

## ORIGINAL RESEARCH ARTICLE

## Fish Resources in Mallipattinam Coast, South East Coast of India

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Received 14 May 2012; Revised 11 Aug 2012; Accepted 20 Aug 2012

**ABSTRACT**

Coastal area is dependent upon fishing and related activities and their economies have been badly damaged by the overfishing of fishery resources at an ever increasing rate over the past decade. Fishery resources are finite but renewable. If placed under sound management before overfishing has caused irreversible effects, the fisheries can be conserved and maintained so as to provide optimum yields on a continuing basis. Totally 66 species belonging to 31 families and 39 genera were recorded. A different family fishes such as Aridae(1), Carangidae(6), Centropomidae(1), Channidae(1), Chirocentridae(1), Cyglossidae(1), Clupeidae(3), Drepaneidae(1), Engraulidae (7), Exocoetidae(3), Gerreidae(1), Hemiramphidae(1), Leiognathidae(2), Lutjanidae(5), Mugilidae(1), Mullidae(3), Pristigasteridae(2), Psettodidae(1), Platycephalidae(1), Plotosidae(1), Scaridae(1), Scombridae(3), Serranidae(4), Sillaginidae(3), Sphyraenidae (3), Stromateidae (2), Sciaenidae (1), Serranidae (2), Teraponidae (1), Triacanthidae (1), Trichiuridae (2) observed in the landings.

**Key words:** Fishes, exploitation, resources and planning.

**INTRODUCTION**

The marine fishery resource is a self renewable living natural resource in a dynamic habitat. It is obligatory on the part of the country to utilize this resource to the optimum level for the benefit of the people<sup>[1,2]</sup>. Fishes has always been a primary source of food for coastal populations and remains so today despite the difficulties the sector is facing<sup>[3]</sup>. India is rich in natural resources and the annual harvestable fishery potential of the country is estimated to be millions of tones day by day increased<sup>[4,5]</sup>. It is established that the fish biodiversity of the country is diminishing at an alarming rate in all the aquatic zones<sup>[6]</sup>. The marine fisheries are mainly exploited by traditional and small scale fishing vessels operating in the coastal waters. Exploitation of fishery resources over the years has gradually progressed from under exploitation to moderate exploitation and finally to overexploitation<sup>[5,7,8]</sup>. Environmental factors are closely linked to the cause and causes of disease and the associated production losses<sup>[9]</sup>. Among the exploited marine fish resources of country is essential to improve the population of the respective areas<sup>[10, 11, 12]</sup>. Hence in the present study an attempt has been

made to identify the marine fishes from Mallipattinam coast.

**MATERIALS AND METHODS**

The present study was carried out for one year from January 2009 to December 2009 from Mallipattinam (10<sup>0</sup> 16' 35N"; 79<sup>0</sup> 19' 12" E), south east coast of India. Seasonal samples were collected by watching the fishing sites, landing centres and markets. After collection, the fishes were stored in ice boxes and fixed 10% buffered formalin. Later the specimens were examined the different morphological character for identified with help of standard references<sup>[13, 14, 15]</sup>. The methodology for the above study is carried out by following the method<sup>[5]</sup>.

**RESULTS AND DISCUSSION**

In the present study family Ariidae was represented by under the 1 genus (*Arius*) 1 species *Arius arius*, the family Carangidae was represented by under the 5 genera (*Caranx*, *Alectis*, *Alepes*, *Scomberoides* and *Trachinotus*) 6 species *C. sem*, *A. indicus*, *A.ciliaris*, *Alepes sp*, *S. tol*, *T. blochii*, Centropomidae was represented by under the 1 genus ( *Lates*) 1species *L.calcarifer*, Channidae

