

ORNAMENTAL FISH RESOURCES OF LAKSHADWEEP

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ABSTRACT

In the lagoons of Lakshadweep islands, ornamental fishes of the families Labridae, Pomacentridae, Serranidae, Acanthuridae, Chaetodontidae, Callyodontidae, Mullidae, Balistidae, Holocentridae, Canthigasteridae, Pomacanthidae and Zanclidae, represented by a total of 191 species are important. Preliminary estimates show that Kalpeni has the largest population size, followed by Amini, Kadamat, Chetlat, Kavaratti, Agatti, Kiltan and Bitra; population per hectare was found to be highest in Amini, followed by Chetlat, Kalpeni, Kiltan, Kadamat, Kavaratti, Bitra and Agatti. Certain measures for sustainable exploitation of ornamental fishes are indicated.

INTRODUCTION

The marine ornamental fishes are normally inhabitants of rocky, coral, seaweed, seagrass and rubble regions. The lagoons of Lakshadweep being rich in these habitats harbour one of the richest populations of ornamental fishes in the Indo-Pacific region. Jones and Kumaran (1980) published descriptions and figures of over 600 fish species available in the sea around different islands. While this work continues to be the only reference work on fish taxonomy of this region, adequate information on availability and abundance of ornamental fishes, their population, sizes and biology is not available. A short indicative survey on ornamental fishes was conducted in 1987 (Murty et al. 1989) in the lagoons of all the inhabited islands. This being a short duration (January-March 1987) survey, it only helped to have a knowledge of important ornamental fishes available for exploitation. The studies of Madan Mohan et al. (1986), Pillai et al. (1983, 1987, 1992), Pillai and Madan Mohan (1990) and Vijayanand and Varghese (1990) added to the knowledge on the biology and distribution of ornamental fishes from selected islands.

Due to the importance of marine ornamental fishes in the export trade, some exploratory surveys of marine ornamental fishes from India were conducted (Anon, 1986, Tomey, 1985, 1986). However, due to lack of adequate information on the number of species available for exploitation, their stock sizes

and biology relevant to stock assessment, the exploitation of these fishes from Lakshadweep was not initiated. The Central Marine Fisheries Research Institute undertook a project on Survey and Assessment of Ornamental Fishes of Lakshadweep and the same is being continued. It was, however, felt desirable to present the details of this work at the Workshop on the Status of Scientific Database on Lakshadweep, primarily to focus attention among the concerned on this important area of research and to identify the important species of ornamental fish from different islands of Lakshadweep. As the survey and analyses of data are yet to be completed, the present results are only provisional and indicative.

DATABASE

The present survey was initiated in November 1993, and the different islands were visited as often as possible depending on the availability of ship transport. At each island at least one week was spent on each visit. Fishing was conducted using gill nets (nylon monofilament, white) of different mesh sizes ranging from 20 to 50 mm and also encircling nets having a mesh size of 10 mm. Operation of gill nets was rendered difficult because of the corals in the lagoons. This has often resulted in considerable damage to the nets and hence to condemn them. Fishing was carried out during different times in day in different parts of the lagoon (Fig. 1). Fishing was also attempted during night times

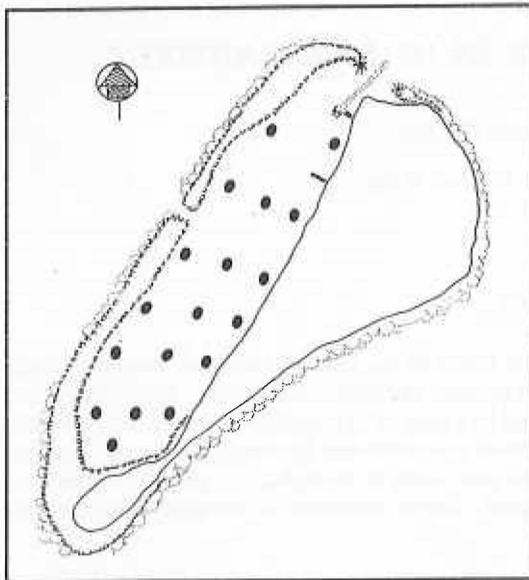


Fig. 1 Map of Kavaratti Island showing the sampling sites (closed circles) in the lagoon

