

A Field Guide to
GROUPEL AND SNAPPER FISHES
of Andaman and Nicobar Islands

P. T. RAJAN



Zoological Survey of India

A Field Guide to Grouper and Snapper Fishes of Andaman and Nicobar Islands

(Family : SERRANIDAE, Subfamily : EPINEPHELINAE
and Family : LUTJANIDAE)

P. T. RAJAN

*Andaman & Nicobar Regional Station
Zoological Survey of India
Haddo, Port Blair - 744102*

Edited by the Director, Zoological Survey of India, Kolkata



**Zoological Survey of India
Kolkata**

CITATION

Rajan, P. T. 2001. *A field guide to Grouper and Snapper Fishes of Andaman and Nicobar Islands*. (Published - Director, Z.S.I.)

Published : December, 2001

ISBN 81-85874-40-9

Front cover : Roving Coral Grouper (*Plectropomus pessuliferus*)

Back cover : A School of Blue banded Snapper (*Lutjanus kasmira*)

© Government of India, 2001

ALL RIGHTS RESERVED

- No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without the prior permission of the publisher.
- This book is sold subject to the condition that it shall not, by way of trade, be lent, re-sold, hired out or otherwise disposed of without the publisher's consent, in any form of binding or cover other than that in which it is published.
- The correct price of this publication is the price printed on this page. Any revised price indicated by a rubber stamp or by a sticker or by any other means is incorrect and should be unacceptable.

PRICE

Indian Rs. 400.00

Foreign \$ 25; £ 20

Published at the Publication Division by the Director, Zoological Survey of India, 234/4, AJC Bose Road, 2nd MSO Building, (13th Floor), Nizam Palace, Calcutta-700 020 after laser typesetting by Computech Graphics, Calcutta 700019 and printed at Power Printers, New Delhi - 110002.

FOREWORD

The economy of the Andaman and Nicobar Islands depends on the optimum exploitation of its marine resources. Keeping in view the need for preservation of ecology, till now the Islands' reef resources are largely untapped. In recent years, however, the use of reef resources has increased dramatically with the growth of the tourist industry, the development of new export markets for reef fishery products and the growth of the island population.

Groupers and snappers are popular marine food fish of high market value in many parts of the world. Their habitats are coral reefs, rocky and mangrove environment. Because of their voracious feeding habits and shallow habitats, these fish are easy targets for small-scale fisherman. A commercial fishery wholly based on the natural stocks will soon be under the threat of over-exploitation, if the fishery is not properly managed. Fisheries management calls for collaborative efforts on the part of policy makers, researchers, administrators and island communities.

The present volume is the first in the series of "Field Guides" and deals with sea fishes of the Islands. This field guide would therefore undoubtedly be an asset to the agencies responsible for fisheries development and for making investment decisions with regard to industrial fisheries. The author P. T. Rajan deserves congratulation.

Raj Niwas,
17-05-2000

I. P. Gupta
Lieutenant Governor
Andaman & Nicobar Islands

PREFACE

Since the publication of the monographic account on Indian fishes (two volumes) by Francis Day in 1889, knowledge in this field has increased considerably. There have been many additions and revisions. The present field guide on Grouper fishes (43 species) and Snapper Fishes (42 species) gives complete information of their taxonomy, habitat, fishing gears used and fishery importance. The colour photographs help in easy identification.

It is hoped that this field guide will serve as an important and handy tool to specialists, research students, policy makers and commercial fish traders interested in the Grouper and Snapper fishes of these Islands.

November, 2000

P. T. Rajan
Zoological Assistant
Zoological Survey of India
Port Blair

ACKNOWLEDGEMENTS

The author wishes to express his thanks to Dr. J.R.B. Alfred, Director, Zoological Survey of India, Calcutta for his kind encouragement. Thanks are also to Dr. D.R.K. Sastry, Officer-in-charge, Zoological Survey of India, Port Blair for his guidance and facilities. Personal thanks are also due to Dr. K. Venkataraman, Marine Biological Station, Zoological Survey of India, Chennai for finding solutions to many taxonomic problems served as inspiration and impetus for my work. I offer special thanks to Dr. J.E. Randall (B.P. Bishop Museum, Hawaii) and Dr. G.R. Allen (Western Australian Museum), they made available their collection of literature on Groupers and Snappers. I am grateful to authorities of Wild Life division, Fishery Survey of India Department of Fisheries and ANIIDCO for various courtesies extended during the work. I also acknowledge the help rendered by G. Ponnuswamy in photography and A. Polycap in field collections. I am also thankful to Shri Rati Ram, Publication Production Officer, for his Constant supervision of this publication.

CONTENTS

1.	INTRODUCTION	1
	Grouper and Snapper Fisheries	3
2.	RECOMENDATIONS	4
	Imposing a system of limited entry in Grouper Capture	4
	Improving reef fish catch and effort Data collection	4
	— Gear restriction	5
	— Improving Co-ordination and Co-operation	5
	— Open and closed periods for grouper fishery	5
	— Size restriction in grouper fishery	5
	— Marine reserves	6
	— Aquaculture	6
3.	MATERIAL AND METHODS	7
4.	TABLE I	8
	Analysis of genera and species of Groupers present in Andaman and Nicobar Islands in relation to those of the world and Indo-Pacific region	
5.	TABLE II	9
	Analysis of genera and species of Snappers present in Andaman and Nicobar Islands in relation to those of the world and Indo-Pacific region	
6.	TABLE III	10
	Groupers of Andaman and Nicobar Islands	
7	TABLE IV	14
	Sale of Snapper fish by Andaman Fisheries Ltd. Port Blair from 1996 to 1999	
8.	TABLE V	16
	Sale of Grouper fish by Andaman Fisheries Ltd. Port Blair from 1996 to 1999	
9.	SYSTEMATICS OF GROUPERS AND SNAPPERS	18
10.	EXTERNAL FEATURES AND MEASUREMENTS OF FISH	39
11.	GROUPERS	40
12.	SNAPPERS	70
13.	GLOSSARY	98
14.	REFERENCES	100
15.	SYSTEMATIC INDEX	102

INTRODUCTION

The Andaman and Nicobar Islands is situated in the Bay of Bengal between 6° 45' and 13° 41' N latitudes and 92° 12' and 93° 57' E longitudes nearly in a North-South direction and present a shape of crescent. The Andaman group and the Nicobar group, separated by the 10 degree Channel, which is about 100 km wide. While in the extreme north lies Land Fall Island, that is only 37 km away from Coco islands of Myanmar (Burma), the Southern most tip- Indira Point in the Great Nicobar Islands is barely 147 km. from Sumatra and Indonesia.

The shelf topography of the islands is highly irregular. The upper surface of the shelf is marked by frequent rises supporting coral reefs and depressions known as passages and straits. The archipelago consists of about 500 islands, islets and rocky outcrops, having a total geographical area of 8249 sq. km. surrounded by coral reefs, rocky areas and mangrove swamps. The coastline of this Union Territory extends to 1962 km. which is 1/4th of mainland India. The Exclusive Economic zone (EEZ) is about 0.6 million sq. km. which is 30% of total EEZ of India. The coast line supports the most beautiful coral reef fishes and several groups of fishes of commercial importance. Fish are valuable sources of high-grade protein and other organic products. They occupy a significant position in the Socio-Economic fabric of the Andaman and Nicobar Islands by providing the population not only the nutritious food but also income and employment opportunities.

The Andaman and Nicobar fish fauna is an assemblage of about 1200 species depicting diverse characteristics. For harnessing these aquatic with respect to their morphological, biological distribution is imperative to back up their optimum exploitation. The Andaman and Nicobar Islands offer suitable habitats for groupers and snappers in the coral reefs, rocky shores and mangroves. They are among the most important benthic fishes of warm seas. These fishes are readily caught by hook and line. Much of the material has been collected by the author and supplemented fishermen's catch.

The Family Serranidae : Sub family Epinephelinae comprises 11 Genera and 137 species and the family Lutjanidae comprises 17 genera and 103 species of mostly reef dwelling marine fishes commonly known as Groupers and Snappers. They are mainly confined to tropical and subtropical marine waters. Groupers are of moderate to large size. The

giant Grouper, *Epinephelus lanceolatus* grows to about 2500 mm in total length and weighs upto 300 kg., others are moderately large measuring a maximum of 1m in length. Individuals of *Cephalopholis* species are generally small of which only *C. argus* and *C. sonnerati* recorder up to 480 mm. The juveniles of several species of *Lutjanus*, frequent the mangrove creeks. Groupers and Snappers are active predators. These fishes tend to occur at rather high levels in the trophic web. The distribution of most of these species seems most closely linked to suitable physical habitat, especially shelter. Hard bottom and high relief seem to be key elements, particularly for the Groupers. The diet accepted by most species seems broad enough to permit shifts in feeding, even between rather diverse prey group e.g., Pelagic fish, demersal fish, large or small benthic crustaceans and a variety of invertebrate. They are constitute the main focus of major commercial fisheries and an important component of the commercial catch in Andaman and Nicobar Islands. They are captured by a variety of methods which include handlines and various types of nets. They are common in the markets. They are generally considered good eating and are exported to various countries. Although highly esteemed as food, several species are sometimes implicated in cases of human fish poisoning (ciguatera), including those of the genera *Plectropomus*, *Variola* and the larger species of *Epinephelus* and among Snappers, *Lutjanus bohar*, *L. fulvus*, *L. gibbus*, *L. monostigma*. It is believed that *Lutjanus* fishes accumulate the responsible toxin by feeding on herbivorous fishes that eat a dinoflagellate found on dead coral or benthic algae.

The recent revisionary work of Randall and Heemstra (1991) accounted for 137 species of Groupers and G. R. Allen accounted for 103 species of Snappers presently known with as many as 110 species of Groupers and 67 species of Snappers from the Indo-Pacific region. The present taxonomic study revealed 43 species of Grouper and 42 species of Snappers presently known from Andaman and Nicobar Islands. They have been enumerated in Table I and II. It can further be seen from Table I and II, that Andaman and Nicobar Islands support about 39% of Indo-Pacific Grouper and 63% of Snapper and more than 31% Grouper and 40% of Snapper so far known to science. Among these the genus *Epinephelus* and *Lutjanus* is represented by a maximum number of 26 species each from these Islands.

Andaman and Nicobar Islands with as many as 43 species of Grouper and 42 species of Snapper fishes of commercial importance

appear to be one of the rich fishing grounds in the Indian Ocean.

They constitute a considerable portion of the commercial catch of food fishes in Andaman waters. There are good prospects for the cage culture of Groupers in sheltered bays with low value fish of the trawl catches as fish feed. Cage culture not only augments fish produce and economic returns, but also helps in maintaining the natural stocks at a sustainable level. There is need for study of their feeding biology and growth in cage for the development of their cage culture. This group is believed to be especially vulnerable to over exploitation both because of their protogynous reproduction system and their tendency to aggregate during spawning.

The primary purpose of this field guide specially designed for fish and fishery workers with the aim to provide accurate scientific identifications and some general notes of their distribution, habitat and fishery interest. It also provides valuable information for the proper management and exploitation of the grouper fish resources in a sustainable way.