was represented by under the 1genus (*Chanos*) 1species

*C. chanos*, Chirocentridae was represented by under the 1genus (*Chirocentrus*) 1species *C. dorab*, Cynoglossidae (Tonguefishes) was represented by under the 1genus (*Cynoglossus*) 1species of *C. arel*, Clupeidae was represented by under the 1 genus (*Sardinella*) 3 species of *S. longiceps* (Oil sardine), *S.fimbriata*, *S. gibbosa*. The family Drepaneidae was represented by under the 1genus (*Drepane*) 1species *D. punctata* (Spotted sicklefish), Engraulidae was represented by under the 2 genera (*Thryssa* and *Stolephorus*) 7 species *T. malabarica* *T.dussumieri* *T.malabarica* *T. purava* (Oblique-jaw), *S. indicus* (Indian anchovy), *S.commersoii*, *S.insularis*, Exocoetidae was represented by under the 3 genera (*Cheilopogon* *Exocoetus* and *Cypselurus*) 3 species *C. spilopterus* (Spotfin flyingfish), *E. volitans* (Tropical two-wing), *Cypselurus sp*, Gerreidae was represented by under the 1 genus(*Gerres*) 1species *G. abbreviates* (Silver-Biddy), Hemiramphidae was represented by under the 1 genus (*Hemiramphus*) 1species *H. far* (spotted halfbeak), Leiognathidae was represented by under the 2 genera (*Gazza* and *Leiognathus*) 2 species *G. inuta*, *Leiognathus sp*, Lutjanidae was represented by under the 1genus (*Lutjanus*) 5 species *L. argentimaculatus* (Mangrove Red Snapper), *L.malabaricus* (Malabar blood snapper), *L.lutjanus* (Big eye snapper), *L.rivulatus* (Maori Snapper) *L.fulviflamma* (Dory snapper). The Mugilidae was represented by under the 1genus (*Mugil*) 1species *M. cephalus* (striped mullet), Mullidae was represented by under the 1genus (*Upeneus*) 3 species *U. sulphureus* (Goat fishes), *U.bensasi*, *U.vittatus*, Pristigasteridae was represented by under the 1genus (*Ilisha*) 2 species *I. elongate*, *I.kampen*, Psettodidae was represented by under the 1genus (*Psettodes*) 1species *P. erumei*, Platycephalidae was represented by under the 1genus (*Platycephalus*) 1species *P. indicus* (bartail flathead), Plotosidae was represented by under the 1genus(*Plotosus*) 1species *P. canius* (Black eeltail catfishes), Scaridae was represented by under the 1genus(*Scarus*) 1species *S.gobban*, Scombridae was represented by under the 3 genera (*Rasterigella*, *Auxis* and *Scomberomorus*) 3 species *R. kanagurta* (Indian mackerel), *Auxis sp*, *Scomberomorus sp*. The family Serranidae was represented by under the 1genus(*Epinephelus*) 4 species *E. tauvina* (Greasy grouper), *E.bleekeri*, *E. malabarica*

(Malabar grouper), *E.hexagonatus*, Sillaginidae was represented by under the 1genus (*Sillago*) 3 species *S. sihama* (Indian Sand Whiting), *S.aeolus*, *S.ingenuea*, Sphyraenidae was represented by under the 1genus (*Sphyraena*) 3 species *S. barracuda*, *S. forsteri*, *S.jello*, Stromateidae(Butterfishes) was represented by under the 1genus (*Pampus*) 2 species *P. argenteus* (Silver pomfrets), *P. chinensis* (Chinese silver pomfrets), Sciaenidae was represented by under the 1genus(*Johnius*) 1species *Johnius sp*, Serranidae was represented by under the 1genus (*Epinephelus*) 2 species *E. diacanthus* (Spinycheek grouper), *E. lanceolatus* (Brindle Bass), Teraponidae was represented by under the 1genus (*Terapon*) 1species *T. puta* (Small-scaled terapon), Triacanthidae was represented by under the 1genus (*Triacanthus*) 1species *T. biacculeatus* (Short-nosed tripodfish), Trichiuridae was represented by under the 2 genera (*Trichiurus* and *Lepturacanthus*) 2 species *T. lepturus* (largehead hairtail), *L. savala* (**Table 1**).

