoidae	11) <i>Pampus argenteus</i>	Paplet	++	++
				12) <i>Pampus chinensis</i>	Kapri – Saranga	++	++
			Apolectidae	13) <i>Apolectis niger</i> .	Halwa	+	++
Pisces	Teleostomi	Carangidae	14) <i>Megalaspis cordyla</i>	Kat - Bangada	++	++	
			15) <i>Equula dussumieri</i>	Pony fish	++	++	
			16) <i>Equula insidiatrix</i>	Slender – barred Pony fish	++	++	
			17) <i>Equula ruconius</i>	Deep – bodied Pony fish	++	++	
			18) <i>Equula splendens</i>	Silver – Belly	++	++	
		Polynemidae	19) <i>Eleutheronema tetradactylus</i>	Rawas	++	++	
			20) <i>Polynemus indicus</i> .	Dara	++	++	
			21) <i>Polynemus heptadactylus</i> .	Shende	++	++	
		Scombridae	22) <i>Echeneis naucrates</i>	Sucker – fish	+	+	
			23) <i>Scomber microlepidotus</i>	Bangada	+	+++	
			24) <i>Scomberomorus guttatus</i>	Surmai	++	+++	
			25) <i>Arius thalassinus</i>	Shingala	++	++	

			Siluridae	26) <i>Osteogeniosus militaris</i>	Paroshi	++	++
				27) <i>Plotosus arab</i>	Karim	+	+
				28) <i>Mystus gulio</i>	Shingala	+	+
			Batrachidae	29) <i>Batrachus grunniens</i>	Toad fish	+	+
Pisces	Teleostomi	Acanthopterygii	Gobidae	30) <i>Boleophthalmus boddarti</i>	Nivati	+++	+++
				31) <i>Boleophthalmus dussumieri</i>	Nivati	+++	+++
				32) <i>Gobioides tenuis</i>	Kharbi	++	++
				33) <i>Gobius giuris</i>	Kharbi	++	++
				34) <i>Gobius ocellatus</i>	Kharbi	+	++
			Sciaenidae	35) <i>Sciaena Johnius</i>	Dhoma	++	++
				36) <i>Sciaenoides Johnius</i>	Dhoma	++	++
				37) <i>Otolithoides biauritus</i>	Koth	++	++
			Trachinidae	38) <i>Umbrina russellii</i>	Croakers	+	+
		Squamipinnes	39) <i>Sillago sihama</i>	Renvi	+	++	
		Physostomi	Scopelidae	40) <i>Scatophagus argus</i>	Wara	+	+
			Clupeidae	41) <i>Harpodon nehereus</i>	Bombil	++	++
				42) <i>Coilia dussumieri</i>	Mandeli	++	++
43) <i>Pellona elongata</i>	Katati			++	++		
44) <i>Pellona feligera</i>	Katati			++	++		
45) <i>Escualosa thoracata</i>	Bhiljee	++	++				
Pisces	Teleostomi	Physostomi	Muraenidae	46) <i>Congromuraena anago</i>	Eel	+	++
		Anacanthini	Pleuronectidae	47) <i>Cynoglossus macrolepidotus</i>	Repti	+	++
		Plectognathi	Gymnodontes	48) <i>Chelonodon fluviatili</i>	Kendya	+	++
				49) <i>Tetraodon oblongus</i>	Kendya	+	++
				50) <i>Tetraodon lunaris</i>	Kendya	+	+
				51) <i>Tetraodon stellatus</i>	Kendya	+	++
			Sclerodermi	52) <i>Triacanthus biaculeatus</i>	Triplespines	+	+
		53) <i>Triacanthus strigillifer</i>	Triplespines	+	+		

+++abundant, ++common, + rare.