Grouper and Snapper Fisheries

Fisheries are defined as any extractive activity that is targeted at the living marine resources of the country. Now fisheries are targeted at particular species for example the Grouper and Snapper fishery. Fishing for high valued species is a step forward towards rational exploitation of reef fish resources.

Grouper and Snapper are popular marine food fish of high market value in many part of the world and a few are currently being exported in frozen form to places out of India like United Kingdom, Singapore, Thailand, Malaysia, Hong Kong, Japan, China and Australia by the Andaman Fisheries Ltd. financed by the Andaman and Nicobar Islands Integrated Development Corporation (Table IV & V). At first Grouper fishing as live trade was concentrated in Islands of Ritchie's archipelago and Mayabunder (Middle Andaman). Fishing was carried out in fishing boats like rowing boats and mechanised boats. Two to three people go fishing in a rowing boats and 5-6 in mechanised boats. The usual fishing grounds are fringing reefs of the Islands. Handlines the most widely used gear for fish Groupers. Handlines are normally baited

with cut pieces of *Sadrinella* sp., *Thryssa* sp., *Selar* sp. and *Amblygaster sirm.* Daily catches of a rowing boat range 20-30 fish.

The Grouper catch is kept alive in small round nets attached to outside of the rowing boat in the sea. During the fish holding operation, which lasts from the moment of catch till transfer to cages (about 6-12 hours), the mortality constitutes about 10-30% of the catch. The groupers caught by the fishermen are sold live to exporter. These fish are stocked in cages for later live export.

RECOMMENDATIONS

When a fishery targets a single species, it is possible to overfish the species quickly in the locality where the fishery has first started. For this reason, it is important that concerned authority to be informed when starting a new commercial fishery, particularly a single species fishery. When the concern authority have this information at the very beginning of the fishery, the authorities can get ready to take management measures at the appropriate time. For example in shell fishery, few commercially important species like *Turbo* and *Trochus* have now become endangered. Informing and getting the authorities consent about new commercial fisheries can be made a prerequisite to starting new fisheries.

Imposing a system of limited entry in Grouper Capture

Improving reef fish catch and effort Data collection : It is recommended to collect fish statistics separately so that we know the contribution of reefs to fisheries with some accuracy. This information is important to fisheries, management and to decision making such as allocating a particular reef in a region for fishery. Two reasons for the lack of knowledge about Snapper and Grouper population dynamics are :-

1. Lack of appropriate empirical data and
2. Biological complexities of reef in general at both the ecosystem/ community and population species level.

Lack of attention to these barriers derives largely from the small

scale, artisanal nature of many of the fisheries for reef fishes. A number of data limitations, which create practical obstacles to stock assessment result directly from biological qualities of reef fish systems and species. Fisheries for reef fish have the following general attributes :-

1. Many species enter the catch.
2. Fishing effort is diffuse, unevenly distributed in space and often artisanal, employing a variety of gears and
3. Catch is often landed at many places.

Gear restriction : It has been shown that handline is the most effective gear for reef fishing in Andaman and Nicobar Islands. Traps, which break a considerable amount of corals during their operation.

Optimum hook sizes might be effective in reducing catches of undersized fish.

Improving co-ordination and co-operation : Improved co-ordination and co-operation among Ministries, Administration, Departments and Private Sectors.

Open and closed periods for grouper fishery : For effective management of grouper fishery few reef areas can be opened and closed on an alternating basis; when one region is open for fishery the other region can be closed for fishing at least for one year. During this crop-resting period, groupers will grow and reproduce.

Difficulties arise in monitoring then another alternative of the open and closed measures is to close the whole territory for grouper fishing for a definite period and reopen later.

As the opening and closing of an area depend on the intensity of fishing, fisherman themselves can regulate the duration of the open and closed periods.

Size restriction in grouper fishery : An extremely important factor affecting the success of a size limit in increasing yields is the degree of survival of undersized fish that are taken and released. For commercial use, the removal of Groupers less than the average maturity length of 12 inches from the medium size group and 16 inches from the large size group can be prohibited.

Marine reserves : How can protecting an area benefit fisheries (marine reserves)

- When protected from fishing mortality fish live longer and produce an exponentially increasing number of eggs as they grow in size. In a reserve there is rapid build up of fish biomass and increased size of target species under protection. Marine reserves spread the benefits of stock protection to fishing grounds by leakage. The vast majority of marine species possess a pelagic larval dispersal phase, which means that ocean currents can carry the progeny of protected stocks outside reserves to replenish fishing grounds. There is also emigration of adults and juveniles across reserve boundaries as stocks build up inside, providing a further benefit for fisheries.
- Marine reserves may be the only practical way of maintaining stocks of more vulnerable species (Sharks, Groupers).
- Aside from the fisheries perspective there is a second powerful argument for establishing marine reserves. Protection of habitat and species.

The need to conserve spawning stocks by some areas permanently closed to fishing to serve as reservoirs of spawning stock.

Aquaculture : Grouper aquaculture should be experimented with as a long term measure for increasing grouper production and as a tool for the management of the Grouper fishery.

This will be the one way of reducing the impact of the live reef food fish trade on grouper stocks is to encourage the expansion of Grouper farming. There is considerable room for expansion by means of culturing these fish. Taiwan and China has reportedly had some recent success in the hatchery raising of estuarine Groupers *Epinephelus coioides* and *E. malabaricus* commercially. In these Islands these two species can be raised in the hatchery. So in Grouper farming there should not rely on wild-caught juveniles. Removing juvenile Groupers from the wild to farm them would be robbing Peter (wild stocks) to pay Paul (aquaculture).

The capture method that will appear most ecologically and socially sustainable is that of using artificial habitats.

Although normally described as reef fishes, juveniles of both *E. coioides* and *E. malabaricus* settle in estuarine areas in and near mangroves. They move to coral reefs only after achieving a size of about 1 kg.

1. Encourage the farm production of groupers so as to help reduce the pressure of the live reef fish trade on wild stocks.
2. Investigate the biology of and fisheries for the juvenile reef fish species that can be caught for grow out, to fund such research.
3. The task would therefore be seen to fall logically to Governments, Aid Agencies and large NGO (Non-government Organisations).

MATERIAL AND METHODS

Groupers and Snappers are collected from Coral reefs, seagrass bed, rocky and mangrove habitats. Hook and line readily catch these fishes. Much of the material has been collected by the author and supplemented by fishermen's catch. The fishes were preserved in 10% buffered formaline and deposited in the collection of Zoological Survey of India, Port Blair.

All the fish collected were identified using identification keys and taxonomic books such as Day (1889), Jones & Kumaran (1980), Fischer and Bianchi (1984), Masuda *et al.* (1984), Talwar and Kacker (1984), Smith and Heemstra (1986), Allen, GR & JH Talbot (1985), Allen and Steene (1987) and Randall and Heemstra (1991).

TABLE - I

Analysis of genera and species of Groupers present in Andaman and Nicobar Islands in relation to those of the world and Indo-Pacific region

Genera	Species		
	World	Indo-Pacific	Andaman and Nicobar Islands
<i>Aethaloperca</i>	1 sp.	1 sp.	1 sp.
<i>Anyperodon</i>	1 sp.	1 sp.	1 sp.
<i>Cephalopholis</i>	22 sp.	17 sp.	9 sp.
<i>Cromileptes</i>	1 sp.	1 sp.	1 sp.
<i>Dermatolepsis</i>	3 sp.	1 sp.	-
<i>Epinephelus</i>	97 sp.	77 sp.	26 sp.
<i>Gracila</i>	1 sp.	1 sp.	-
<i>Plectropomus</i>	7 sp.	7 sp.	3 sp.
<i>Saloptia</i>	1 sp.	1 sp.	-
<i>Triso</i>	1 sp.	1 sp.	-
<i>Variola</i>	2 sp.	2 sp.	2 sp.
Total : 11	137 sp.	110 sp.	43 sp.

TABLE - II

Analysis of genera and species of Snappers present in Andaman and Nicobar Islands in relation to those of the World and Indo-Pacific region

Genera	Species		
	World	Indo-Pacific	Andaman and Nicobar Islands
<i>Aphareus</i>	2	2	2
<i>Aprion</i>	1	1	1
<i>Apsilus</i>	2	-	-
<i>Etelis</i>	4	3	3
<i>Hoplopagrus</i>	1	1	-
<i>Lipocheilus</i>	1	1	1
<i>Lutjanus</i>	65	39	26
<i>Macolor</i>	2	2	1
<i>Ocyurus</i>	1	-	-
<i>Paracaesio</i>	6	5	2
<i>Parapristipomoides</i>	1	-	-
<i>Pinjalo</i>	2	2	2
<i>Pristipomoides</i>	11	8	4
<i>Randallichthys</i>	1	1	-
<i>Rhomboplites</i>	1	-	-
<i>Symphorichthys</i>	1	1	-
<i>Symphorus</i>	1	1	-
Total : 17	103	67	42

TABLE - III

Groupers of Andaman and Nicobar Islands

Sl. No.	Species	Max. total length caught during survey, mm	Max. total length reported in literature, mm
1.	<i>Aethalopera rogae</i> (Forsskal) MS	410	600
2.	<i>Anyperodon leucogrammicus</i> (Val.) MS	380	520
3.	<i>Cephalopholis argus</i> Bloch & Schn. MS	400	600
4.	<i>Cephalopholis boenak</i> (Bloch) SS	150	258
5.	<i>Cephalopholis cyanostigma</i> (Val.) MS	199	350
6.	<i>Cephalopholis formosa</i> (Shaw & Nodder) MS	210	340
7.	<i>Cephalopholis leopardus</i> (Lacepede) SS	109	185
8.	<i>Cephalopholis microprion</i> (Bleeker) SS	250	230
9.	<i>Cephalopholis miniata</i> (Forsskal) MS	280	410
10.	<i>Cephalopholis sonnerati</i> (Val.) MS	280	570
11.	<i>Cephalopholis urodeta</i> (Forster) SS	135	265

Table - III (contd.)

Sl. No.	Species	Max. total length caught during survey, mm	Max. total length reported in literature, mm
12.	<i>Cromileptes altivelis</i> (Val.) MS	93	660
13.	<i>Epinephelus areolatus</i> (Forsskal) MS	422	395
14.	<i>Epinephelus bleekeri</i> (Vaillant) LS	230	760
15.	<i>Epinephelus caeruleopunctatus</i> (Blotch) LS	250	760
16.	<i>Epinephelus chlorostigma</i> (Val.) LS	410	750
17.	<i>Epinephelus coioides</i> (Hamilton) LS	252	945
18.	<i>Epinephelus corallicola</i> (Val.) MS	194	490
19.	<i>Epinephelus erythrurus</i> (Val.) MS	285	430
20.	<i>Epinephelus fasciatus</i> (Forsskal) MS	220	400
21.	<i>Epinephelus faveatus</i> (Val.) SS	209	317
22.	<i>Epinephelus flavocaeruleus</i> (Lacepede) LS	260	900
23.	<i>Epinephelus fuscoguttatus</i> (Forsskal) LS	325	885

Table - III (contd.)