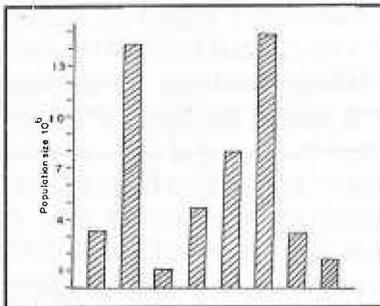


Fig. 2 Estimated population size of 12 families of ornamental fishes in different islands. (1. Agatti, 2. Amini, 3. Bitra, 4. Chetlat, 5. Kadamat, 6. Kalpeni, 7. Kavaratti, 8. Kiltan)

but because of the large scale damage caused by large fishes to the nets as well as the fish caught, fishing during night time was suspended. All the fish caught were preserved in formalin after identifying them in fresh condition and measuring their length and weight. These specimens were brought to the laboratory at Kochi to carry out investigations on various aspects of biology. Using the catch data obtained so far in the lagoons of each island, preliminary estimate of stock size of each family of ornamental fishes was made.

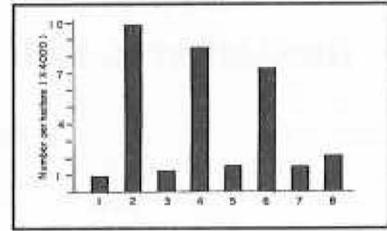


Fig. 3 Estimated number per hectare of ornamental fishes of 12 families in the lagoons of different islands

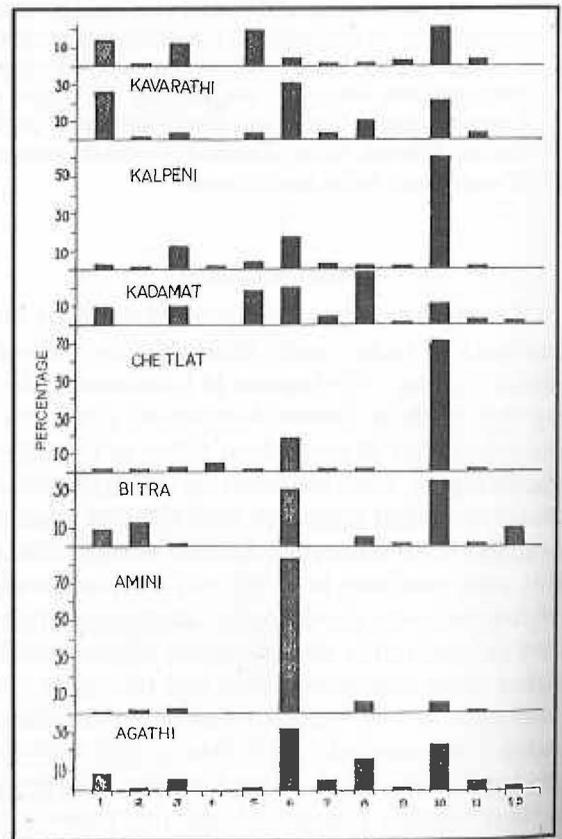


Fig. 4 Proportion of each family of ornamental fishes in the total estimated population size of 12 families in each island 1. Acanthuridae, 2. Balistidae, 3. Callyodontidae, 4. Canthigasteridae, 5. Holocentridae, 6. Labridae, 7. Chaetodontidae, 8. Mullidae, 9. Pomacanthidae, 10. Pomacentridae, 11. Serranidae, 12. Zanclidae

