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Commercially important fin and shell fish catch in Keezhathottam fish landing centre, Tamil Nadu, southeast coast of India

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Abstract

Fishing occupations is one of the most powerful revenue and employment generator of fishing industry. Keezhathottam is one of the minor fish landing centre of Thanjavur district, Tamil Nadu. Small scale fishing practice was carried out in this village using fibre boats. The study was carried out for the period of one year from June 2017 - May 2018. A Total of 62 varieties of commercially important fin and shell fishes are reported, which belongs to 49 genera, 35 families, and 12 orders. Maximum number of 7 species recorded in family Engraulidae followed by Leiognathidae, Portunidae, Penaeidae each represented by 4 species. The anchovy, ponyfish, croaker, sardine, sea bass and shrimps are most common species recorded throughout the year, whereas the overpriced fishes of sea bass (*Lates calcarifer*), silver sillago (*Sillago sihama*) and tiger prawn (*Penaeus monodon*) also found in all the month. Among the 35 families, Engraulidae is the most dominant species. Order Perciformes and Clupeiformes were having more numbers of species compare to others. The low cost fishes such as Leiognathids, Jarbua terapon, Pony fish, flathead, flat fish and catfish are selling for dry fish and poultry farm. Increase of fibre boats after Tsunami 2004 has been dramatically changes income and fishing methods in Keezhathottam village. Inferences of the present study indicates the abundance of commercially expensive and low value fishes in small scale fishery industry in Palk Bay ecosystem in Keezhathottam village. The present study also showed the overall percentage composition of shell and fin fish catch, variations in species richness. The small scale fishery in Keezhathottam is in flourishing stage with high fin and shell fish catch. Good fishing practices needs to be followed to sustain the resources for a longterm.

Keywords: sustainable fishing, fish diversity, sea bass, palkbay, seagrass ecosystem, small scale fishery

1. Introduction

The marine environment is a complex ecosystem with broad assemblage of diverse fauna and flora. India blessed with rich diverse marine communities of around 7516.6 km coastline with a unique feature of coastal states, union territory and islands. Tamil Nadu is the southern part of the Indian peninsula, the third longest coastline states of India. It has two major and wealthy places, namely Palk Bay and Gulf of Mannar. Palk Bay is located on the central coast of Tamil Nadu, it spreads across five revenue districts; a large number of people are dependent on the coastal and marine ecosystems and their resources for survival and livelihood. In India, totaly 1, 94,490 fishing crafts operated, among this 72,500 are mechanized crafts, 71,300 are motorized crafts rest of them are non - mechanized crafts^[1]. In Tamil Nadu 6700 mechanized crafts and 54,163 traditional crafts are being operated^[18]. In entire Palk Bay coast, more than 6000 mechanized and non-mechanized boats were involved for active and passive fishing through sustainable and unsustainable fishing practices.

In India, the fishing industry plays an important role in export business. The commercial fish fauna of India has been studied extensively^[11, 12], the marine fishery industries have been experiencing threats by the way of unsustainable fishing practices. The mechanized trawler fishing is one of the destructive fishing methods^[14]. Usually bottom trawl nets are used to catch bottom dwelling fishes and shrimps up to 6,000 feet depth^[15]. A large number of people in major coastal states of India involved in the oldest profession of small scale fishing practice^[4]. The basic idea of sustainable fishery is that the fishes should be harvested without affecting the ecosystem in appropriate fishing method. In Palk Bay, trawl net and "small boat sail trawl nets operations are causing major impacts on benthic habitats including seagrass and coral reef

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ecosystems.

Palk bay is a highly productive coastline in southeast coast of India due to its shallow, enclosed geography; there are 14 species of seagrasses identified in this region^[13]. Naturally, it serves as a breeding and feeding ground for many fishes, molluscs, mammals and many other invertebrate species. Since 1960 Keezhathottam fishing village operating more sustainable fishing practices, support of small craft and simple gear with good understanding of the coastal systems and resources, which is passed on from one generation to another generation; mainly the fishing activity is not exceeding 20 km with very few motor boats and mostly wooden sail boats.

The sustainable fishing can increase the fishery population without disturbing the habitat. In regular basis, over 250 fisherman are operating more than 70 FRP vessels for crabs, shrimps and other commercially valuable fin fishes such as sea bass and halfbeak fishes. The Present paper deals with the pattern of small scale fishery activities in this village, located in northern Palk Bay.