The fish constitutes the most important part of the diet of many people. Fishing has been carried out since ages and human beings have developed various gadgets and technologies for catching all varieties of fish from all regions and masses of water, at all depths as well as in large quantities to take care of the ever increasing population and demands. India's marine capture fish production, increased from 520,000 tonnes in 1950 to 3.15 million tonnes in 2007. The bulk of the catch comprises oil sardines, followed by Indian mackerel, Bombay duck, croakers, cephalopods, other sardines and threadfin breams <sup>[16]</sup>. The fishery resources due to over exploitation, facing the depletion problem <sup>[17]</sup>. To meet the demands for the food security the effort for high catching has been increased. <sup>[18]</sup> estimated the challenges and opportunities of marine capture fisheries India. A similar aspect agrees with <sup>[19,20]</sup> discussed the problems of fishing and challenging the fisheries development in India. The unreported fishing contributes to overexploitation of fish stocks and is a hindrance to the recovery of fish populations and ecosystems <sup>[21]</sup>. It is widely accepted that there is a severe problem with future global food security. The marine fish landings along the Indian coast consisting of 53 exploited species and groups were estimated for the period 1950-2002 <sup>[22]</sup>. The subsistence fishing is common, the catching of fish to eat rather than to sell results in a total catch that is often several

times larger than that from commercial fishing. It is a renewable resource that is not produced but extensively harvested, as a rule, freely harvested<sup>[22]</sup>. The use of natural marine resources such as the coastal vegetation or mangroves or the harvesting of fish requires careful control to avoid overexploitation<sup>[5]</sup>.

The number of estimated living fish species might be close to 28,000 in the world. Marine fishes along Indian coast previously reported 569 species<sup>[23]</sup>,<sup>[24]</sup> recorded 68 species,<sup>[25]</sup> recorded 32 clupeid fishes in Parangipettai waters. The Lakshadweep islands have a total of 603 species of fishes<sup>[26]</sup>.<sup>[27]</sup> commercial sea fishes of 548 species belonging to 88 families were recorded,<sup>[28]</sup> were recorded 50 species in Visakhapatnam and<sup>[26]</sup> 62 flatfishes were recorded.<sup>[30]</sup> has described 1418 species of fish under 342 genera from the British India.<sup>[31]</sup> has described 2546 species of fish belonging to 969 genera, 254 families and 40 orders.<sup>[32]</sup> were recorded 197 species belonging to 68 families in Pichavaram mangroves. Over 1000 species are found in the Andaman and Nicobar Islands and about 358 in the Gulf of Mannar Biosphere Reserve. The category of fishes occurring in coral reef ecosystem of India includes groups such as the damselfishes (52), angelfishes (16), parrot fishes (14 species), snappers (42 species) and surgeonfish (18 species)<sup>[33]</sup>. Another 20% are composed of cryptic and nocturnal species that are confined primarily to caverns and reef crevices during daylight periods<sup>[34]</sup>. 37 Tetraodont fishes belonging to 8 families coming under 26 genera were recorded by<sup>[35]</sup>. In the present study family Ariidae representing was 1 genus and 1 species, Carangidae representing was 5 genera and 6 species, Centropomidae representing was 1 genus and 1 species, Channidae representing was 1 genus and 1 species, Chirocentridae representing was 1 genus and 1 species, Cynoglossidae representing was 1 genus and 1 species, Clupeidae representing was 1 genus and 3 species, Drepaneidae was representing 1 genus and 1 species, Engraulidae representing was 2 genera and 7 species, Exocoetidae representing was 3 genera and 3 species, Gerreidae representing was 1 genus and 1 species, Hemiramphidae representing was 1 genus and 1 species, Leiognathidae representing was 2 genera and 2 species, Lutjanidae representing was 1 genus and 5 species, Mugilidae representing was 1 genus and 1 species, Mullidae representing was 1 genus and 3 species, Pristigasteridae representing was 1 genus and 2

species, Psettodidae representing was 1 genus and 1 species, Platycephalidae representing was 1 genus and 1 species, Plotosidae representing was 1 genus and 1 species, Scaridae representing was 1 genus and 1 species, Scombridae representing was 3 genera and 3 species, Serranidae representing was 1 genus and 4 species, Sillaginidae representing was 1 genus and 3 species, Sphyraenidae representing was 1 genus and 3 species, Stromateidae representing was 1 genus and 2 species, Sciaenidae representing was 1 genus and 1 species, Serranidae representing was 1 genus and 2 species, Teraponidae representing was 1 genus and 1 species, Triacanthidae representing was 1 genus and 1 species, Trichiuridae representing was 2 genera and 2 species diversity of fishes from Mallipattinam coast revealed presence of totally 66 species belonging to 31 families and 39 genera were recorded.

