

# Preliminary Study on the Abundance of Ornamental Fishes along Gulf Of Mannar, South East Coast of India

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## Abstract

The coral reefs provide a suitable shelter for all variety of fishes. Coral reefs comprise the most specious assemblage of vertebrates on the earth. The variety of shapes, sizes, colours, behaviour and ecology exhibited by reef fishes is amazing. Gulf of Mannar in the south east coast of India extends from Rameswaram Islands in the north to Kanyakumari in the south. It has a chain of 21 islands stretching from Mandapam to Tuticorin to a distance of 140 km along the coast. The Gulf's 3600 species of plants and animals make it biologically one of the richest coastal regions in India. The present study was conducted in the selected sites from Gulf of Mannar. The current study aims in the inventory to reveal the potential resources of Tuticorin, Vembar, Keelakarai, Mandapam and Rameswaram reef regions. The survey conducted during March to July 2012 at these areas revealed the presence of 45 species of ornamental fishes categorized under 5 orders, 26 families and 37 genera. The species rich families were Pomacentridae (damsel fishes), Lutjanidae (snapper), Siganidae (spinefoot), Terapontidae (therapon perch), Balistidae (file-fishes). The Tuticorin, Keelakarai and Rameswaram reef regions were identified as the areas rich in fish diversity.

**Keywords:** Coral reefs, Gulf of Mannar, Tuticorin, Vembar, Keelakarai, Mandapam and Rameswaram

## Introduction

The marine aquarium fishes referred to as 'marine ornamental' also in recent years are known to abundant in the tropical seas particularly in the regions in the sea which are rich in corals, seaweeds, seagrasses and also in the regions which have rocky bottom. Coral reef fishes comprise the most special assemblage of vertebrates on earth (Bell and Galzin, 1984). The variety of shapes, sizes, colours, behaviour and ecology exhibited by reef fishes is amazing. Coral fishes are classified in more than 100 different families. The vast majorities are bony fishes but small minorities are cartilaginous. Reef fishes are the most diverse element in the reef fauna and because of their wider ecological significance, some families of reef fish presence valuable groups for monitoring the health of reefs and for investigating factors underlying the high species diversity characteristics of reef ecosystem (Perera and Appeldoorn, 2008). Some fishes such as species of butterfly fish have been proposed as useful indicator species of reef development as well as health. Our resources in the reefs are fast dwindling and hence the study of diversity in the coral reef ecosystem is of great significance in order to assess the changes over the period of time (Murty, 2002). The strength of association between organisms and their habitat can provide an indication of the level of habitat change and an array of studies have documented positive relationships between fish abundance as well as diversity and coral cover (Carpenter and Niem, 2001). Studies

on the most diverse element i.e.; fish species in the coral reef ecosystem help to understand the present status and the changes taking place over a period of time.

Gulf of Mannar in the south east coast of India extends from Rameswaram Island in the North to Kanyakumari in the South. It has a chain of 21 islands stretching from Mandapam to Tuticorin to a distance of 140 km along the coast (Kumaraguru et al, 2008). Gulf of Mannar is endowed with a rich variety of marine organisms because its biosphere include ecosystems of coral reefs, rocky shores, sandy beaches, mudflats, estuaries, mangrove forests, seaweed stretches and seagrass beds. Gulf of Mannar is considered as 'Biologists paradise' for it has 3600 species of flora and fauna (Gurusamy et al, 1989).

## Materials and Methods

### Study Area:

After analyzing the diversity of species and species richness, five regions were fixed as my research stations. The first site Tuticorin, second Vembar, third Keelakarai, fourth Mandapam and fifth site Rameswaram. The survey was conducted during March 2012 to August 2012.

### Fishing:

Trap fishing was done in Keelakarai, Mandapam and Rameswaram. The traps were kept in the water for a minimum period of 24 hours and a maximum period of 120 hours. The traps were covered by nylon mesh of size 1 cm size to prevent the escape of small fishes. Traps are the best environment friendly gears as they do not cause any destruction to corals. In Tuticorin and Vembar, fishes are collected from trawl by catch as there is no trap fishing.

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Table 1. Ornamental fishes from five stations of Gulf of Mannar during March 2012-August 2012