2. Materials and Methods

2.1 Description of the study area

Study area is situated on the coast of Thanjavur district, in

northern Palk Bay. Keezhalthootam fish landing centre is one of the important minor fish landing sites (Lat. 11° 21'32N; Long. 79° 50'24E) for small scale fishery. A three hour busy fish auctions performed every day at the fish landing centre of Keezhathottam for local cycle vendors and commission agents. The higher fishery productivity and good fish catch in this region throughout the year is due to mangroves and seagrass beds that serve as a nursery ground for variety of fin and shell fishes in northern Palk Bay (Fig.1).

2.2 Sample collection

To carry out the inventory of the finfish and shell fish resources of this region, the specimen collections was performed from small FRB vessels on a twice a week s for the period of one year. All the data were pooled monthly for data analysis. The fishing vessels were operated over 20 km distance at a depth range of 5 - 20 feet. The specimens were collected randomly from each heaps during the auctions time. All collected specimens were brought to the laboratory, washed thoroughly with tap water and cleaned with brush to store in formalin for further investigation. The preserved specimens were identified using appropriate literature^[16, 8].



Fig 1: Showing the fish landing centre of Keezhathottam fishing village

3. Results

A total number of 62 species of fishes from 35 different families with four different classes were recorded. Maximum numbers of species were recorded from the family Engraulidae, followed by Leiognathidae, Portunidae, Penaeidae (Fig.2). Order Perciformes have large number of families followed by Clupeiformes and decapods showed in Table 1. High commercially valuable shell fishes and fin fishes were recorded during this study by small scale fishery at Keezhathottam. The *Lates calcarifer* is commonly called as

Seabass and a single specimen harvested was weighed average size in all the months. Approximately about 25 huge sized (8 – 10 kilo gram) sea bass were caught by Keezhathottam fishers in over the study periods, which were sold rupees 2500 to 4500, This small scale fishing practice of Pajhathottam provides the export quality fishes such as *Sillago sihama* and crustacean like *Penaeus monodon*, *P. semisulcatus*, *Scylla serrata* and *Portunus pelagicus*, which are also selling in auctions for higher prices based on the size and demands.

Table 1: Fin and shell fish resources collected in small scale fishery at Keezhathottam fish landing centre