Sl. No.	Species	Max. total length caught during survey, mm	Max. total length reported in literature, mm
24.	<i>Epinephelus hexagonatus</i> (Forster) SS	160	254
25.	<i>Epinephelus lanceolatus</i> (Bloch) ELS	590	2500
26.	<i>Epinephelus longispinis</i> (Kner) MS	292	545
27.	<i>Epinephelus macrospilos</i> (Bleeker) LS	245	510
28.	<i>Epinephelus malabaricus</i> (Bloch & Schn.) LS	310	885
29.	<i>Epinephelus melanostigma</i> Schultz SS	107	328
30.	<i>Epinephelus merra</i> Bloch MS	225	310
31.	<i>Epinephelus miliaris</i> (Val.) MS	430	525
32.	<i>Epinephelus ongus</i> (Bloch) MS	270	305
33.	<i>Epinephelus polyphekadion</i> (Bleeker) LS	277	750
34.	<i>Epinephelus polystigma</i> (Bleeker) MS	355	480
35.	<i>Epinephelus quoyanus</i> (Val.) MS	245	390

Table - III (contd.)

Sl. No.	Species	Max. total length caught during survey, mm	Max. total length reported in literature, mm
36.	<i>Epinephelus spilotoceps</i> Schultz SS	189	312
37	<i>Epinephelus tauvina</i> (Forsskal) LS	185	750
38.	<i>Epinephelus undulosus</i> (Quoy & Gaid.) LS	168	750
39.	<i>Plectropomus areolatus</i> (Ruppell) LS	374	730
40.	<i>Plectropomus maculatus</i> (Bloch) LS	345	700
41.	<i>Plectropomus pessuliferus</i> (Fowler) LS	380	630
42.	<i>Variola albimarginata</i> Baissac MS	320	470
43.	<i>Variola louti</i> (Forsskal) LS	267	810

SS : Small Size, MS : Medium Size,
 LS : Large Size, ESL : Extra Large Size

Table IV
Sale of Snapper fish by Andaman Fisheries Ltd.
Port Blair from 1996 to 1999

1996

	Fish whole & Round		Fish Fillets		Fish Gut & Gudded
	Qty (kg)	Value (Rs.)	Qty (kg)	Value (Rs.)	
1. Direct export	-	-	-	-	-
2. Export through Merchant Exporter	2717	10422	-	-	-
DTA Sales	12575	366567	5910	329700	-

Total Qty (kg) : 21202, Value (Rs.) : 1738555

1997

	Fish whole & Round		Fish Fillets		Fish Gut & Gudded
	Qty (kg)	Value (Rs.)	Qty (kg)	Value (Rs.)	
1. Direct export	19575	964042	-	-	-
2. Export through Merchant Exporter	59967	2208472	-	-	-
DTA Sales	30425	1094992	750	70000	

Total Qty (kg) : 110717, Value (Rs.) : 4337506

Table IV (contd.)

1998

	Fish whole & Round		Fish Fillets		Fish Gut & Gudded
	Qty (kg)	Value (Rs.)	Qty (kg)	Value (Rs.)	-
1. Direct export	3315	210315	11240	1719674	-
2. Export through Merchant Exporter	37319	1746114	-	-	-
DTA Sales	2017	50437	-	-	-

Total Qty (kg) : 53891, Value (Rs.) : 3726540

1999

	Fish whole & Round		Fish Fillets		Fish Gut & Gudded	
	Qty (kg)	Value (Rs.)	Qty (kg)	Value (Rs.)	Qty (kg)	Value (Rs.)
1. Direct export	6870	375115	5080	807963	13745	581413
2. Export through Merchant Exporter	-	-	-	-	-	-
DTA Sales	250	10500	500	35000	-	-

Total Qty (kg) : 26445, Value (Rs.) : 1809991

Table V
Sale of Grouper fish by Andaman Fisheries Ltd.
Port Blair from 1996 to 1999

1996

	Fish whole & Round		Fish Fillets		Fish Gut & Gudded	
	Qty (kg)	Value (Rs.)	Qty (kg)	Value (Rs.)	Qty	Value (Rs.)
1. Direct export	-	-	-	-	-	-
2. Export through Merchant Exporter	-	-	-	-	-	-
DTA Sales	825	34650	135	9450	-	-

Total Qty (kg) : 960, Value (Rs.) : 44100

1997

	Fish whole & Round		Fish Fillets		Fish Gut & Gudded	
	Qty (kg)	Value (Rs.)	Qty (kg)	Value (Rs.)	Qty	Value (Rs.)
1. Direct export	8860	383130	-	-	-	-
2. Export through Merchant Exporter	11365	405215	-	-	-	-
DTA Sales	6850	263613	105	6825	-	-

Total Qty (kg) : 27180, Value (Rs.) : 1058783

Table - V (contd.)

1998

	Fish whole & Round		Fish Fillets		Fish Gut & Gudded	
	Qty (kg)	Value (Rs.)	Qty (kg)	Value (Rs.)	Qty	Value (Rs.)
1. Direct export	855	54250	5410	837967	126	32571
2. Export through Merchant Exporter	-	-	-	-	-	-
DTA Sales	-	-	1500	97500	-	-

Total Qty (kg) : 7891, Value (Rs.) : 102288

1999

	Fish whole & Round		Fish Fillets		Fish Gut & Gudded	
	Qty (kg)	Value (Rs.)	Qty (kg)	Value (Rs.)	Qty (kg)	Value (Rs.)
1. Direct export	1130	39211	1080	168117	5184	326587
2. Export through Merchant Exporter	-	-	-	-	-	-
DTA Sales	-	-	3423	199933	-	-

Total Qty (kg) : 10817, Value (Rs.) : 733848

DTA = Domestic Tarrif Area (within country)

SYSTEMATICS

GROUPERS

Subfamily : EPINEPHELINAE

Body oblong to moderately elongate; mouth large, oblique, the lower jaw usually protruding; maxilla fully exposed on cheek when mouth closed; supramaxilla present; inner teeth on jaws depressible; no teeth on tongue; dorsal fin undivided, with vii-xi spines and 10-21 soft rays; anal fin with 7-10 soft rays; caudal fin emarginate to rounded (except lunate in *Variola*) with 15 branched rays; soft dorsal, caudal and anal fins scaly.

The Epinephelinae (Rockcods or Groupers) are generally demersal fishes of tropical and subtropical seas, ranging from shallow coastal waters to moderate depths. Some species prefer seagrass beds and mud or sandy bottoms, but most are fishes of coral reefs and rocky bottoms. Most of the rockcods appear to protogynous hermaphrodites, beginning life as a females and then later changing sex to spawn as males.

Key to genera

- 1a. Dorsal VII-VIII, 10-11; vertical edge of preopercle smooth, lower edge with 3 or 4 large antrorse spines. PLECTROPOMUS
- 1b. Dorsal IX-X, 13-19; vertical edge of preopercle serrate, the lower edge without large antrorse spines. 2
- 2a. Rear nostril a long vertical slit; head profile of adults markedly concave; Dorsal spines x. CROMILEPTES
- 2b. Rear nostril round or oblong; head profile of adults straight or convex; dorsal spines ix or xi. 3
- 3a. Caudal lunate, with lobes produced in adults; Gill rakers all rudimentary; dorsal IX, 13-14. VARIOLA
- 3b. Caudal truncate, emarginate or rounded; Gill rakers not all rudimentary. 4
- 4a. No teeth on palatines; body elongate, compressed, the depth 3.3-3.7 in SL. ANYPERODON
- 4b. Palatines with teeth; body depth 2.1-3.8 in SL. 5

- 5a. Body depth 2.1-2.5 in SL; pectoral asymmetric, the 5th or 6th rays longest; caudal truncate; Dorsal IX, 17-18. AETHALOPERCA
- 5b. Body depth 2.3-3.8 in SL; pectoral rounded, the middle rays longest; caudal emarginate to rounded, truncate in a few species; Dorsal spines ix or xi. 6
- 6a. Dorsal rays IX, 13-17; maxilla of adults with a distinct ventrally projecting knob. CEPHALOPHOLIS
- 6b. Dorsal rays IX, 12-19; maxilla without ventrally projecting knob. EPINEPHELUS

Genus *Aethaloperca* Fowler

1904. *Aethaloperca* Fowler, *Jour Acad. Nat. Sci. Phila*; Ser. 2 : 522.

Type species : *Perca rogga* Forsskal.

Body Depth greater than head length, 2.1-2.5 in SL; body with 2.25-2.8 in depth. Dorsal profile of head straight, becoming convex on nape, monotypic.

Genus *Anyperodon* Gunther

1859. *Anyperodon* Gunther, *Cat. Fishes Br. Mus.*, 1 : 95.

Type species : *Serranus leucogrammicus* Valenciennes.

Body elongate and compressed, the depth 3.3-3.7 in SL; head distinctly longer than body depth. No teeth on palatines; 2 rows of teeth at side of lower jaw. One species.

Genus *Cephalopholis* Bloch and Schneider

1801. *Cephalopholis* Bloch and Schneider, *Syst. Ichth. Bloch* 311.

Type species : *Cephalopholis argus* Bloch and Schneider.

Body depth 2.3-3.2, head 2.3-2.8 in SL. Dorsal spines ix, the membranes distinctly indented between the spines; caudal rounded; middle pectoral rays longest. Preopercle serrate, without antrorse spines ventrally.

A worldwide genus of at least 22 species of which 9 species occur in these islands.

Key to the species of *Cephalopholis*

- 1a. Anal soft rays 8 (rarely 7 or 9); Scales on abdomen ctenoid; ground colour brown to dark brown. 2
- 1b. Anal soft rays 9 (rarely 8 or 10); scales on abdomen cycloid; ground colour primarily red or reddish yellow (except *C. argus*).
5
- 2a. Small dark spots or dark-edged pale spots (blue in life) on head and at least anteriorly on body. 3
- 2b. No small dark spots or dark-edged pale spots on head or body.
4
- 3a. Dorsal soft rays usually 15; longitudinal scale series 84-98; dark-edged blue spots present only on head and anterior body; no large pale spots on body; pectoral fins dark brown. *microprion*
- 3b. Dorsal soft rays usually 16; longitudinal scale series 93-106; dark-edged blue spots on head, body, and at least basally on median fins; body of adults usually with pale spots larger than pupil which form irregular bars; pectoral fins of adults with a blackish margin and broad orange submarginal zone. *cyanostigma*
- 4a. Pectoral fins short, 1.55-1.8 in head; brown with narrow blue stripes on head, body and fins; no dark brown bands on head; no white margin on median fins. *formosa*
- 4b. Pectoral fins 1.3-1.6 in head; brown without blue stripes on head, body or fins, the body with 8 or 9 slightly irregular dark brown bars (may be lost in preservative); head usually with dark brown bands radiating from eye; a bluish white margin posteriorly on caudal fin variably present on soft portion of dorsal and anal fins.
..... *boenak*
- 5a. Dorsal soft rays 16 or 17; lower-limb gill rakers 17-19; auxillary scales present on body; dark brown with numerous dark-edged blue spots on head, body and fins in life; 5 or 6 broad pale bars often present on posterior half of body. *argus*
- 5b. Dorsal soft rays usually 14 or 15; lower-limb gill rakers 13-18;

- auxillary scales not present on body; colour not as in 5a. 6
- 6a. Lateral-line scales 66-80; longitudinal scale series 115-134; pectoral rays 18-20; body relatively deep, the depth 2.3-2.75 in SL; red to reddish brown in life with widely scattered small whitish blotches. *sonnerati*
- 6b. Lateral-line scales 46-68; longitudinal scale series 79-121; pectoral rays 16-19; body not deep, the depth 2.6-3.5 in SL; colour not as in 6a. 7
- 7a. Lateral-line scales 54-68; caudal fin blackish without white bands; pectoral fins blackish. *urodeta*
- 7b. Lateral-line scales 45-56; colour not as in 7a. 8
- 8a. Longitudinal scale series 79-88; head relatively long 2.15-2.4 in SL; a dark brown saddle-like spot anterodorsally on caudal peduncle, followed by a second smaller spot; a diagonal dark streak dorsoposteriorly on caudal fin. *leopardus*
- 8b. Longitudinal scale series 90-121; head 2.45-2.65 in SL; numerous small dark-edged blue spots on head, body and fins in life; no dark brown blotches on back or caudal peduncle. *miniata*

Genus *Epinephelus* Bloch

1793. *Epinephelus* Bloch, *Naturges Ausland. Fische*, 6 : 11.