The table 1 reveals the diversity and density of fish species at Bhayander and Naigaon estuary, 95% of the fishes belongs to class Teleostomi, whereas Elasmobranchii represents only 5%. Among Teleostomi order Acanthopterygii dominates 66% followed by Physostomi 17% and Plectognathi 10% and Anacanthini represents just 2%. Among Elasmobranchii order Laminiformes represents 3% to that of Rajiformes 2%. Study reveals that Family Mugilidae and Scombridae is found to be abundant at Naigaon station, where as they are common at Bhayander station. The food of these fishes mainly comprises of planktons which is abundant in these estuarine waters hence these fishes are found in abundant. Family Gobidae is abundant at both the stations, *Zygaena malleus*, *Rhynchobatus djiddensis*, *Echeneis naucrates*, *Plotosus Arab*, *Mystus gulio*, *Batrachus grunniens*, *Umbrina russellii*, *Scatophagus Argus*, *Tetraodon lunaris*, *Triacanthus biaculeatus*, and *Triacanthus trigillifer* were found to be rare at both the stations.

A total of 36 fish species were recorded from Giriyaampeta Estuary by Bassoucalingam Kumaran *et al.*, (2012). Whereas 112 fish species belonging to 14

orders, 53 families and 80 genera were observed in Ponnani estuary of Kerala by A. Bijukumar and S. Sushama (2000). Also 23 species of fishes were recorded in Manakudy estuary by Johnson and Selva Raj (2008).

In comparison with the results of fish diversity of the above mentioned estuaries, the fish diversity along the estuarine area of Bhayander and Naigaon reveals to be satisfactory. The fish diversity offers a good support to the livelihood of fishermen residing in the adjoining villages by offering a considerable quantity of fish.

This necessitates frequent monitoring of fish diversity and estimation of sustainable yield to ensure steady supply of resources to the local people, though the mangrove forest along the estuarine area of Bhayander and Naigaon is supporting the fish production in the estuary. Apart the mangrove forest ecosystem is under threat due to various anthropogenic activities and it is necessary to take some constructive steps to maintain the mangrove ecosystem that indirectly helps in the maintenance of fish diversity.

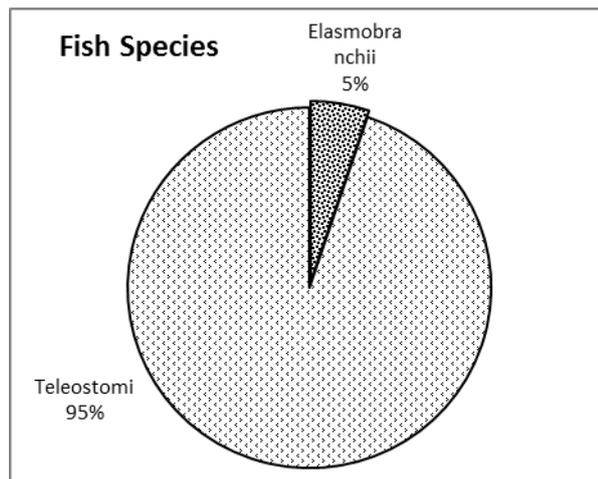


Fig 1: Class Percentagewise distribution of fish species at Station No. 1 and 2 i.e. Bhayander and Naigaon respectively.

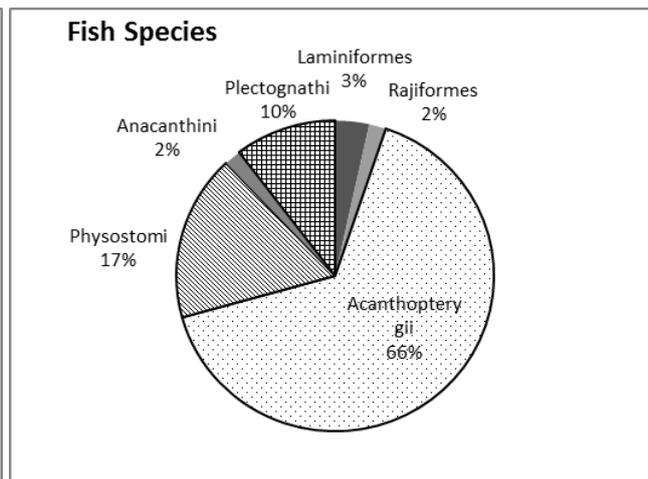


Fig 2: Order Percentagewise distribution of fish species at Station No. 1 and 2 i.e. Bhayander and Naigaon respectively.

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