Group	Scientific name	Common Name	Vernacular Name	Months											
				Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18
Fishes	<i>Liza vaigiensis</i>	Squairetail mullet	கெண்டை மீன்	+	+	+	-	+	-	+	+	+	+	-	-
	<i>Scatophagus argus</i>	Spotted scat	லத்தி மீன்	+	-	+	-	-	+	+	-	+	-	+	+
	<i>Alectis ciliaris</i>	African pompano	சேவண்டிப் பார	+	-	-	-	+	-	-	-	+	-	-	+
	<i>Leiognathus brevisrostris</i>	Shortnose ponyfish	தட்டை கார	+	+	+	+	+	+	+	+	+	+	+	+
	<i>Sphyraena obtusata</i>	Obtuse barracuda	ஊழி மீன்	+	-	-	-	-	-	-	+	-	+	-	+
	<i>Secutor insidiator</i>	Pugnose ponyfish	செவட்டு கார மீன்	+	-	+	+	+	+	-	+	+	+	-	+
	<i>Siganus javus</i>	Streaked spinefoot	சல்லை ஓரா மீன்	+	+	-	-	+	-	+	-	+	-	+	+
	<i>Sillago sihama</i>	Silver sillago	கிழக்கன் மீன்	+	+	+	+	+	+	+	+	+	+	+	+
	<i>Panna microdon</i>	Panna croaker	பண்ணா மீன்	+	+	+	+	+	+	+	+	+	+	+	+
	<i>Lates calcarifer</i>	Seabass	கொடுவா கண்ணு	+	+	+	+	+	+	+	+	+	+	+	+
	<i>Setipinna taty</i>	Scaly hairfin anchovy	மீசை தோலி	+	-	-	+	+	-	-	+	-	+	-	-
	<i>Drepane punctata</i>	Spotted sicklefish	பசந்தி மீன்	+	+	+	+	+	+	+	+	+	+	+	+
	<i>Hemiramphus far</i>	Black-barred halfbeak	புள்ள முரல் மீன்	+	+	+	+	+	+	+	+	+	+	+	+
	<i>Gerres filamentosus</i>	Whipfin silver-biddy	ஊடகம் மீன்	+	+	+	+	+	-	-	-	+	+	-	-
	<i>Terapon jarbua</i>	Jarbua terapon	கீலி மீன்	+	-	+	+	+	+	+	+	+	+	-	+
	<i>Sardinella gibbosa</i>	Goldstripe sardinella	கொய் மீன்	+	+	+	+	-	-	+	+	+	+	+	-
	<i>Dussumieria acuta</i>	Rainbow sardine	தொண்டான் மீன்	+	+	-	-	+	+	+	+	-	+	-	+
	<i>Coilia dussumieri</i>	Goldspotted grenadier anchovy	தோவை மீன்	+	+	+	+	+	+	+	+	+	+	+	+
	<i>Stolephorus indicus</i>	Indian anchovy	நெத்திலி மீன்	+	+	+	+	+	+	+	-	+	+	+	-
	<i>Stolephorus commersonnii</i>	Commerson's anchovy	நெத்திலி மீன்	+	+	-	+	+	+	-	+	+	+	-	+
	<i>Thyssa mystax</i>	Moustached thryssa	பொருவா	+	+	+	+	-	+	-	+	-	+	+	+
	<i>Thyssa setirostris</i>	Longjaw Thyssa	தாடி பொருவா	+	+	+	+	+	+	+	+	+	-	+	+
	<i>Escualosa thoracata</i>	White Sardine	தேசை பொடி	+	+	+	+	+	+	+	+	+	+	+	+
	<i>Mugil cephalus</i>	Grey mullet	மடவா கெண்டை	+	+	+	+	+	-	+	+	+	+	+	+
	<i>Encrasicholina punctifer</i>	Buccaneer anchovy	நெத்திலி மீன்	+	-	-	+	-	+	-	-	+	-	+	-
	<i>Etroplus suratensis</i>	Pearl spot	செத்தில் மீன்	+	+	+	-	-	+	+	+	+	-	+	+
	<i>Psammoperca waigiensis</i>	Waigieu seaperch	செங்கனி மீன்	+	+	-	-	-	+	+	-	+	-	+	+
	<i>Siganus canaliculatus</i>	White-spotted spine foot	வெள்ள ஓரா	+	-	-	-	+	-	-	+	-	-	+	+
	<i>Parastromateus niger</i>	Black pomfret	கரு வாவல் மீன்	+	+	-	-	+	-	+	-	+	-	+	-
	<i>Pampus argenteus</i>	Silver pomfret	வெள்ளை வாவல்	+	-	-	+	+	+	-	+	-	+	-	+
	<i>Pampus chinensis</i>	Chinese silver pomfret	வாவல் மீன்	+	-	-	+	-	+	-	+	+	-	+	-
	<i>Trichiurus lepturus</i>	Largehead hairtail	சுண்ணாம்பு வாவல்	+	-	+	-	-	+	-	-	-	+	-	+
	<i>Sardinella gibbosa</i>	Goldstripe sardinella	சாலைமீன்	+	+	-	-	+	-	+	+	-	+	-	+
	<i>Dussumieria spp.</i>	Rainbow sardine	கவளை மீன்	-	-	-	+	-	-	-	-	-	-	-	-