Type species : *Epinephelus marginalis* Bloch.

Body oblong to oval, but not strongly compressed, the depth 2.6-3.8 in SL. Caudal rounded to slightly emarginate; Dorsal XI, 12-19; Anal III, 7-10. Preopercle distinctly serrate, but no large antrorse spines on ventral edge. Jaws with rows of small depressible teeth and a few small canines at the front; vomer and palatines with distinct teeth; tongue without teeth.

A worldwide genus of about 97 species, there are about 26 species occur in these islands.

Key to species of *Epinephelus*

- 1a. Caudal fin emarginate to truncate, at least in adults. 2
- 1b. Caudal fin rounded. 6

- 2a. Gill rakers elongate, not rudimentary, 12-16 + 20-23; dorsal soft rays 17-19; purplish to brownish gray with yellowish brown dots on head and slightly wavy longitudinal brown lines on upper body (lines usually lost on large adults). *undulosus*
- 2b. Gill rakers notably elongate and rudiments often present, 6-11 + 13-18; dorsal soft rays 15-17; colour not as in 2a. 3
- 3a. Colour in life deep blue without black spots, the caudal peduncle and fins bright yellow (large adults lose yellow coloration and become nearly black). *flavocaeruleus*
- 3b. Colour not as in 3a. (numerous dark or white spots present).
..... 4
- 4a. Caudal fin truncate to slightly rounded; body moderately elongate, the depth 3.0-3.5 in SL; head, body, dorsal fin and upper third of caudal fin with small orange-yellow spots, the lower two-thirds of caudal dark purplish gray; dorsal soft rays modally 17.
..... *bleekeri*
- 4b. Caudal fin slightly emarginate; body less elongate on the average, the depth 2.7-3.35 in SL; spots on head, body and fins yellow to dark brown, the caudal entirely spotted; dorsal soft rays modally 16 (except *chlorostigma* with 17). 5
- 5a. Dorsal soft rays usually 16, outer margin of anal fin of adults rounded to slightly angular, the longest ray 2.0-2.6 in head; pectoral fins relatively long, 1.6-1.85 in head; lower-limb gill rakers usually 15; dark spots on body of adults subsequential to pupil. *areolatus*
- 5b. Dorsal soft rays usually 17; outer margin of anal fin of adults angular (pointed), the longest ray 1.9-2.35 in head; pectoral fins not long, 1.7-1.95 in head; lower-limb gill rakers usually 16 or 17; large dark spots on body of adults distinctly small than pupil. .
..... *chlorostigma*
- 6a. Lateral-line scales with branched tubules; eyes very small; maximum total length about 2700 mm; juveniles yellow with 3 broad black bars on body and irregular broad black bands on head. *lanceolatus*
- 6b. Lateral-line scales with a single tubule (except anterior scales of large *coioides* and *malabaricus*; eye not very small; maximum total

- length less than 1500 mm; juveniles not coloured as in 6a. 7
- 7a. Lateral-line scales 46-53. 8
- 7b. Lateral-line scales 55-74 (except *fuscoguttatus*, *ongus* & *polystigma* with 50-58). 25
- 8a. Dorsal rays usually 17; dark spots present on pectoral fins, progressively smaller distally; pelvic fins short, 2.2-2.6 in head. *faveatus*
- 8b. Dorsal rays usually 16; no dark spots on pectoral fins or present only basally; pelvic fins not short, 1.85-2.35 in head. 9
- 9a. Scales on body cycloid, at least on adults (may be ctenoid in area covered by pectoral fins) dark spots on head, body and fins less numerous; body robust; lower jaw strongly projecting. *macrospilos*
- 9b. Scales on body largely ctenoid (mainly cycloid on large adults of *tauvina*). 10
- 10a. Dark spots on body diagonally elongate and much more numerous posteriorly; dark spots on head scattered. *longispinis*
- 10b. Dark spots on body not diagonally elongate and not more numerous posteriorly; dark spots on head close-set. 11
- 11a. Pectoral fins relatively long; dorsal soft rays 16-18; serrae of corner of prepercle very large; 2 oblique dark brown band on thorax. ... *quoyanus*
- 11b. Pectoral fins not long; dorsal soft rays 14-17; serrae at corner of prepercle slightly to moderately enlarged; dark spots on head and body extending ventrally and most within a spot diameter of adjacent spots. 12
- 12a. Dorsal soft rays 14-15; dorsal spines not long; a large black saddle-like spot on caudal peduncle; head and body densely covered by small dark brown spots with large irregular brown blotches, some of which may be interconnected. *polyphekadion*
- 12b. Dorsal soft rays 15-18; dorsal spines long; colour not as 12a (especially, no black saddle on caudal peduncle). 13

- 13a. Spots on head and body small (about half pupil diameter) and brownish yellow; dark brown to black spots on fins (except spinous portion of dorsal) much larger than those on head and body; maxilla not reaching a vertical at rear edge of orbit.
..... *miliaris*
- 13b. Spots on head and body not small, those on body larger than pupil diameter and dark brown to black; dark spots on fins smaller than those on body; maxilla usually reaching or extending posterior to a vertical at rear edge of orbit. 14
- 14a. Pectoral rays usually 17; dorsal spines not long, the longest 2.55-2.9 in head; gill rakers modally 23; a few dark brown spots on body usually joined to form short horizontal or oblique bands; black spots on pectoral fins very small over all of fins and largely confined to rays. *meraa*
- 14b. Pectoral rays usually 18; dorsal spines long, the longest 2.05-2.6 in head; gill rakers modally 24 or 25; no dark spots on body confluent; black spots on pectoral fins not uniformly small and not confined to rays. 15
- 15a. Most dark spots on body polygonal and close-set, only narrow pale lines (forming a reticulum) or white dots separating, individual spots; scales ctenoid. 16
- 15b. Most dark spots on body round or oblong and well-separated; scales ctenoid or cycloid. 18
- 16a. Second anal spine relatively long; dorsal soft rays usually 16; polygonal dark spots on body merging on sides of spots, separated mainly by a white dot at each angular corner; a large yellow-brown blotch behind eye, sometimes linked to but usually separate from another horizontally elongate spot of same colour on opercle.
..... *hexagonatus*
- 16b. Second anal spine not long; dorsal soft rays usually 15; polygonal dark spots on body fully separated by a network of pale lines, no large yellow-brown spot behind eye or on opercle. 17
- 17a. A single large black blotch on back at rear base of spinous portion

of dorsal fin which extends onto fin about half distance to margin; small dark spots at front of upper lip, at most 2 irregular horizontal rows; gill rakers 24-28, modally 26.....*melanostigma*

- 17b. Three or four large black blotches (or groups of dark spots darker than others) along base of dorsal fin, and 1 dorsally on caudal peduncle, the largest at base of last few dorsal spines, but not extending half way to fin margin; small dark spots at front of upper lip in 3 or 4 irregular horizontal rows; gill rakers 23-27, modally 25. *spilotoceps*
- 18a. Dorsal soft rays usually 14; gill rakers 28-31; lateral line scales 53-58; light yellowish brown with large irregular dark brown spots on head and body, a saddle-like black spot on caudal peduncle and numerous small close-set dark brown spots on head, body and fins; scales cycloid (ctenoid in juveniles). *fuscoguttatus*
- 18b. Dorsal soft rays usually 15 or 16; gill rakers 22-29; lateral line scales 53-74; colour not as in 18a; scales ctenoid (except large tauvina which have cycloid scales except midside of body, especially anteriorly). 19
- 19a. Dorsal soft rays usually 16; posterior nostril vertically elongate and narrow, 2-3 times diameter of anterior nostril; longitudinal scale series 88-109; gray with widely scattered black spots smaller than pupil on head, body and fins; 3 dusky to blackish blotches on back at base of posterior half of dorsal fin and a saddle-like dusky to blackish spot on caudal peduncle. *corallicola*
- 19b. Dorsal soft rays usually 15; nostrils subequal or posterior nostril enlarged (but not more than twice diameter of anterior nostril) and not vertically elongate; longitudinal scale series 95-130; colour not as in 19a. 20
- 20a. Lateral line scales 54-65, the anterior scales of large adults with branched tubules; body with 5 slightly oblique dark bars which tend to bifurcate ventrally (bars may be faint or broken into series of 2 or 3 large blotches). 21
- 20b. Lateral-line scales 62-74, none with branched tubules; faint oblique dark bars sometimes present on body. 22
- 21a. Spots on head and body black and small, scattered small pale

spots, usually present on head and body; pectoral-rays modally 19; large adults with 4 or 5 rows of teeth on midside of lower jaw. *malabaricus*

21b. Spots on head and body brownish orange to reddish brown and moderate in size; no small pale spots on head and body; pectoral rays modally 20; adults with 2 or 3 rows of teeth on midside of lower jaw. *coioides*

22a. Head large and pointed; head, body and fins with Orange-red to dark brown spots; faint oblique dark bars sometimes present (spots within these bars darker); a large blackish blotch often present at base of last 4 dorsal spines and extending into lower part of fin. *tauvina*

22b. Head not large and pointed; body dark brown, no distinct dark spots over most of head and body. 23

23a. Membranes of spinous portion of dorsal fin not or only slightly incised; body dark brown, often with large irregular pale blotches, thus restricting dark ground colour to a reticulum; 1 or 2 dark streaks on cheek and operculum, the lower most from lower edge of eye to just above corner of preopercle. *erythrurus*

23b. Membranes of spinous portion of dorsal fin incised; colour not as in 23a. 24

24a. Outer triangular part of each membrane of spinous portion of dorsal fin black; edge of orbit narrowly black, surrounded by a light blue line; 5 faint dark bars usually present on body, often containing irregular pale spots. *fasciatus*

24b. Outer triangular part of membranes of spinous portion of dorsal fin not black; rim of orbit not black; brownish gray with numerous small whitish spots and scattered large whitish blotches (nearly as large as eye) on postorbital head, body and dorsal fin; a series of dark blotches along back. *caeruleopunctatus*

25a. Longitudinal scale series 81-91; snout short; dark brown, the head, body and fins except pelvics with numerous whitish dots (may not persist in preservative); posterior margins of median and pectoral fins narrowly orange-red. *polystigma*

- 25b. Longitudinal scale series 95-110; snout not short; gray-brown with numerous small whitish spots on adults tend to coalesce to form irregular longitudinal bands; paired fins of adults without whitish spots; lacks narrow red margin on its fins. *ongus*

Genus *Plectropomus* Oken

1817. *Plectropomus* Oken, *Fische. Isis* 8(148) : 1182.