IMPORTANT ORNAMENTAL FISH RESOURCES AND THEIR RELATIVE ABUNDANCE

Of the 600 species of fish known from the Laksha-dweep islands, about 300 species are of ornamental value. For the purpose of this presenta

tion, only very important groups of ornamental fishes represented by 12 families were selected. These 12 families are known to be represented by 191 species. Among them, the family Labridae (wrasses) has the largest number of species (45) followed by Pomacentridae (Damsel fish, 35 species), Serranidae (groupers, 21 species) Acanthuridae (surgeon fish, 19 species), Chaetodontidae (Butterfly fish, 16 species), Callyodontidae (parrot fish, 14 species), Mullidae (goat fish, 14 species), Balistidae (trigger fish, 10 species), Holocentridae (squirrel fish, 9 spe-

cies), Canthigasteridae (puffer fish, 4 species), Pomacanthidae (angel fish, 3 species) and Zanclidae (moorish idol, 1 species). The data were collected from eight islands (Agatti, Amini, Bitra, Chetlat, Kadamat, Kalpeni, Kavaratti, and Kiltan). The preliminary estimates of average stock size of fishes of these 12 families (Fig. 2) show that Kalpeni has the largest population size followed by Amini, Kadamat, Chetlat, Kavaratti, Agatti, Kiltan and Bitra. Among these islands, however, Kadamat has the largest lagoon followed by Agatti, Kavaratti, Kalpeni, Amini,