	<i>Ilisha megaloptera</i>	Bigeye ilisha	தொண்டன் மீன்	+	+	-	-	-	-	-	-	-	-	-	-
	<i>Leiognathus bindus</i>	Orangefinned Ponyfish	செவட்டு கார	+	+	+	+	+	+	+	+	+	+	+	+
	<i>Leiognathus blochii</i>	Ponyfish	கார பொடி	+	+	+	+	+	+	+	+	+	+	+	+
	<i>Platycephalus indicus</i>	Bartail flathead	கல்லு வெட்டி	+	+	+	+	+	+	+	+	+	+	+	+
	<i>Pomadasys maculatus</i>	Saddle Grunt	கீச்சான் மீன்	+	-	-	+	+	+	-	-	+	+	+	+
	<i>Himantura marginata</i>	Black edge whip ray	மணி திருக்கை	+	+	-	-	+	-	-	+	-	+	-	+
	<i>Narcine brunnea</i>	Brown numbfish	மணல் திருக்கை	+	-	+	-	-	+	+	-	-	-	+	-
	<i>Himantura imbricata</i>	Scaly whipray	முள் திருக்கை	+	-	+	-	-	-	-	+	-	+	+	+
	<i>Arius spp.</i>	Threadfin Sea Catfish	கள்ள கெளுத்தி	+	-	+	-	+	+	+	-	+	-	+	-
	<i>Plotosus canius</i>	Gray eel-catfish	கெளுத்தி மீன்	+	+	+	+	+	-	+	+	+	+	+	+
	<i>Plotosus limbatus</i>	Darkfin Eel Catfish	மனவா கேளுறு	+	+	-	+	-	-	+	-	+	-	+	+
	<i>Chiloscyllium indicum</i>	Slender bambooshark	கொரக்கன் சுறா	-	-	-	-	-	-	-	-	+	+	+	-
	<i>Cynoglossus arel</i>	Smallscale	அரள் மீன்	+	-	-	+	+	+	+	+	+	+	+	-
	<i>Pseudorhombus micrognathus</i>	Norman's flounder	குறிச்சா மீன்	+	+	+	-	+	+	-	+	+	-	+	+
	<i>Synaptura albomaculata</i>	Kaup's sole	அரள்	-	+	-	-	+	-	-	-	+	-	+	+
	<i>Pseudorhombus javanicus</i>	Darkfin Eel Catfish	குறிச்சா மீன்	-	-	-	-	-	-	-	-	+	-	-	-
	<i>Pseudorhombus triocellatus</i>	Threespot Flounder	புள்ளி குறிச்சா	+	+	+	+	-	+	-	+	-	+	+	-
Mollusc	<i>Sepioteuthis lessoniana</i>	Bigfin reef squid	கூந்தல் கணவாய்	+	-	+	-	+	+	-	+	-	+	+	+
	<i>Sepia pharaonis</i>	Pharaoh Cuttlefish	ஓட்டு கணவாய்	+	-	-	-	-	+	-	+	-	-	+	-
Crabs	<i>Charybdis feriata</i>	Crucifix crab	சிலுவை நண்டு	+	-	-	-	-	+	-	-	-	-	+	-
	<i>Portunus (Portunus) sanguinolentus</i>	Threespot swimming crab	முக்கண் நண்டு	+	+	-	-	+	+	+	-	+	-	+	+
	<i>Portunus pelagicus</i>	Flower crab	நெடுங்கால் நண்டு	+	+	+	+	+	+	+	+	+	-	-	+
	<i>Scylla serrata</i>	Mud crab	கல் நண்டு	-	-	+	+	-	-	+	+	-	+	+	-
Shrimps	<i>Metapenaeus affinis</i>	Jinga shrimp	கருக்காடி இறால்	+	+	+	+	+	-	-	+	-	+	-	+
	<i>Penaeus semisulcatus</i>	Green tiger prawn	தாழை இறால்	+	+	+	+	+	+	+	+	+	-	+	-
	<i>Penaeus monodon</i>	Tiger prawn	கருவண்டு இறால்	+	+	+	+	-	+	-	+	+	+	+	-
	<i>Penaeus indicus</i>	Indian prawn	வெள்ளை இறால்	+	+	+	+	+	-	+	+	+	+	+	-
Lobsters	<i>Panulirus homarus</i>	Scalloped spiny lobster	சிங்கி இறால்	+	-	+	-	-	-	-	-	-	-	+	-

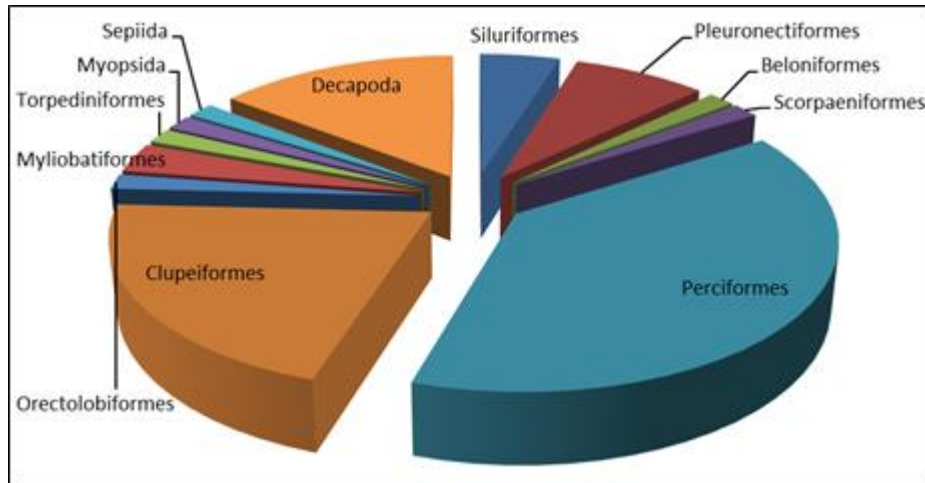


Fig 2: Overall percentage composition fin and shell fishes of Keezhathottam landing centre

The results of the multivariate analysis of 9 different groups of fin and shell fish resources throughout the period of one year, showed the highest species richness in June, lowest species richness in December. The quantity of fish catch was also higher in June than any other months (Fig.3a). The study observed a seasonal pattern of changes in fish catch diversity.