Type species : *Bodianus maculatus* Bloch.

Body elongate, the depth 2.9-3.8 in SL; dorsal VII-VIII, 10-11; Anal III, 8; caudal emarginate to truncate; paired fins short; middle pectoral rays longest; a pair of large canines at front of jaws and 1-4 fixed canines on rear half of lower jaw; preopercle rounded, the lower edge with 3 or 4 large antrose spines.

Large, active reef fishes. About 7 species; 3 species in these islands.

Key to the species of *Plectropomus*

- 1a. Caudal fin truncate to slightly emarginate, the caudal concavity contained 13 or more times in head length; small embedded scales in interorbital space; head and body of adults with numerous relatively large round (rarely slightly oval) dark-edged blue spots; blue spots present on lower abdomen. *areolatus*
- 1b. Caudal fin emarginate, the caudal concavity 4.6-12.0 in head length; no embedded scales in interorbital space; blue spots on head and body of moderate size, the largest on body half pupil diameter or larger; some spots on head and anterior body elongate (except juveniles). 2
- 2a. Pelvic fins without blue spots; some spots anteriorly on side of body of adults horizontally elongate; gill raker at angle of first gill arch longer than longest gill filaments at angle; pelvic fins 1.7-2.1 in head; nostrils subequal. *maculatus*
- 2b. Pelvic fins with blue spots; some spots on side of body of adults vertically elongate; gill raker at angle of first gill arch shorter than longest gill filaments at angle; pelvic fins 1.9-2.35 in head; posterior nostril of large adults distinctly larger than anterior nostril.
..... *pessuliferus*

Genus *Variola* Swainson

1839. *Variola* Swainson, *Natural History Animals, Fishes*, 2 : 202.

Type species *Variola longipinna* Swainson.

Body smooth and highly ornate, body depth 2.8-3.2 in SL. Caudal fin strongly lunate, the upper and lower rays markedly elongate; Dorsal IX, 13-15; Anal III, 8; rear end of dorsal and anal pointed; Anal spines distinct; preopercle rounded, finely serrate, without spines on ventral edge; body scales mostly ctenoid, no auxiliary scales; side of lower jaw with 1 or 2 fixed canines.

Active coral-reef fishes. 2 species, both are in these islands.

Key to the species of *Variola*

- 1a. Caudal fin with a white line centroposteriorly, preceded by a black submarginal line; dorsal and pectoral fins without distinct yellow posterior borders; lower limb gill rakers 13-16; pelvic fins usually not reaching anus; juveniles without a dark stripe on upper side and without a dark spot at upper base of caudal fin.
 *albimarginata*
- 1b. Caudal fin with a broad yellow posterior margin; dorsal, anal and pectoral fins with broad yellow posterior margins; lower-limb gill rakers 15-18; pelvic fins reaching beyond anus; juvenils with an irregular dark brown stripe on upper side and an irregular dark brown spot as large as eye at upper base of caudal fin. *louti*

SNAPPERS

Family : LUTJANIDAE

Body moderately elongate to deep and covered with ctenoid scales; snout, preorbital and lower jaw naked; mouth terminal; upper jaw usually moderately protractile (fixed in *Aphareus*), maxilla slips beneath preorbital when mouth closed; jaws with more or less distinct canines (absent in *Aphareus*), vomer and palatines usually with small conical teeth (toothless in *Aphareus*); dorsal fin single or with a shallow notch; caudal fin truncate to deeply forked.

Snappers are active predators feeding mainly at night on fishes, crustaceans and cephalopods. Adults mostly bottom associated fishes occurring in warm seas throughout the world. This family composed of 17 genera and 103 species of which 8 genera and 42 species are known from Andaman & Nicobar Islands.

Key to genera

- 1a. Dorsal and anal without scales; D X, 10 or 11..... 2
- 1b. Soft dorsal and anal with scales; D X-XIII, 12-16..... 7
- 2a. Dorsal fin deeply notched between spinous and soft portions. ..
..... ETELIS
- 2b. Dorsal fin not deeply notched between spinous and soft portions.
..... 3
- 3a. Upper jaw not protrusible, attached at symphysis by a frenum to skull; vomer and palatines without teeth; teeth in jaws minute..
..... APHAREUS
- 3b. Upper jaw protrusible, not attached by frenum to skull; vomer and palatines with teeth; at least some teeth in jaws caniniform.....4
- 4a. Upper lip with a medium fleshy protuberance, especilly well developed in adults; dorsal spines thick, robust.
..... LIPOCHEILUS
- 4b. Upper lip without a fleshy protuberance, mouth smaller; dorsal spines relatively feeble to moderately developed. 5

- 5a. Last dorsal and anal rays shorter than penultimate ray; D X, 10.
..... PARACAESIO
- 5b. Last dorsal and anal rays longer than penultimate ray; D X, 11.
..... 6
- 6a. Groove present on snout below nostrils; pectoral shorter than half
length of head. APRION
- 6b. No groove on snout; pectoral longer than half length of head. ..
..... PRISTIPOMOIDES
- 7a. Gill raker long, slender, 60 or more on lower limb of 1st gill arch.
..... MACOLOR
- 7b. Gill raker short, 7-19 on lower limb of 1st gill arch. 8
- 8a. Mouth rather small, somewhat upturned; no caniniform teeth in
jaws. PINJALO
- 8b. Mouth larger, not upturned; some caniniform teeth in jaws.
..... LUTJANUS

Genus *Aphareus* Cuvier

1830. *Aphareus* Cuvier, *Hist. nat. poisson* : 485.

Type species : *Aphareus caeruleus* Cuvier (in C.V.).

Medium size snapper with elongate, fusiform body, somewhat robust; teeth in jaws minute, no canines, vomerine teeth absent; premaxillae not protractile; anal fin with 3 spines and 8 soft rays; caudal fin forked. Two species : both in Andaman and Nicobar Islands.

Key to the species of *Aphareus*

- 1a. Gill rakers on 1st arch (6-10) + (16-18); colour steel blue.....
..... *A. furca*
- 1b. Gill rakers on 1st arch (16-19) + (30-34); colour brick red or pink
dorsally. *A. rutilans*

Genus *Aprion* Valenciennes

1830. *Aprion* Valenciennes, *Hist. nat. poissons* : 543.

Type species : *Aprion virescens* Valenciennes (in C. V.).

Interorbital naked, flat, jaws with distinct canines. A single species in the genus.

Genus *Etelis* Cuvier

1828. *Etelis* Cuvier (in C. V.), *Hist. nat. poissons* : 127.

Type species : *Etelis carbunculus* Curvier (in C. V.).

Medium sized snappers with slender, fusiform bodies; teeth in jaws small, conical; dorsal fin deeply notched; caudal fin forked. Four species, three in Andaman and Nicobar Islands,

Key to the species of *Etelis*

- 1a. Total gill rakers on 1st gill arch 17-22 including rudiments; upper lobe of caudal fin short. *E. carbunculus*
- 1b. Total gill rakers on 1st gill arch 23 or more including rudiments upper lobe of caudal fin longer. 2
- 2a. Total gill rakers on 1st gill arch 33-36; predorsal scales 17-19. ..
..... *E. radiusus*
- 2b. Total gill rakers in 1st gill arch 23-28; predorsal scales 13-17. ...
..... *E. coruscans*

Genus *Lipocheilus* Anderson, Talwar & Johnson

1997. *Lipocheilus* Anderson, Talwar & Johnson, *Proc. Biol. Soc. Wash*; 89(49) : 510.

Type species : *Tangia carnolabrum* chan.

A single species in the genus.

Genus *Lutjanus* Bloch

1790. *Lutjanus* Bloch, *Naturges Ausland Fische* : 108.

Type species : *Lutjanus lutjanus* Bloch).

Small to large sized snappers with compressed, moderately deep to slender bodies; mouth relatively large, protractile; jaws with several enlarged canine teeth. The larger species are good eating and are

important market fishes throughout the tropics.

About 65 species (Indo-West Pacific 39. Eastern Pacific 9. Western Atlantic 12; Eastern Atlantic 5) 26 species known from Andaman and Nicobar Islands.

Key to the species of *Lutjanus*

- 1a. Preorbital space very narrow; body slender, dorsal spines usually XI, occasionally X or rarely XII, soft dorsal rays 12. 2
- 1b. Preorbital space wider; body deeper; dorsal spines variable X to XII; Soft dorsal rays occasionally 12, usually 13 or more. 3
- 2a. Body depth 3.5 to 3.8 times in standard length, tongue smooth without teeth; a dark band from snout to caudal fin base and two pearly spots above lateral line. *L. biguttatus*
- 2b. Body depth 2.9 to 3.3 times in standard length, tongue with a patch of fine granular teeth; colour sivery white with a broad yellow stripe along middle of side to caudal fin base and narrow yellowish lines corresponding with longitudinal scale rows.
..... *L. lutjanus*
- 3a. Body yellow with a series of 4-8 longitudinal blue stripes on side. 4
- 3b. Colour not as in 3a. 6
- 4a. Dorsal spines XI or XII; black spot absent; upper most stripes more or less parallel to body axis or slanting toward dorsal profile; gill rakers on lower limb of 1st gill arch 17 to 19, total rakers 26 to 28. *L. bengalensis*
- 4b. Dorsal spines X; a large black spot usually present. 5
- 5a. Four stripes on side, belly whitish with thin grey lines; scale rows on cheek 5 or 6; upper pectoral rays darkish. *L. kasmira*
- 5b. Five stripes on side, belly not whitish and without thin lines; scale raws on cheek 10 of 11; upper pectoral rays pale.
..... *L. quinquelineatus*

- 6a. Longitudinal scale rows above lateral line obliquely positioned.
..... 7
- 6b. Longitudinal scale rows above lateral line entirely horizontal or
some rows rising obliquely from below middle part of dorsal fin.
..... 24
- 7a. Vomerine tooth patch triangular or diamond-shaped with a medial
posterior extension. 8
- 7b. vomerine tooth patch crescentic to triangular without medial
posterior extension. 12
- 8a. Axil of pectoral fin with a black spot on upper portion; a series of
8 or 9 broad orange or yellow stripes on side; soft dorsal rays
usually 15 soft anal rays 9..... *L. carponolatus*
- 8b. Axil of pectoral fin without a black spot; colour not as in 8a; soft
dorsal rays usually 13 or 14; anal rays usually 8. 9
- 9a. A large black spot usually present on upper side, series of 4 to 7
broad dark stripes on side. 10
- 9b. Black spot absent; a series of narrow yellowish longitudinal lines
on side, sometimes an enlarged dark stripe from eye to middle of
caudal fin base..... 11
- 10a. Soft dorsal rays 14; a relatively wide gap between temporal scale
bands of each side; spot on upper side situated mainly above
lateral line. *L. russelli*
- 10b. Soft dorsal rays usually 13; little or no gap between temporal scale
bands of each side; spot on upper side situated mostly below
lateral line. *L. fulviflamma*
- 11a. Mid-lateral stripe usually broader and darker than other stripes
on side; transverse scale rows on cheek 7 to 10..... *L. vitta*
- 11b. Mid lateral stripe not broader or darker than other stripes on side;
transverse scale rows on cheek usually 6 or 7. *L. madras*
- 12a. Total gill rakers on first arch 25 to 30; dorsal fin with X spines and
8 or 14 soft rays; caudal fin distinctly forked with rounded lobes;
colour deep red to grey, fins red or dark brown to blackish.
L. gibbus