Sl. No.	Species	Family	Order
1	<i>Therapon jarbua</i>	Theraponidae	Perciformes
2	<i>Eutherapon theraps</i>	Theraponidae	Perciformes
3	<i>Pelates quadrilineatus</i>	Theraponidae	Perciformes
4	<i>Gerres abbreviatus</i>	Gerridae	Perciformes
5	<i>Epinephelus tauvina</i>	Serranidae	Perciformes
6	<i>Epinephelus merra</i>	Serranidae	Perciformes
7	<i>Apolemichthys xanthurus</i>	Pomacanthidae	Perciformes
8	<i>Amphiprion sebae</i>	Pomacentridae	Perciformes
9	<i>Dascyllus trimaculatus</i>	Pomacentridae	Perciformes
10	<i>Abudefduf vaigiensis</i>	Pomacentridae	Perciformes
11	<i>Abudefduf septemfasciatus</i>	Pomacentridae	Perciformes
12	<i>Abudefduf biocellatus</i>	Pomacentridae	Perciformes
13	<i>Pomacentrus trichourus</i>	Pomacentridae	Perciformes
14	<i>Pomacentrus cyanomos</i>	Pomacentridae	Perciformes
15	<i>Siganus oramin</i>	Siganidae	Perciformes
16	<i>Siganus javus</i>	Siganidae	Perciformes
17	<i>Lutianus kasmira</i>	Lutjanidae	Perciformes
18	<i>Lutianus fulviflamma</i>	Lutjanidae	Perciformes
19	<i>Lutianus ruselli</i>	Lutjanidae	Perciformes
20	<i>Lutianus rivulatus</i>	Lutjanidae	Perciformes
21	<i>Aphareus furcatus</i>	Lutjanidae	Perciformes
22	<i>Dendrochirus zebra</i>	Scorpaenidae	Perciformes
23	<i>Callyodon oktodon</i>	Scaridae	Perciformes
24	<i>Parupeneus indicus</i>	Mullidae	Perciformes
25	<i>Tripteron orbis</i>	Ephippidae	Perciformes
26	<i>Scolopsis vosmeri</i>	Scolopsidae	Perciformes
27	<i>Acanthurus gahm</i>	Zanclidae	Perciformes
28	<i>Scatophogus argus</i>	Scatophagidae	Perciformes
29	<i>Drepane punctata</i>	Drepanidae	Perciformes
30	<i>Chaetodon collare</i>	Chaetodontidae	Perciformes
31	<i>Heniochus acuminatus</i>	Chaetodontidae	Perciformes
32	<i>Linophora vagabunda</i>	Chaetodontidae	Perciformes
33	<i>Gnathanodon speciosus</i>	Carangidae	Perciformes
34	<i>Pampheris vanicolensis</i>	Pempheridae	Perciformes
35	<i>Trachinocephalus myops</i>	Synodontidae	Scopeliformes
36	<i>Pseudorhombus triocellatus</i>	Bothidae	Pleuronectiformes
37	<i>Samaris cristatus</i>	Pleuronectidae	Pleuronectiformes
38	<i>Arothron hispidus</i>	Tetraodontidae	Tetraodontiformes
39	<i>Chelonodon patoca</i>	Tetraodontidae	Tetraodontiformes
40	<i>Arathron imaculatus</i>	Tetraodontidae	Tetraodontiformes
41	<i>Odonus niger</i>	Balistidae	Tetraodontiformes
42	<i>Balistoides viridescens</i>	Balistidae	Tetraodontiformes
43	<i>Triacanthus brevistoris</i>	Triacanthidae	Tetraodontiformes
44	<i>Canthigaster margaritatus</i>	Canthigasteridae	Tetraodontiformes
45	<i>Obstrcion tuberculata</i>	Ostraciontidae	Tetraodontiformes

### Photography:

Immediately on capture, fishes were thoroughly cleaned. The fins were well spread and fixed with needles on cardboard and few drops of formalin placed on these to prevent the fins from folding back. After completing the photography, specimens were preserved in 10% formalin.

### Identification:

Identification of specimens was done with the help of texts like "Freshwater fishes of Ceylon" by Ian. S. R. Munro and "Smith's Seafishes" by Margaret M. Smith and Philip G. Heemstra and with available CD-ROMS.

### Results and Discussion

A total of 45 species belonging to 37 genera, 26 families and 5 orders were recorded along the five stations of Gulf of Mannar regions. The species rich families were Pomacentridae (damsel fishes), Lutjanidae (snapper), Siganidae (spine foot), Theraponidae (therapon perch), Balistidae (file fishes), Tetraodontidae.

Considering the species diversity obtained, Pomacentridae family dominated followed by Lutjanidae and Tetraodontidae; Pomacentridae and Pomacanthidae were dominated considering the number of fishes got. As the order

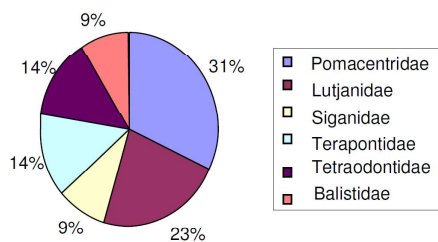


Figure 1. Major families contributing to fish abundance at Gulf of Mannar area during March 2012 to August 2012

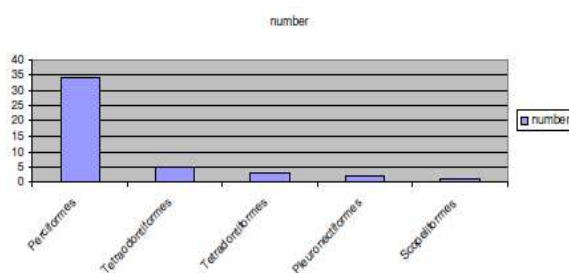


Figure 2. Composition of ornamental of different orders obtained from Gulf of Mannar

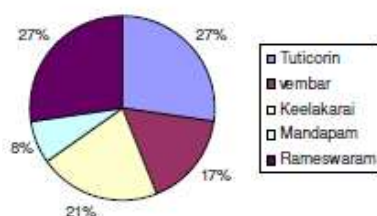


Figure 3. Relative abundance of species from different areas of Gulf of Mannar

wise distribution concern Perciformes dominated as it occupies large number of species. Among the five areas Tuticorin and Rameswaram are found to be rich in ornamental fish diversity followed by Keelakarai, Vembar and Mandapam. From these data we can assume that the ornamental fish diversity is much higher in these areas.

### Conclusion

Ornamental fishes are important to many processes occurring in the marine environment and loss would affect the health of the ecosystem (Sale, 2006). The present study revealed rich and varied diversity of ornamental fishes around the Gulf of Mannar area. Degradation of the reef habitat and overharvesting are leading to heavy losses in the ornamental fish diversity around the globe and the study is relevant in this line which could be a baseline for further studies.

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