It was higher in summer and premonsoon seasons, and lesser in monsoon (Fig.3b). Whereas, highest number of groups such as fishes, mollusc, crabs, shrimps, lobsters (*Panulirus homarus*) recorded in March, lowest in September (Fig.4a), in season wise contribution summer was high and the lowest number of groups recorded in monsoon (Fig. 4b).

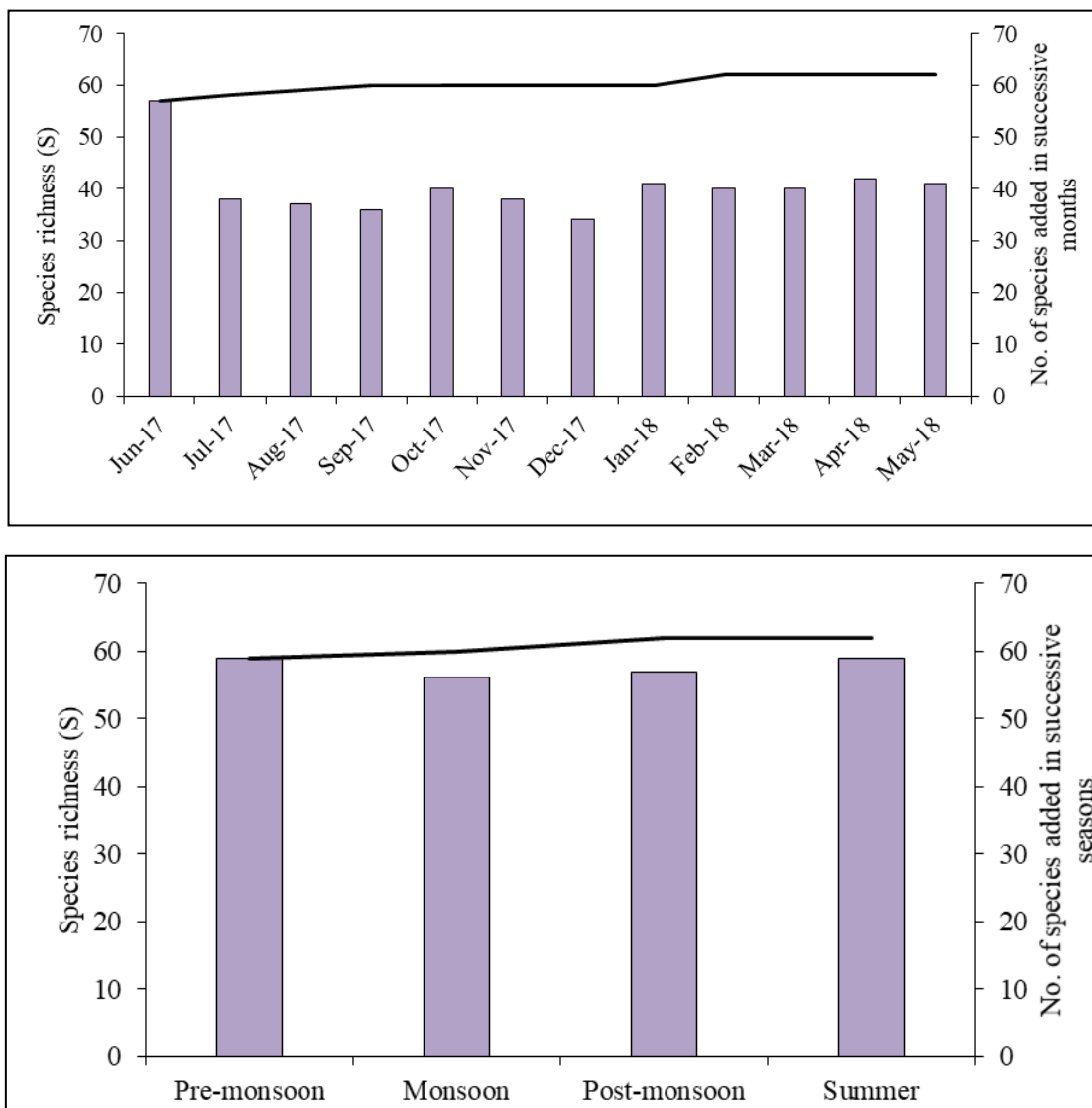


Fig 3: a & b) Month and season wise species richness in different groups of species population