- 12b. Total gill rakers on first arch 14 to 23; caudal fin emarginate; colour not as 12a. 13
- 13a. Soft anal rays 10; dorsal fin with XI spines and 16 rays; colour pattern consisting of three dark brown to red transverse bars, although they may be indistinct in large adults. *L. sebae*
- 13b. Soft anal rays 8 or 9; dorsal fin X or XI, spines 12 to 16 soft rays; colour not as in 13a. 14
- 14a. Preopercular notch distinct. 15
- 14b. Preopercular notch indistinct. 16
- 15a. Soft dorsal rays 15 or 16; body relatively deep; head usually with numerous bluish curvy lines; a chalky spot often present on lateral line; lips thick in large adults. *L. rivulatus*
- 15b. Soft dorsal rays 13 or 14; body usually more slender; caudal fin and distal third of dorsal fin blackish with a narrow white border. *L. fulvus*
- 16a. Colour pattern consisting of a series of 5 dark stripes on whitish ground colour; 2 or 3 uppermost stripes crossed by dark vertical bars forming a network; a large dark spot at base caudal fin. ...
..... *L. decussatus*
- 16b. Colour pattern not as in 16a. 17
- 17a. Nostrils set in a prominent groove in larger fish; 2 whitish spots below dorsal fin in juveniles; colour dark brown on upper back grading to whitish or pink below with strong reddish hue; dorsal and caudal fins dusky, edges white, outer portion of anal and pelvic fins blackish; upper third of pectoral fin dusky brown; tongue with a patch of fine granular teeth. *L. bohar*
- 17b. Nostrils not set in a groove; colour pattern not as in 17a; tongue smooth or with a patch of granular teeth. 18
- 18a. Caudal fin with a crescentic black marking, remainder of body and fins yellowish, a silvery sheen on lower side. *L. lunulatus*
- 18b. Caudal fin without a distinctive black marking; colour of body and fins variable. 19
- 19a. A black spot on upper side at level of lateral line below soft dorsal

- fin (faint or absent in large adults); remainder of body and fins mainly pale; tongue with a patch of granular teeth, absent in juveniles..... *L. monostigma*
- 19b. Black spot on upper side of body absent; tongue smooth. 20
- 20a. Dorsal spines X; soft anal rays usually 8; tongue with a patch of fine, granular teeth; colour grey-brown, reddish or pink ventrally, dorsal and caudal fins dusky brown or black, with a narrow white border posteriorly. *L. lemniscatus*
- 20b. Dorsal spines usually XI; soft and rays usually 9; tongue smooth; colour reddish. 21
- 21a. Dorsal profile or head concave; longitudinal scale rows below lateral line horizontal; hump on forehead absent; interorbital width narrow; pectoral fins yellow. *L. guilcheri*
- 21b. Dorsal profile of head straight, concave or convex; longitudinal scale rows below lateral line horizontal or oblique; hump on forehead present or absent; interorbital width variable; pectoral fins reddish or pink. 22
- 22a. A prominent hump on forehead and series of grooves behind eye; anterior and posterior nostrils are widely separated.
..... *L. sanguineus*
- 22b. Hump on forehead and grooves behind eye absent; anterior and posterior nostrils close-set. 23
- 23a. Mouth relatively small, maxilla length less than distance between bases of last dorsal and anal rays; some longitudinal scale rows below lateral line slanting obliquely; head profile convex.
..... *L. erythropterus*
- 23b. Mouth large, maxillar length about equal to distance between bases of last dorsal and anal rays; longitudinal scale rows below lateral line horizontal (although some rows may start obliquely in juveniles); head profile straight or slightly concave.
..... *L. malabaricus*.
- 24a. Vomerine tooth patch triangular with a median posterior extension, preorbital space narrow; a prominent black spot below posterior part of spinous dorsal fin. *L. ehrenbergii*

- 24b. Vomerine tooth patch crescentic to triangular without a posterior extension, preorbital space wider; black spot on back present or absent. 25
- 25a. A large black spot on upper back usually present; ground colour pale, each scale on side often with a brownish spot; tongue with a patch of fine granular teeth. *L. johnii*
- 25b. Black spot on upper back absent, ground colour dark, back and sides greenish-brown to reddish; belly silvery to whitish; specimens from deep water frequently overall reddish; a marine species also dwelling in creeks. *L. argentimaculatus*

Genus *Macolor* Bleeker

1860. *Macolor* Bleeker, *Acta Soc. Sci. Indo-Neerl*; 8 : 25.

Type species : *Macolor typus* Bleeker = *Macolor niger* Forsskal.

Medium sized snappers with an oblong relatively deep body; mouth large and protractile; a row of pointed conical teeth in jaws, vomerine tooth patch v-shaped; gill rakers long and slender, more than 50 on lower arm of first arch; dorsal fin continuous with X spines and 13-14 soft rays; anal fin with 3 spines and 10-11 soft rays; caudal fin emarginate.

Genus *Paracaesio* Bleeker

1875. *Paracasio* Bleeker, *Verst. Akad. Amsterdam* : 38, 92.

Type species : *Caesio xanthurus* Bleeker.

Medium sized snappers with fusiform bodies; jaws with an outer series of well developed canine teeth; dorsal fin continuous, not incised; pectoral fins long; caudal fin forked. 6 species, 2 known from Andaman and Nicobar Islands.

Key to the species *Paracaesio*

- 1a. Length of caudal fin about 2.3 to 2.5 times in standed length; back blue purplish-brown without an extensive yellow area.
..... *P. sordidus*
- 1b. Length of caudal fin about 2.6 to 2.8 in standard length; back

covered with a broad yellow area from forehead to caudal fin base.
 *P. xanthurus*

Genus *Pinjalo* Bleeker

1845. *Pinjalo*, Nat. Geneesk. Arch. Ned-Indie, 2.

Type species : *Caesio pinjalo* Bleeker.

Medium sized snappers with robust, moderately deep body; head relatively small, snout pointed; eye situated in centre of head; teeth in jaws small, no canine teeth; premaxillae protractile; dorsal fin continuous. 2 species; both known from Andaman and Nicobar Islands.

Key to the species *Pinjalo*

- 1a. Dorsal spines XI, dorsal soft rays usually 14; anal soft rays usually 10; pelvic and anal fins yellow; no white spot on upper half of caudal peduncle..... *P. pinjalo*
- 1b. Dorsal spines XII, dorsal soft rays 13; anal soft rays 9; pelvic and anal fins pink or whitish; a white spot on upper half of caudal peduncle. *Pinjalo lewsi*

Genus *Pristipomoides* Bleeker

1852. *Pristipomoides* Bleeker, Nat. Tijdschr Ned. Indie, 3 : 575.

Type species *Pristipomoides typus* Bleeker.

Small to medium-sized Snappers with fusiform bodies; jaws with outer row of conical and an inner band of villiform teeth; vomerine toothed; interorbital space flattened; dorsal fin continuous; lost soft ray of dorsal and anal fins extended; caudal fin deeply forked.

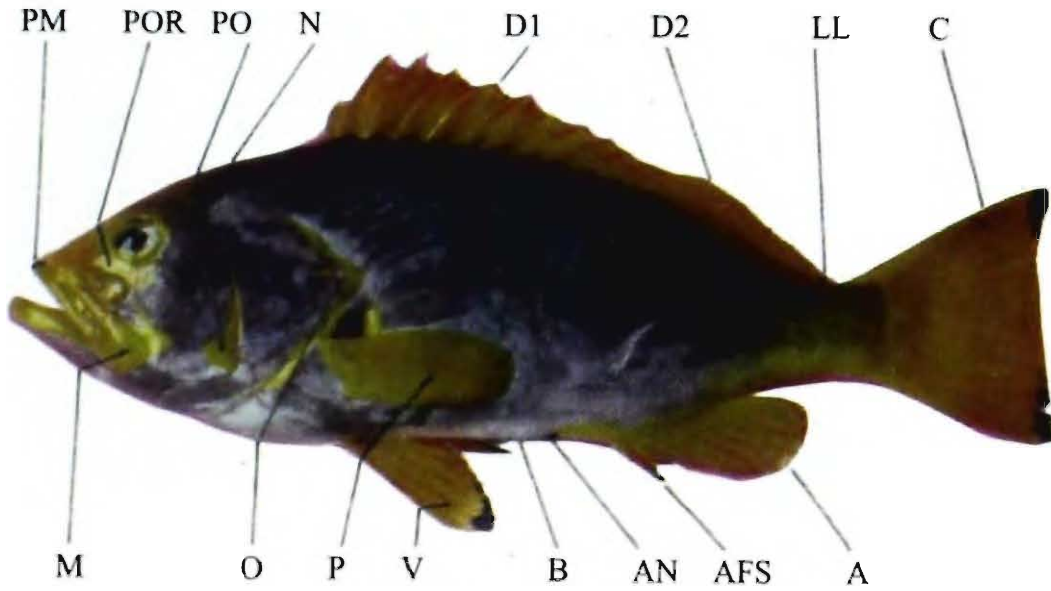
Eleven species; 4 known from Andaman and Nicobar Islands.