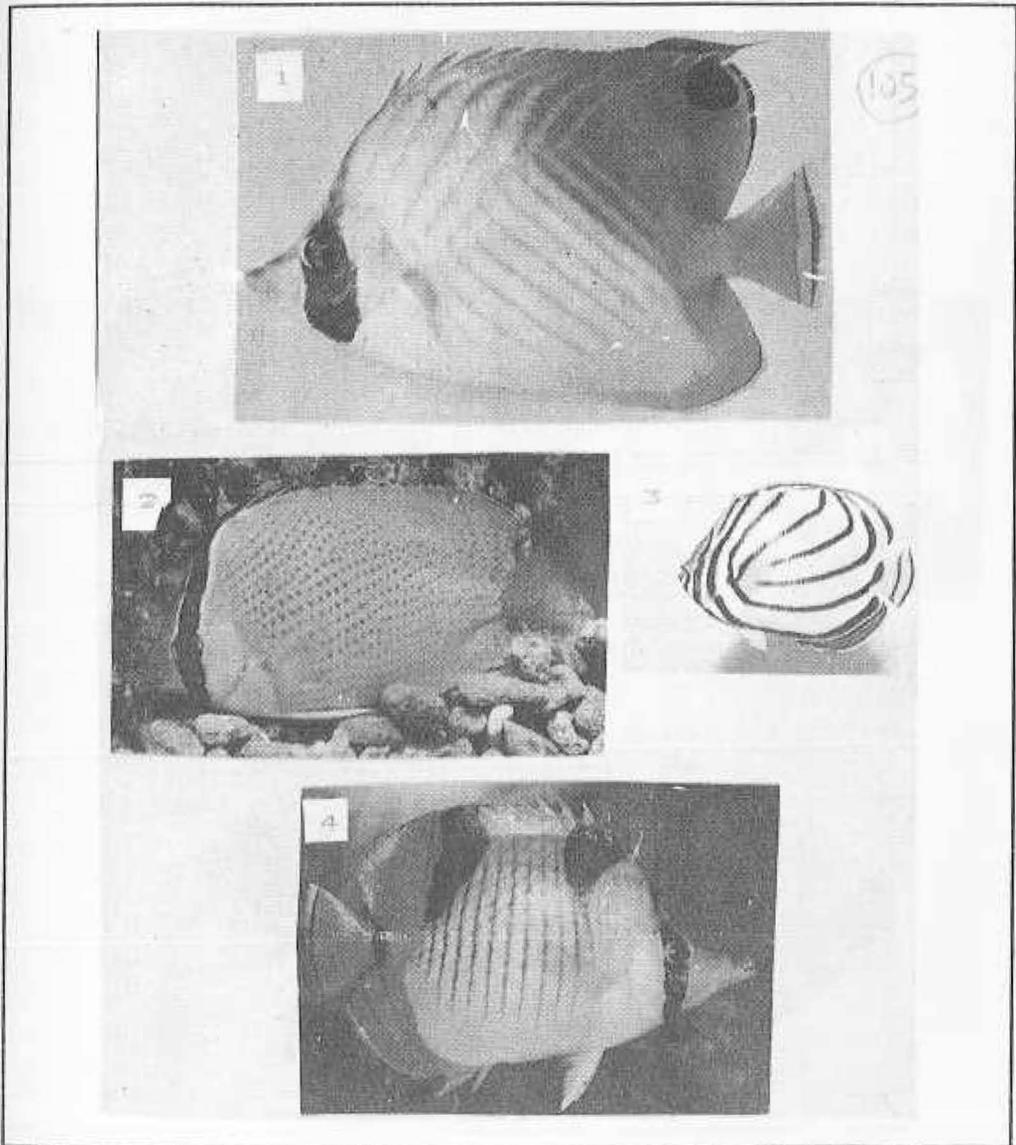


Plate I. 1. *Cheatodon auriga* (Threadfin butterfly fish) 2. *C. citrinellus* (Speckled Butterfly fish)
 3. *C. meyeri* (Maypole butterfly fish) 4. *C. falcula* (Saddled butterfly fish)

Bitra, Kiltan and Chetlat. To understand the population density, hence, the stock size per hectare of lagoon area was estimated for all these islands (Fig.

3). It was found that the density was highest in Amini, followed by Chetlat, Kalpeni, Kiltan, Kadamat, Kavaratti, Bitra and Agatti.