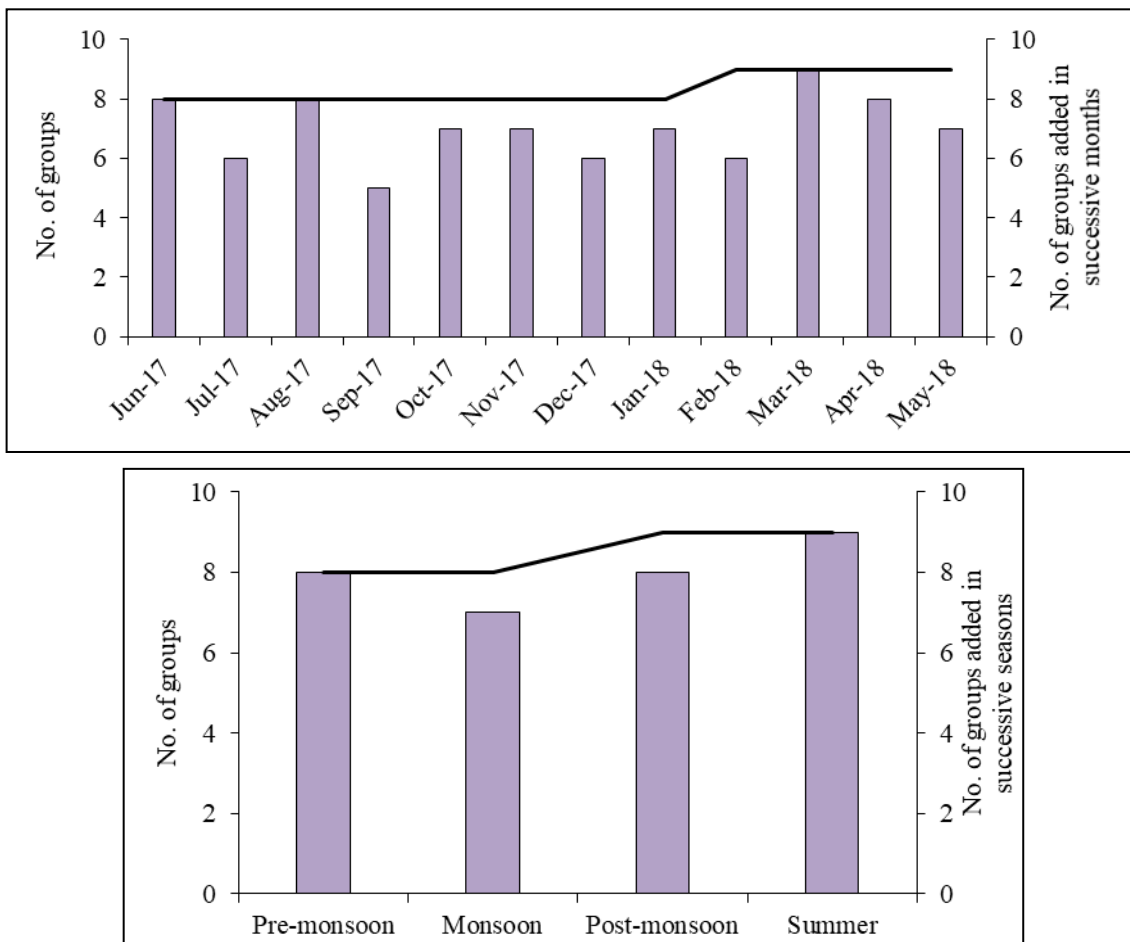


Fig 4: a & b) Month and seasonally group wise composition of fin and shell fishes

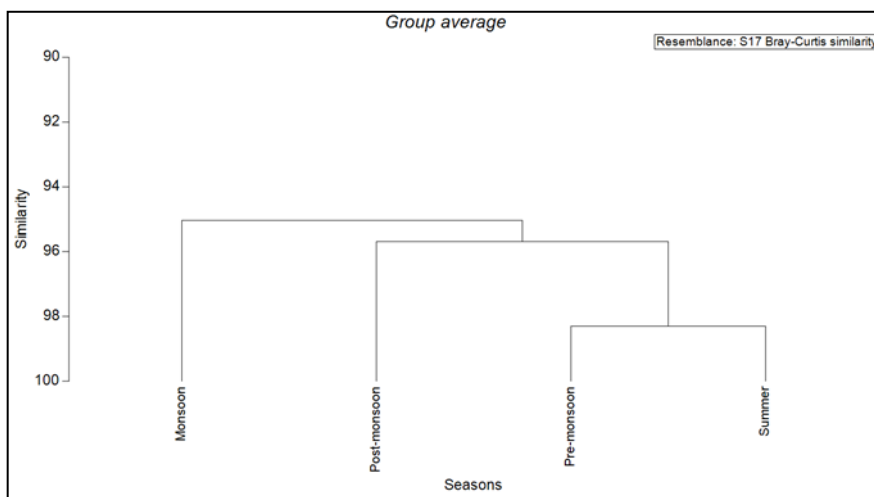


Fig 5: Showing cluster analysis of species assemblage between the season

The cluster analysis fig. 5 indicated the similarity between the season with three major clades of four different seasons, the summer and pre monsoon season was linked with 98 % similarity level. The post monsoon linked in pre monsoon at 96 % similarity level. The monsoon was season joined with the post monsoon at 95% similarity level. Each season clearly indicates the species population in all the groups.