In the present study families such as Ariidae, Carangidae, Centropomidae, Chirocentridae, Cynoglossidae, Drepaneidae and Engraulidae were abundant during postmonsoon season<sup>[36]</sup>. Stromateidae, Sciaenidae, Serranidae, Teraponidae, Triacanthidae and Trichiuridae were abundant during summer season<sup>[37]</sup>. Exocoetidae, Gerreidae, Hemiramphidae, Leiognathidae, Mullidae, Pristigasteridae, Psettodidae and Platycephalidae were abundant during premonsoon season<sup>[38]</sup>. Plotosidae, Scaridae, Scombridae, Serranidae, Sillaginidae and Sphyraenidae were abundant during monsoon season<sup>[19,40]</sup>. Clupeidae, Channidae, Lutjanidae and Mugilidae were available in throughout the year<sup>[40,41]</sup>. It appears that the life histories of many fishes in this region are adapted to the seasonal fluctuations in climatically the area falls under severe monsoon influence and is impacted by cyclones, tidal surge and inland flooding resulting in environmental refugees. The fishes association showed that the habitual and consistent groups dominated the postmonsoon and pre monsoon seasons, while seasonal species dominated during the monsoon season<sup>[42,43]</sup>.

In the present study consider about the fisheries require an unpolluted environment, they are in fact the ultimate sink of pollution generated by rivers and the atmosphere. Productivity is adversely affected by an increasing demand for coastal space and resources and more often than not, this competition is reflected in further degradation of the marine environment<sup>[5,44]</sup>.

Marine fish production is subjected to great fluctuations.