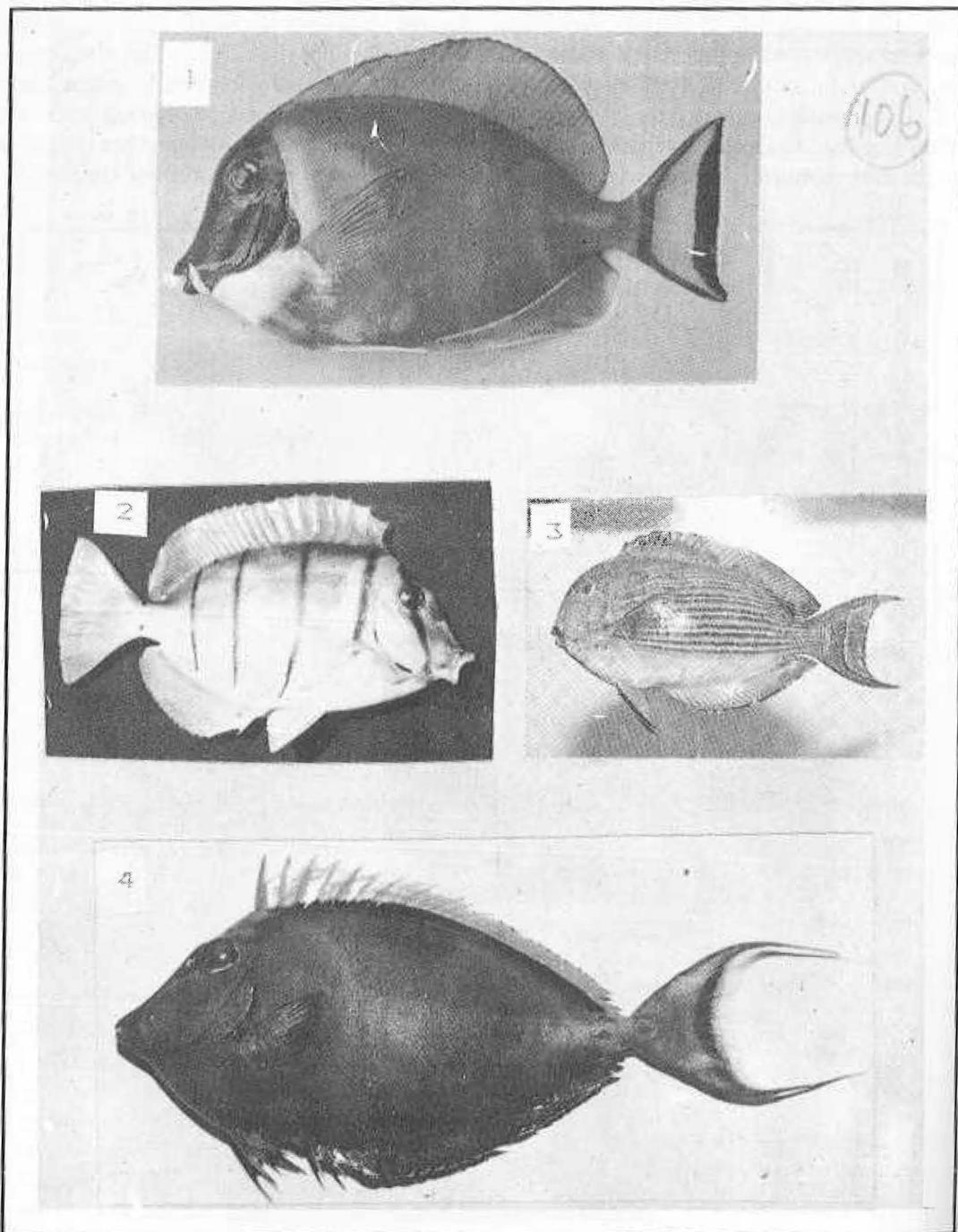


Plate II. 1. *Acanthurus leucostemon* (Powderblue surgeon)
3. *A. lineatus* (Bluebanded surgeon)

2. *A. triostegus* (Convict surgeon)
4. *Naso lituratus* (orange-spine unicorn)