4. Discussion

India is one of the mega biodiversity countries in terms of biological diversity, whereas it is rich in diversity of fishes and other organisms. The variation in ecosystems, habitats and fish diverstiy depends on geographical position,

ecological conditions [19]. A costal and offshore of India are reported over 1370 important fish species estimated [2]. According to the fishery statistics more than 100,000 fishing vessels are regularly operated in India. The traditional fishing crafts and gears are regulating the fishery population sustainably. In general small-scale fisheries employ a wide variety of gear types, which vary in the way they interact with marine ecosystems [15]. The impact of fishing is classified mainly by mechanized and non- mechanized. Some of the artisanal fishing gear like lobster traps, fish traps, set gillnets, and drift gillnets also impacts the marine ecosystem and benthic habitats [9]. In the present study area, all fishing practices are based on small scale fishery. Total number of

crafts used here is enumerated as 70 numbers of FRB boats and 10 numbers of dugout canoes. The main gears employed for fishing here are shore seines, gill net nets and, hook lines. Around 250 peoples directly involved in the fishing activities through small scale fishing methods. The distance of the gear operation was ranged between 3 km to 20 km distance. This small scale fishery harvest good yields within short duration. A small group of tribal fishing communities are catching shrimps and crabs by hand in shallow mangroves and shallow waters of Keezhathottam. The present study showed 62 species belongs to five majors groups namely fishes, mollusc, crabs and shrimps. In family wise contribution of fin fishes, Engraulidae was contributing the maximum species followed by Leiognathidae, Portunidae, Penaeidae (Table 2).

Tamil Nadu has the second largest number of trawlers when compared to other states of India, showing unsustainable fishing pattern [6]. The over exploitation of fishery resources by trawl net operation affects the small scale fishing communities like Keezhathottam, who mostly catch fishes in near shore waters. Commercial fishing operations in relation with the fishing of the very near shore operation and also faced some unique problems to the fishery managers [5].

The results of the present study showed that there is an increase of fish catch in near shore waters by small scale fishers during summer and premonsoon (from April to June months), which is during and after the the fishing ban season for trawlers. So, the trawler fishing ban may increase the fishery productivity of the local marine ecosystem, which results in higher fish catch by small scale fishers of Keezhathottam. So, Number of groups and species of fishes caught in Keezhathottam were higher in June than any other months.

The reason for higher fishery productivity Keezhathottam and other northern Palk Bay villages may be due to southwest monsoon and southerly water currents in Palk Bay during this month. This natural phenomena may brought the marine organisms including fin and shell fishes along with currents towards the corner of northern Palk Bay, where the Keezhathottam fishers actually harvest high yields in June.

The results of the multivariate analysis of all groups of fin and shell fishes throughout the study period also indicated that the highest species richness in June, whereas lowest species richness in December. The seagrass ecosystem spreads along the shoreline of Palk Bay for about 120 km, and Thanajvur District has 12,247 hectares of seagrasses [3], which serve as a nursery ground for the production of a variety of crabs, shrimps, squids and other commercially valuable fishes.

However, the small scale fishery generally facing serious threats by man made activities in Palk Bay in recent decades. A study stated that 30 % of the seagrass has been lost in Asian region in the last thirty years [17]. In Keezhathottam fishing village the seagrass spread up to 7 kilometer distance from the shore. As per the 1980's fisherman interviews, the fish and crustaceans were abundant in this region, which has been slowly decreased in the last 38 years due to unsustainable fishing methods.

Seagrass and mangroves are highly productive ecosystems for

fish and other invertebrates, both ecosystems are major habitats for small scale fishing practices in Palk Bay. In Keezhathottam coastal area is located exactly between Muthupettai mangrove ecosystem and seagrass ecosystem in northern Palk Bay, which may also another reason for high fishery yields harvested by small scale fishers in Keezhathottam.