**Table 1: Checklist of fish species recorded during January 2009 to December 2009**

| S. No | Species                         | Family           | Abundant            |
|-------|---------------------------------|------------------|---------------------|
| 1     | <i>Arius arius</i>              | Ariidae          | Postmonsoon         |
| 2     | <i>Caranx sem</i>               | Carangidae       | Postmonsoon         |
| 3     | <i>Alectis indicus</i>          |                  |                     |
| 4     | <i>A.ciliaris</i>               |                  |                     |
| 5     | <i>Alepes sp</i>                |                  |                     |
| 6     | <i>Scomberoides tol</i>         |                  |                     |
| 7     | <i>Trachinotus blochii</i>      |                  |                     |
| 8     | <i>Lates calcarifer</i>         | Centropomidae    | Postmonsoon         |
| 9     | <i>Chanos chanos</i>            | Channidae        | Throughout          |
| 10    | <i>Chirocentrus dorab</i>       | Chirocentridae   | Postmonsoon         |
| 11    | <i>Cynoglossus arel</i>         | Cynoglossidae    | Postmonsoon         |
| 12    | <i>Sardinella longiceps</i>     | Clupeidae        | Throughout the year |
| 13    | <i>S.fimbriata</i>              |                  |                     |
| 14    | <i>S. gibbosa</i>               |                  |                     |
| 15    | <i>Drepane punctata</i>         | Drepaneidae      | Postmonsoon         |
| 16    | <i>Thryssa malabarica</i>       | Engraulidae      | Postmonsoon         |
| 17    | <i>T.dussumieri</i>             |                  |                     |
| 18    | <i>T.malabarica</i>             |                  |                     |
| 19    | <i>T. purava</i>                |                  |                     |
| 20    | <i>Stolephorus indicus</i>      |                  |                     |
| 21    | <i>S.commersoii</i>             |                  |                     |
| 22    | <i>S.insularis</i>              |                  |                     |
| 23    | <i>Cheilopogon spilopterus</i>  | Exocoetidae      | Premonsoon          |
| 24    | <i>Exocoetus volitans</i>       | Exocoetidae      |                     |
| 25    | <i>Cypselurus sp</i>            |                  |                     |
| 26    | <i>Gerres abbreviatus</i>       | Gerreidae        | Premonsoon          |
| 27    | <i>Hemiramphus far</i>          | Hemiramphidae    | Premonsoon          |
| 28    | <i>Gazza inuta</i>              | Leiognathidae    | Premonsoon          |
| 29    | <i>Leiognathus sp</i>           |                  |                     |
| 30    | <i>Lujanus argentimaculatus</i> | Lutjanidae       | Throughout the year |
| 31    | <i>L.malabaricus</i>            |                  |                     |
| 32    | <i>L.lutjanus</i>               |                  |                     |
| 33    | <i>L.rivulatus</i>              |                  |                     |
| 34    | <i>Lutjanus fulviflamma</i>     |                  |                     |
| 35    | <i>Mugil cephalus</i>           | Mugilidae        | Throughout          |
| 36    | <i>Upeneus sulphureus</i>       | Mullidae         | Premonsoon          |
| 37    | <i>U.bensasi</i>                |                  |                     |
| 38    | <i>U.vittatus</i>               |                  |                     |
|       | <i>Ilisha elongate</i>          | Pristigasteridae | Premonsoon          |
| 40    | <i>I.kampen</i>                 |                  |                     |
| 41    | <i>Psettodes erumei</i>         | Psettodidae      | Premonsoon          |
| 42    | <i>Platycephalus indicus</i>    | Platycephalidae  | Premonsoon          |
| 43    | <i>Plotosus canius</i>          | Plotosidae       | Monsoon             |
| 44    | <i>Scarus ghobban</i>           | Scaridae         | Monsoon             |
| 45    | <i>Rasterigella kanagurta</i>   | Scombridae       | Monsoon             |
| 46    | <i>Auxis sp</i>                 |                  |                     |
| 47    | <i>Scomberomorus sp</i>         |                  |                     |
| 48    | <i>Epinephelus tauvina</i>      | Serranidae       | Monsoon             |
| 49    | <i>E.bleekeri</i>               |                  |                     |
| 50    | <i>E. malabarica</i>            |                  |                     |
| 51    | <i>E.hexagonatus</i>            |                  |                     |
| 52    | <i>Sillago sihama</i>           | Sillaginidae     | Monsoon             |
| 53    | <i>S.aeolus</i>                 |                  |                     |
| 54    | <i>S.ingenuua</i>               |                  |                     |
| 55    | <i>Sphyraena barracuda</i>      | Sphyraenidae     | Monsoon             |
| 56    | <i>S.forsteri</i>               |                  |                     |
| 57    | <i>S.jello</i>                  |                  |                     |
| 58    | <i>Pampus argenteus</i>         | Stromateidae     | Summer              |
| 59    | <i>P. chinensis</i>             |                  |                     |
| 60    | <i>Lepturacanthus savala</i>    |                  |                     |
| 61    | <i>Johnius sp</i>               | Sciaenidae       | Summer              |
| 62    | <i>Epinephelus diacanthus</i>   | Serranidae       |                     |
| 63    | <i>E. lanceolatus</i>           | Serranidae       |                     |
| 64    | <i>Terapon puta</i>             | Teraponidae      |                     |
| 65    | <i>Triacanthus biaculeatus</i>  | Triacanthidae    |                     |
| 66    | <i>Trichiurus lepturus</i>      | Trichiuridae     |                     |

In recent years the rate of increases in production has been very marginal inspire of increasing the fishing effort by introducing more mechanised fishing boats every year. Several types of net

fishing have also been responsible for overexploitation of marine resources [45]. Some times in this area the catch per unit effort has been going down, the fishing effort has increased beyond the capacity of the fishery resource to sustain [5]. It would therefore, be product not to increase the fishing effort particularly in the area and to pay more attention to mariculture including aquaculture nearby coastal areas. This study agrees with previous studies [17,46,47].

In the present study aquaculture can provide relief to overexploited species. Overexploitation, both biological and economical, is generally a result of the higher prices obtainable for such species, which in turn is what provides investors with good profitability from related aquaculture operations. By contributing to satisfying the demand for such species, aquaculture can have a positive impact on the state of wild species, higher supplies will tend to bring down prices, making capture fishing efforts less attractive. Different sector of fisheries in order to maximize their catches use smaller meshes. Thus, small fishes dominate catches and lots of juveniles and eggs are destroyed. Since the fishery is of very small magnitude, the species can be conserved by restricting to the traditional way of fishing and prohibiting trawling in the nursery grounds [5, 48, 49, 50]. When fishing exploits a resource it changes the mortality and therefore the behaviour of the system. There is also need for updating the information for the benefit of research workers, administrators and other stake holders, resource wise estimates of marine fish landings [5]. In the present study indicate that represent various scenarios and situations in using sea ranching and marine hatchery enhancement to generate income, re-establish fisheries and conserve aquatic biodiversity.

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