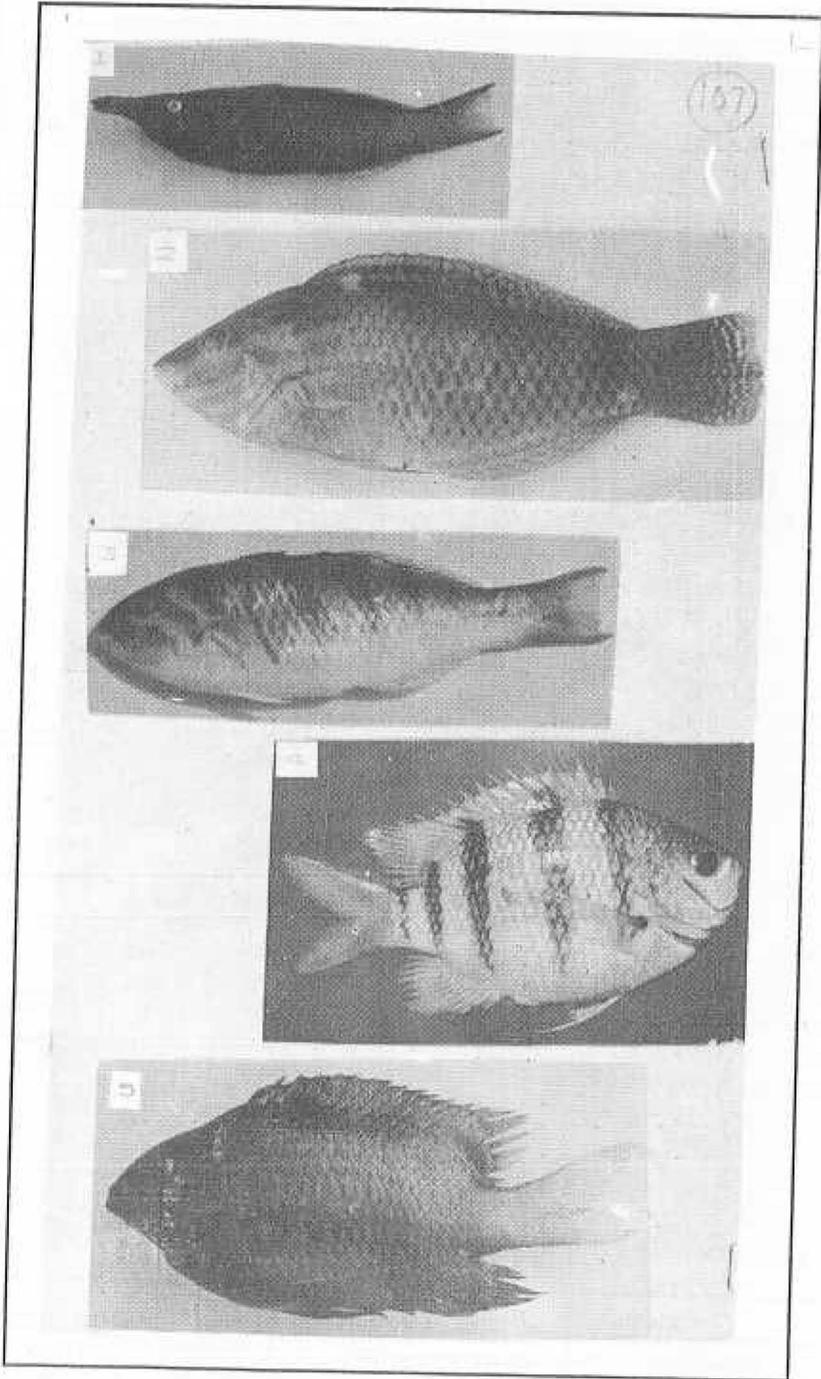


Plate III. 1. *Gomphosus caeruleus* (Bird fish)
2. *Halicoeres centriquadrus* (checkerboard wrasse)
3. *Thalassoma hardwickii* (sixbar wrasse)
4. *Abudedefduf sexfasciatus* (stripe-tail damsel)
5. *A. lacrymatus* (Jewel damsel)