Key to the species *Pristipomoides*

- 1a. Lateral line 48-50; two golden, bands bordered with dark blue on snout and cheek; transverse vermiculations on top of head.
 *P. multidentis*

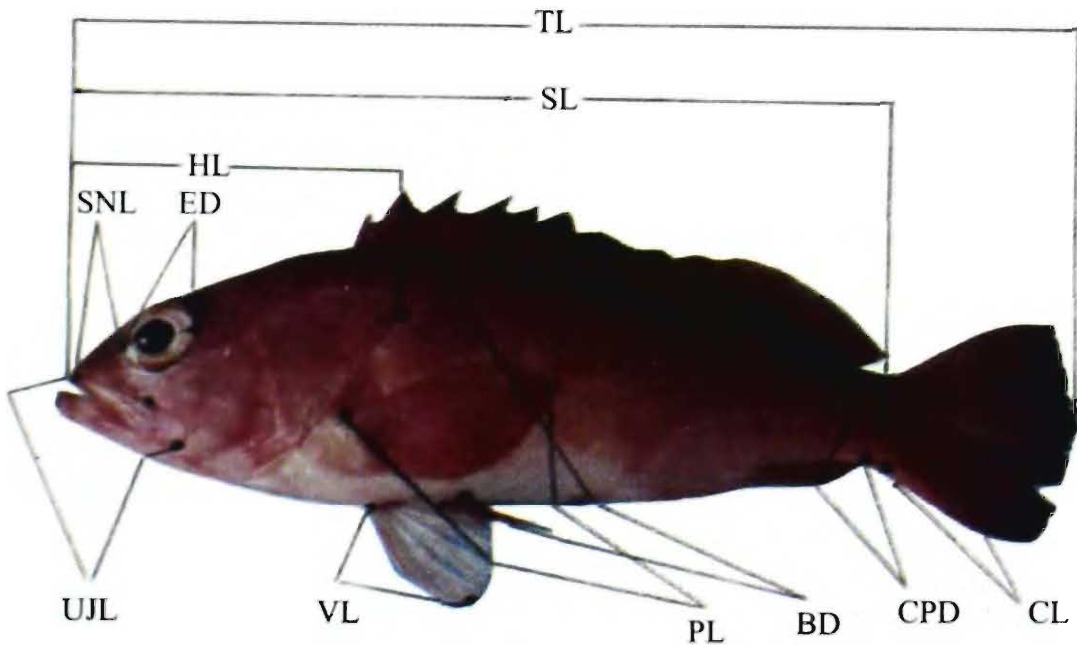
- 1b. Lateral line 57-71; no golden bands on snout and cheek..... 2
- 2a. Total gill rakers 28-33; lateral line scales 67-71; vomerine tooth patch diamond shaped; patch of teeth on tongue. *P. sieboldii*
- 2b. Total gill rakers 17-25; lateral line scales 57-67; vomerine tooth patch triangular or V-shaped; tongue without teeth. 3
- 3a. Lateral line scales 63-67; sides of body with alternating red and yellow bars. *P. zonatus*
- 3b. Lateral line scales 57-62; sides of body without irregular dark marking. *P. filamentosus*

EXTERNAL FEATURES OF FISH



- | | | | | | |
|-----|-------------------|----|--|-----|---------------------|
| A | anal fin | D1 | 1st dorsal fin (generally spinous) | O | Opercle |
| AFS | anal fin spine | D2 | 2nd dorsal fin *generally with single spine in front of soft rays) | P | pectoral fin |
| AN | anus (vent) | LL | lateral line | PM | premaxilla |
| B | belly | M | maxilla | PO | preopercle |
| C | caudal (tail) fin | N | nape | POR | preorbital |
| | | | | V | pelvic (vental) fin |

MEASUREMENTS OF A FISH



- | | | | | | |
|-----|-----------------------|----|--------------------|-----|----------------------------|
| BD | body depth | HL | head length | SNL | snout length |
| CL | caudal fin length | PL | pectoral finlength | TL | total length |
| CPD | caudal peduncle depth | SL | standard length | UJL | upper jaw length |
| ED | eye orbit diameter | | | VL | pelvic (vental) fin length |



Aethaloperca rogae (Forsskal)



Anyperodon leucogrammicus (Valenciennes)



Cephalopholis argus Bloch and Schneider

GROUPERS

Aethaloperca rogae (Forsskal)

Redmouth Grouper

Body deep and compressed; mouth large; dorsal profile of head straight to eye, becoming convex on nape; 2-4 rows of teeth at side of lower jaws; palatine teeth present; pelvic fin long, reaching beyond anus. *Colour* : dark brown, inside of mouth and gill cavity scarlet. Attains 600 mm; common between 130-450 mm; caught with hook and lines and gill nets; inhabits coral reef areas; Red Sea and Western Indian Ocean. Not common in the catches, marketed fresh.

Anyperodon leucogrammicus (Valenciennes)

Slender Grouper

Body elongate and compressed; head pointed; mouth large and protractile; a pair of canine teeth anteriorly in jaws; vomer toothed, no teeth on palatines. *Colour* : greenish to brownish grey with numerous orange-red spots on head, body, dorsal fin and basally on caudal fin; 4 longitudinal whitish streaks usually present on head and body; Attains 500 mm; common between 140-450 mm; Caught with hook and lines and gill nets; Inhabits coral reef often found on protected than exposed reefs; Tropical Indo-West Pacific; Excellent food fish. Marketed usually fresh.

Cephalopholis argus Bloch and Schneider

Peacock Grouper

A small sized grouper with a stout body; mouth oblique, the lower jaw strongly projecting; teeth on midside of lower jaw of adults in 5 or 6 rows; pelvic fin short, not reaching anus; caudal fin rounded. *Colour* : dark brown with numerous small black-edged blue spots on body, head and fins; usually 5-6 pale bars often present on posterior half of body; posterior margin of median, caudal and pectoral fins narrowly whitish; Attains 400 mm; common between 100-300 mm; Caught with hook and line and gill nets; Inhabits shallow coral reefs and rocky areas. It is more often found on exposed than protected reefs; Indo-Pacific; Excellent food fish. Usually marketed fresh.



Cephalopholis boenak (Bloch)



Cephalopholis cyanostigma (Valenciennes)



Cephalopholis formosa (Shaw and Nodder)

Cephalopholis boenak (Bloch)**Chocolate Grouper**

A small sized grouper with a stout body; mouth oblique; teeth fine, in bands in jaws with a pair of canine teeth anteriorly in jaws; minute teeth on vomer and palatines; pelvic fins usually not reaching anus; caudal fin rounded. *Colour* : brown with 8-9 slightly irregular reddish brown bars on body; fins dark brown; distal margin of caudal fin bluish white; inside of the mouth orange-red; Attains 250 mm; common between 80-200 mm; Caught with hook and line and gill nets; usually found on dead reefs in protected waters; Indo-West Pacific; Taken commercially. Marketed mostly fresh.

Cephalopholis cyanostigma (Valenciennes)**Bluspotted Grouper**

A small sized grouper with a stout body; mouth some what oblique; the maxillary extending beyond posterior border of eye; teeth villiform, forming rather broad bands, with a pair of short canine on each side of symphysis of each jaw; pelvic fins usually not reaching anus; caudal fin rounded. *Colour* : brownish-red with numerous small black-edged pale blue spots on head, body and fins; Attains 350 mm; common between 70-250 mm; Caught with hook and line and gill nets; Inhabits shallow water of coral reefs and sea-grass beds; Indo-West Pacific; Commercially important fish. Not common in the catches. Marketed usually fresh.

Cephalopholis formosa (Shaw and Nodder)**Bluelined Grouper**

A small sized grouper with a stout body; mouth oblique, the lower jaw projecting; teeth in narrow bands in jaws with a pair of canines in front of each jaw; maxilla reaching posterior to orbit; pelvic fin just reaching anus; caudal fin rounded. *Colour* : dark yellowish brown with slightly irregular narrow blue stripes on head, body and fins; Attains 350 mm; Common between 100-250 mm; Caught with hook and line and gill nets; Inhabits shallow waters of sheltered dead or silty reefs; Indo-West Pacific; Excellent food fish. Usually marketed fresh.



Cephalopholis leopardus (Lacepede)



Cephalopholis microprion (Bleeker)



Cephalopholis miniata (Forsskal)

Cephalopholis leopardus (Lacepede)
Leopard Grouper

A small sized grouper with a stout body; mouth some what oblique; teeth villiform, forming rather broad bands, with a pair of canines on each side of symphysis of lower jaw; teeth on vomer and palatines; pelvic fins not reaching anus. *Colour* : reddish brown, shading to whitish ventrally, with numerous red-orange spots; a large saddle like dark brown spot dorsally on caudal peduncle and a similar spot behind it; oblique reddish black streak on upper and lower part of caudal fin; pectoral fin yellow; Attains 185 mm; Common between 90-130 mm; Caught with hook and line and gill nets; Inhabits coral reefs; Indo-West Pacific; Excellent food fish. Usually marketed fresh.

Cephalopholis microprion (Bleeker)
Freckled grouper

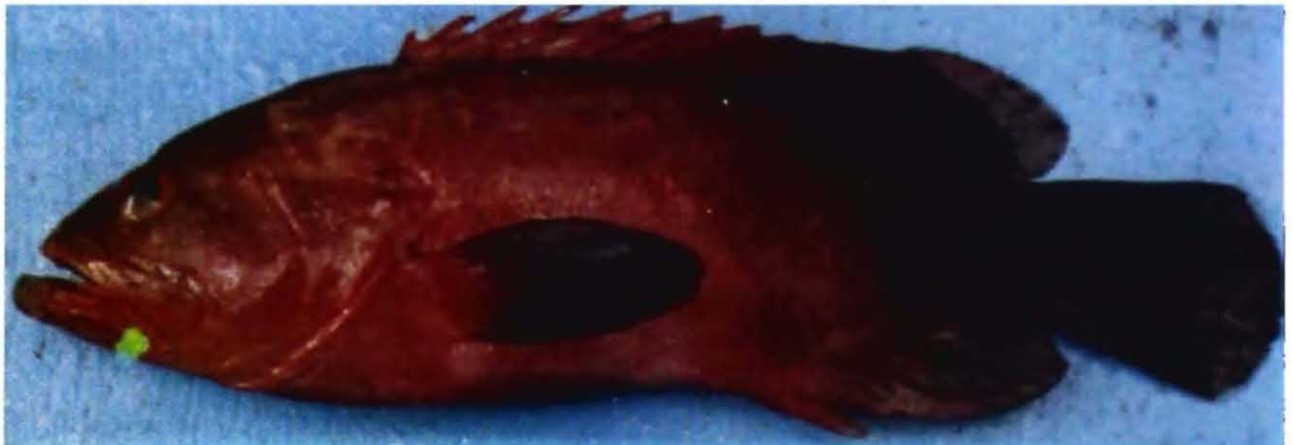
A small grouper with a stout body; mouth oblique, the lower jaw projecting; teeth in narrow bands in jaws, with a pair of canines in front of each jaw; pectoral fin moderately long. *Colour* : dark brown; 6 broad dark bars on body present or absent; head and anterior body with numerous small dark-edged blue spots; caudal fin with a gray-blue distal margin. Attains 250 mm; Common between 90-200 mm; Caught with hook and line and gill nets; Inhabits shallow water, usually found on silty reefs; Indo-West Pacific; Excellent food fish. Usually marketed fresh.

Cephalopholis miniata (Forsskal)
Coral Grouper

A small grouper with a stout body; mouth oblique, the lower jaw projecting; teeth in narrow bands in jaws, with a pair of canines in front of each jaw; maxilla extending to posterior margin of eye or slightly beyond; pelvic fin not reaching anus. *Colour* : Orange-red to reddish brown with numerous bright blue spots on head, body and median fins. Attains 350 mm; common between 100-300 mm. Caught with hook and line and gill nets, Inhabits well developed coral reefs in clear water, more often on exposed than protected reefs; Indo-West Pacific; Taken commercially. Excellent food fish. Marketed mostly fresh.



Cephalopholis souccrati (Valenciennes)



Cephalopholis urodeta (Forster)



Cromileptes altivelis (Valenciennes)

Cephalopholis sonnerati (Valenciennes)
Tomato Grouper

A small sized grouper with a stout body; mouth oblique, the lower jaw projecting; teeth villiform in broad bands, with a pair of canines at symphysis of each jaw; small teeth on vomer and palatines; teeth absent on tongue; pelvic fins usually reaching or extending beyond anus; caudal fin rounded. *Colour* : body orange-red to reddish brown, often with scattered small whitish blotches; head purplish to reddish brown with numerous close-set orange-red spots; pelvic fins often blackish distally. Attains 550 mm; common between 100-350 mm. Caught with hook and line and gill nets. Inhabits coral reef area. Tropical Indo-West Pacific. Excellent food fish. Taken commercially. Marketed fresh.