The study revealed that the the assorted fishes of *Leiognathus* sp., *Stolephorus* sp., *Ilsha* sp., and *Plotosus* sp are selling to very low cost, the silver bellies captured in large quantity at Keezhathottam and sold for very low price in local market. A subsequent trails results showed that about 450 kg of fishes mostly leognathids caught per hour of trawling, which are of very little commercial value and used mainly for fish meal [7].

Keezhathottam fishers were used only wooden sailing boats about 20 years ago. The number of fibre boats greatly increased after Tsunami 2004, when the Keezhathottam fishers bought second hand boats from Tsunami affected districts in Coramandal coast. The international donors donated large number of boats after Tsunami to Cuddalore and Nagappattinam Districts, which were more than the carrying capacity of the coastal ecosystem. So, each fisherman received more than one boat to their family, which was later sold out for second hand to Palk Bay villages. So, number of boats in Keezhathottam and fishing efficiency was greatly increased in the next few years in Keezhathottam and other villages of Palk Bay, as an man made impact after Tsunami 2004. The profit is more in small scale fishery, when compared to the trawl fishery expenses due to expenditure for fuel, manpower and vessel management.

The catch effort was more in small scale fishery, while comparing to the trawl fishery expenses, the economic losses and other expenditures of fishing operations [10]. The cluster analysis was clearly indicates the similarity between species assemblage between seasons, the results showed in four groups. These formed a group to which the monsoon and post monsoon joined with summer and pre monsoon at a similarity level of around 95%. In both seasons glade joined at 98% similarity level. In most instances, a particular season of both seasons fused with the same glades (Fig.5.). Present study area more than 70 motorized fishing boats are involved for boat seines operation with minimum 4 to 7 hours. Most of the people stating their fishing activities in early morning at 3 AM, a quick operation the captured fishes were brought to the landing centre at 8 Am. Total auction time was calculated only two hours, around 15 cycle and 10 women vendors are purchased. Every day 50000 to 75000 rupees turned over within the 2 hours of auction. Within these short hours every boat earns good income. Apart from this small scale boat fishing, about 20 to 30 tribal peoples are involved in traditional handpicking of shrimps during low tide periods. Around 5 to 10 peoples are using hook lines and mud crab fishery in nearby mangrove areas of Keezhathottam. Only selective boats are operated catching shrimps, and each boat catches about 10 to 20 kg of *Penaeus monodon* and *P. semisulcatus* in marketable size.

Table 2

Phylum	Class	Order	Family	No. Sp	%
Chordata	Actinopterygii	Siluriformes	Ariidae	1	1.6
			Plotosidae	2	3.2
		Pleuronectiformes	Cynoglossidae	1	1.6
			Paralichthyidae	3	4.8

			Soleidae	1	1.6
		Beloniformes	Hemiramphidae	1	1.6
		Scorpaeniformes	Platycephalidae	1	1.6
		Perciformes	Scatophagidae	1	1.6
			Sciaenidae	1	1.6
			Siganidae	2	3.2
			Sillaginidae	1	1.6
			Sphyraenidae	1	1.6
			Stromateidae	2	3.2
			Terapontidae	1	1.6
			Trichiuridae	1	1.6
			Carangidae	2	3.2
			Cichlidae	1	1.6
			Drepaneidae	1	1.6
			Gerreidae	1	1.6
			Haemulidae	1	1.6
			Latidae	2	3.2
			Leiognathidae	4	6.5
			Mugilidae	2	3.2
		Clupeiformes	Clupeidae	3	4.8
			Dussumieriidae	2	3.2
			Engraulidae	7	11.3
			Pristigasteridae	1	1.6
	Elasmobranchii	Orectolobiformes	Hemiscylliidae	1	1.6
		Myliobatiformes	Dasyatidae	2	3.2
		Torpediniformes	Narcinidae	1	1.6
Mollusca	Cephalopoda	Myopsida	Loliginidae	1	1.6
		Sepiida	Sepiidae	1	1.6
Arthropoda	Malacostraca	Decapoda	Portunidae	4	6.5
			Penaeidae	4	6.5
			Palinuridae	1	1.6

5. Conclusion

Present study highlight the diversity of commercially important fishes of Keezhathottam landing centre and the population, general incomes for associate fishing community, majority of the results indicate the presence of seagrass associated fisheries. The number of boats increased after Tsunami in 2004 at Keezhathoddam and other villages of Palk Bay. This study concludes that the small scale fisheries in Keezhathoddam village are earning high income, which is in flourishing stage with high fin and shell fish catch. The impact of small scale fishery is less, when compare to trawlers. However, good fishing practices such as controlling number of boats, mesh size needs to be followed to sustain the resources for longterm.

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