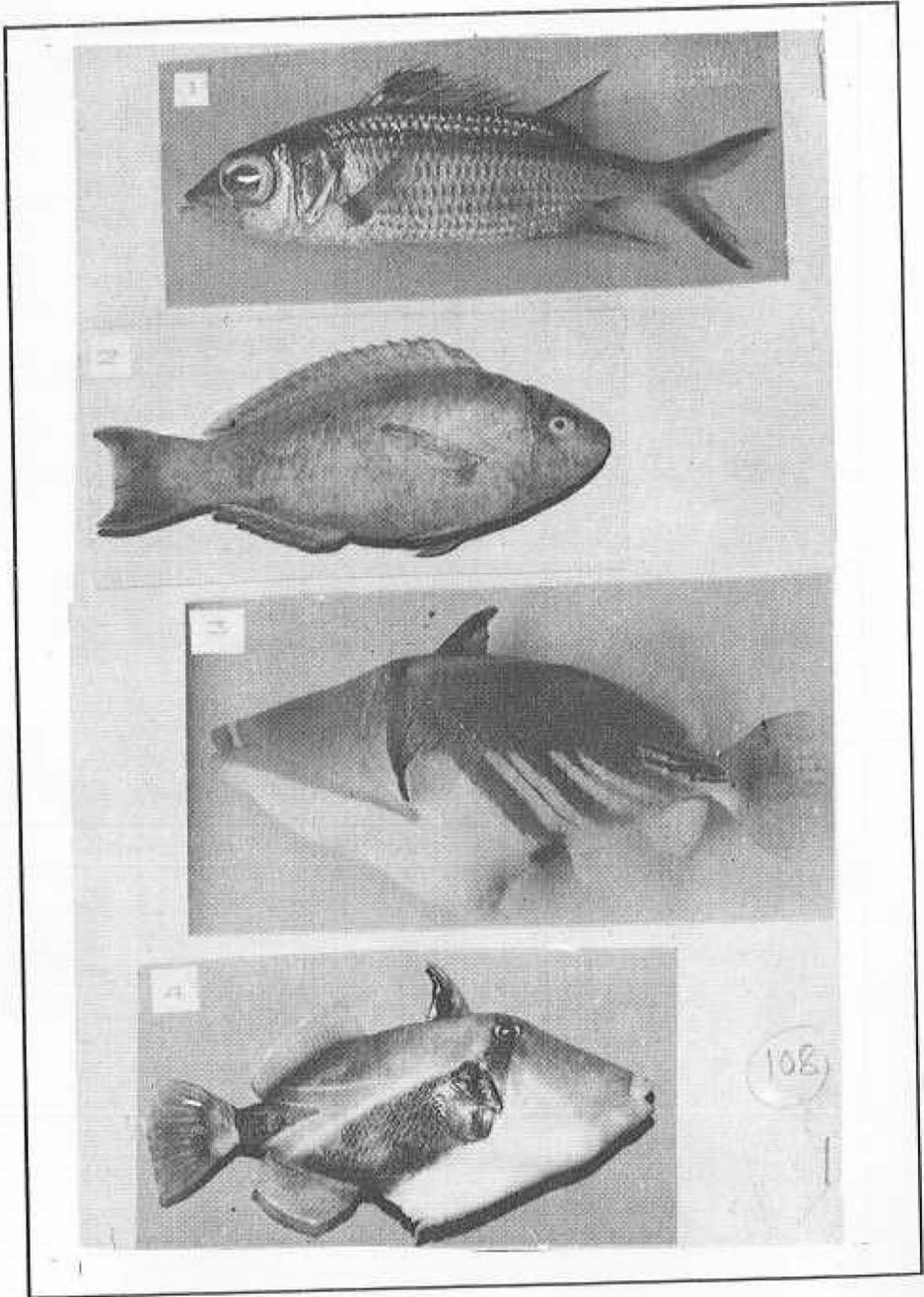


Plate IV. 1. *Neoniphon sammara* (spotfin squirrel fish) 2. *Callyodon bataviensis* (palenose parrot fish)
 3. *Rhineacanthus aculeatus* (Blackbar trigger fish) 4. *R. rectangulus* (Patchy trigger fish)

Among the different families (Fig. 4), the wrasses and damsel fishes are the most dominant in each of the islands. However, Agatti, Amini and Kavaratti are the richest in wrasses; Bitra, Chetlat, Kalpeni and Kiltan in damsel fishes. Besides, the surgeon fishes are abundant in Kavaratti and Kiltan; squir-

rel fish in Kiltan and Kadamat; parrot fish in Kiltan, Kadamat and Kalpeni, goat fish in Agatti, Kadamat and Kavaratti.

Of the 191 species known in the 12 families, fishes of 125 species were collected. Of these about 86 species are important (Table 1 and Plates I-IV) for

TABLE 1

IMPORTANT SPECIES OF ORNAMENTAL FISHES OF LAKSHADWEEP

Sl. No.	Family	Popular Name	Number of species known	Important species			
1.	Acanthuridae	Surgeon fish	19	Ctenochaetus strigosus			
2.				Acanthurus triostegus			
3.				A. lineatus			
4.				A. lecusternon			
5.				A. nigricauda			
6.				A. matoides			
7.				A. elongatus			
8.				Naso lituratus			
9.				N. unicornis			
10.				N. brevirostris			
11.				N. tuberosus			
12.				Zebrasoma veliferum			
13.	Balistidae	Trigger fish	10	Rhineacanthus aculeatus			
14.				R. rectangulus			
15.				Balistapus undulatus			
16.				Balistoide's viridescens			
17.	Callyodontidae	parrot fish	14	Callyodon taeniurus			
18.				C. bataviensis			
19.				C. scaber			
20.				C. niger			
21.				C. ghobban			
22.				C. sordidus			
23.				Cryptotomus spinidens			
24.				Leptoscarus vaigiensis			
25.	Canthigasteridae	puffer fish	4	Canthigaster margaritatus			
26.	Chaetodontidae	Butterfly fish	16	Heniochus acuminatus			
27.				Megaprotodon strigangulus			
28.				Chaetodon meyeri			
29.				C. lunula			
30.				C. citrinellus			
31.				C. trifasciatus			
32.				C. xanthocephalus			
33.				C. falcata			
34.				C. auriga			
35.				C. collare			
36.				Holocentridae	Squirrel fish	9	Neoniphon sammara
37.							Sargocentron punctatissimum
38.							S. spinifer
39.							S. diadema
40.							S. caudimaculatus
41.							Myripristis murdjan
42.				M. adustus			

Table I contd.

Sl. No.	Family	Popular Name	Number of species known	Important species
43.	Labridae	Wrasses	45	Halichoeres scapularis
44.				H. kawarin
45.				H. centriquadrus
46.				H. marginatus
47.				H. notopsis
48.				Thalassoma hardwickii
49.				T. lunare
50.				Gomphosus caeruleus
51.				G. varius
52.				Anampses caeruleopunctatus
53.				Cheilio inermis
54.				Stethojulis axillaris
55.				S. albovittata
56.				S. trilineata
57.	Novaculichthys taeniurus			
58.	Epibulus insidiator			
59.	Cheilinus undulatus			
60.	C. trilobatus			
61.	Mullidae	Goat fish	14	Mulluoidichthys samoensis
62.				M. auriflamma
63.				parupeneus barberinus
64.				P. macronemus
65.				P. bifasciatus
66.	Pomacanthidae	Angel fish	3	Centropyge multispinis
67.				Pomacanthodes imperator
68.	Pomacentridae	Damsel fish	35	Dascyllus aruanus
69.				D. reticulatus
70.				Chromis caeruleus
71.				C. chrysurus
72.				Pomacentrus nigricans
73.				P. albifasciatus
74.				P. melanopterus
75.				Abudefduf sexfasciatus
76.				A. saxatilis
77.				A. lacrymatus
78.				A. dickii
79.				A. biocellatus
80.				A. xanthozona
81.				A. zonatus
82.				A. galucus
83.	Serranidae	Groupers	21	Cephalopholis argus
84.				Epinephelus hexagonatus
85.				E. merra
86.	Zanclidae	Moorish idol	1	Zanclus canescens

exploitation.

REMARKS

The ornamental fishes in the lagoons of Lakshadweep are not presently exploited on a commercial scale. The present work, on completion, is expected to give information on distribution, stock size, potential yield, biology and population dynamics of dominant species. The lagoons being very shallow, the fishes are vulnerable to over exploitation, once commercial operations are initiated. Besides, some of the fishes being inhabitants of coral reefs, the exploitation of fishes can lead to damage to the live corals and eventually to environmental degradation. The following aspects need consideration before exploitation and export of ornamental fishes from the lagoons and reef flats of different islands is taken up on a commercial scale :

1. Some species of wrasses, (*Halichoeres centricaudrus*, *H. marginatus*, *H. kawarin*, *Stethojulis axillaris*), damsel fishes (*Dascyllus aruanus*, *Chromis caeruleus*,

Abudefduf saxatilis, *A. sexfasciatus*, *A. glaucus*), surgeon fishes (*Acanthurus triostegus*, *A. leucosternon*), parrot fishes (*Callyodon taeniurus*, *C. scaber*), butterfly fishes (*Chaetodon auriga*, *C. citrinellus*) and puffer fishes (*Canthigaster marginatus*) offer immense potential for exploitation and export; this calls for developing markets for these fishes

2. Fishing should be permitted by traps, hand nets and other non-destructive methods
3. Careful vigil is necessary to see that the corals are not damaged while collecting fishes living among them or in their vicinity
4. The exploitation and export have to be routed through a single agency to ensure close monitoring; information on species-wise numbers caught and exported and their length have to be recorded and maintained well
5. One of the lagoons has to be left unexploited to serve as a sanctuary and help in preserving the biodiversity.

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