Cephalopholis urodeta (Forster)
Darkfin Grouper

A small sized grouper with a stout body; mouth oblique, the lower jaw projecting; maxillar extending well beyond posterior edge of eye; pelvic fins usually not reaching anus; caudal fin rounded. *Colour* : reddish brown; head and nape with numerous small close-set orange spots; caudal fin dark reddish brown with numerous small pale blotches. Attains 250 mm; common between 100-200 mm. Caught with hook and line and gill nets. Inhabits shallow water coral reef, usually found in outer reef area. Indo-Pacific. Occasionally seen in markets. Usually marketed fresh.

Cromileptes altivelis (Valenciennes)
Humpback Grouper

A moderate-sized grouper, body moderately deep; dorsal profile of head very concave, straight to above posterior part of eye, then rising steeply to origin of dorsal fin; a broad band of villiform teeth in jaws; a pair of very small canines in upper jaw and none in lower; caudal fin rounded; pelvic fin just reaching anus. *Colour* : greenish white to light greenish brown with scattered round black spots on head, body and fins. Attains 650 mm; common between 100-450 mm. Caught with hook and line and gill nets. Inhabits in dead or silty reef area. Also found in well developed coral reefs. Western Indian - Western Pacific ocean. Occasionally seen in markets. Excellent food fish. Marketed usually fresh.



Epinephelus arcolatus (Forsskal)



Epinephelus bleekeri (Valliant & Bocourt)



Epinephelus caeruleopunctatus (Bloch)

Epinephelus areolatus (Forsskal)**Areolate Grouper**

Body moderately elongate and compressed; interorbital space slightly convex; teeth on midside of lower jaw in two rows; caudal fin slightly emarginate to truncate; pectoral fins usually reaching anus. *Colour* : whitish with numerous close-set roundish to polygonal brown to yellowish spots on head, body and fins; spots in dorsal fin 2-4 rows; a distinct narrow white border posteriorly on caudal fin. Attains 400 mm; common between 130-300 mm, Caught with hook and line and gill nets. Found in some what turbid water in seagrass beds or silty sand bottoms around isolated small rock outcrops, dead coral or soft coral. Indo-West Pacific. Excellent food fish. Commercially important fish. Usually marketed fresh.

Epinephelus bleekeri (Valliant & Bocourt)**Bleeker's Grouper**

Body elongate; interorbital space slightly convex to nearly flat; operculum with a straight upper border and three flat spines; midside of the lower jaw with two rows of teeth, canines at front of jaws; caudal fin truncate. *Colour* : body brownish to purplish gray with numerous small orange-yellow spots on head, body, dorsal fin and upper half of caudal fin; lower half of caudal fin and outer edge of anal fin purple-brown. Attains 750 mm; common between 100-500 mm. Caught with hook and line and gill nets. Found on rocky bottoms and reef area. Mauritius, Persian gulf, India, Sri Lanka, Philippines, Thailand, Taiwan and China. Excellent food fish, fetching medium prices in local market. Usually marketed fresh.

Epinephelus caeruleopunctatus (Bloch)**White-spotted Grouper**

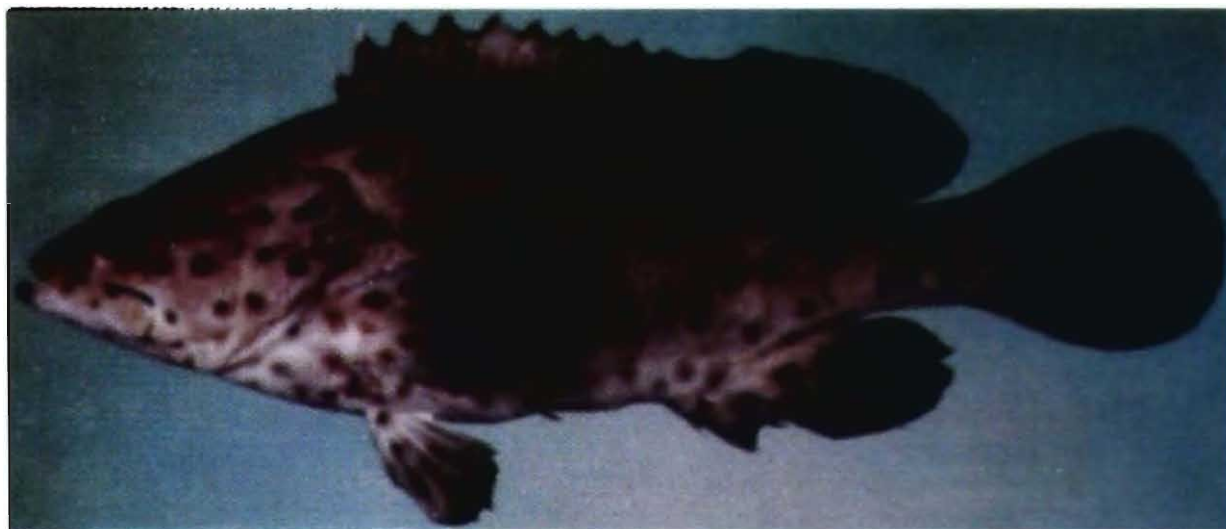
Body moderately elongate; head pointed, the dorsal profile nearly straight; 3-5 rows of teeth at side of lower jaw; opercular flap acute, the upper edge only slightly convex, pelvic fins short, the tips not approaching anus; caudal fin rounded. *Colour* : brownish gray, the body posterior head and dorsal fin with scattered large whitish spots and numerous small pale spots; a series of indistinct dark blotches on back at base of dorsal fin and one on caudal peduncle; a broad black streak on upper edge of maxillary groove. Attains 700 mm; common between 100-450 mm. Caught with hook and line and gill nets. Inhabits coral reef areas. Indo-West Pacific. Excellent food fish. Common in the catches. Usually marketed fresh.



Epinephelus chlorostigma (Valenciennes)



Epinephelus coioides (Hamilton)



Epinephelus corallicola (Valenciennes)

Epinephelus chlorostigma (Valenciennes)**Brown-spotted grouper**

Body elongate and laterally compressed; front of head pointed, the lower jaw strongly protruding; dorsal profile of head to nape straight; scales on flanks ctenoid with auxillary scales; lower jaw with two rows of teeth at the sides; caudal fin slightly emarginate to truncate. *Colour* : body whitish densely spotted with small dark brown spots on head, body and fins; rear edge of caudal fin usually with a narrow white margin. Attains 750 mm; common between 120-500 mm. Caught with hook and line and gill nets. Inhabits shallow and deep waters of coral and rocky areas. Wide spread in the central tropical Indo-West Pacific. Taken commercially. Excellent food fish. Usually marketed fresh.

Epinephelus coioides (Hamilton)**Orange-spotted Grouper**

Body elongate and not very compressed; interorbital space usually slightly convex; the maxilla extending to rear edge of eye; teeth on midside of lower jaw in 2 rows; pelvic fins not reaching anus; caudal fin rounded. *Colour* : light greyish brown dorsally, shading to whitish on side and ventrally with numerous brownish orange spots on head and body; 5 slightly diagonal grayish brown bars on head and body which bifurcate ventrally. Attains 800 mm; Common between 100-700 mm. Caught with hook and line and gill nets. Inhabits rocky and coral reef areas. It is often found in brackish areas. Indo-West Pacific. It is an important commercial fish. Usually marketed fresh.

Epinephelus corallicola (Valenciennes)**Coral Grouper**

Body moderately elongate; dorsal profile of head nearly straight; interorbital space flat; 3 or 4 rows of teeth on midside of lower jaw; pelvic fins not reaching or just reaching anus; caudal fin rounded. *Colour* : brownish to greenish gray with widely scattered black spots on head, body and fins; 3 dusky blotches on back at base of posterior half of dorsal fin; a black streak at upper edge of maxillary groove. Attains 450 mm; common between 100-350 mm. Caught with hook and line and gill nets. Inhabits shallow-water areas, generally found on silty reefs. Indo-West Pacific. Excellent food fish. Usually marketed fresh.



Epinephelus erythrurus (Valenciennes)



Epinephelus fasciatus (Forsskal)



Epinephelus faveatus (Valenciennes)

Epinephelus erythrurus (Valenciennes)**Cloudy Grouper**

Body moderately elongate; head pointed, the dorsal profile nearly straight; interorbital space flat to slightly convex; teeth on midside of lower jaw in 2 or 4 rows; pelvic fin short, not reaching anus; caudal fin rounded. *Colour* : olive to reddish brown usually with large and small pale spots in body, most of which are horizontally elliptical and often irregular; head with 2 dark bands across cheek and operculum; a dark streak at upper edge of maxillary groove. Attains 400 mm; Common between 100-300 mm. Caught with hook and line and gill nets. Inhabits coastal waters, mainly occur on muddy substrate. Indian Ocean. Excellent food fish. Usually marketed fresh.

Epinephelus fasciatus (Forsskal)**Blacktip Grouper**

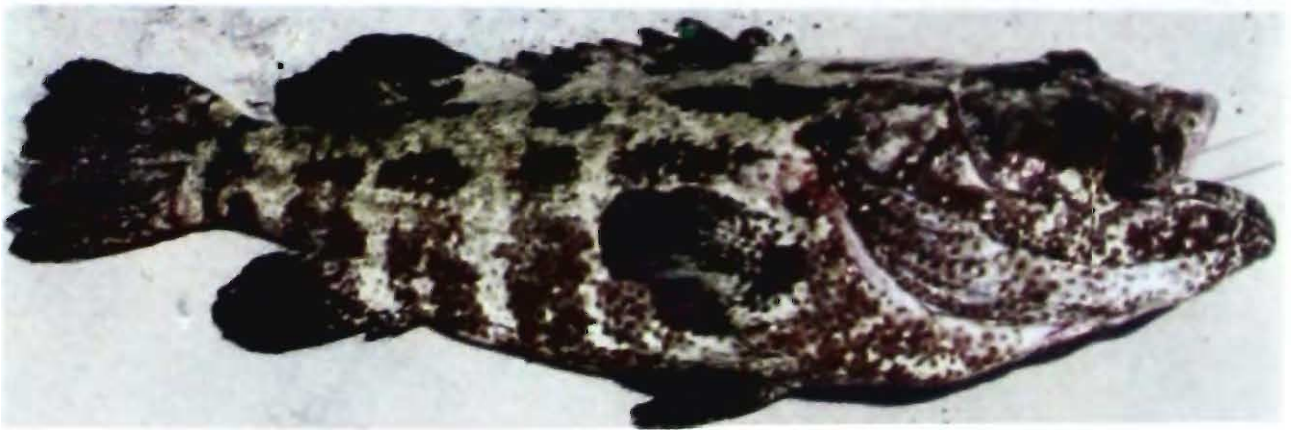
Body oblong and somewhat robust; interorbital space usually flat; midside of lower jaw with 2-4 rows of teeth; pelvic fins not reaching or just reaching anus; caudal fin slightly to moderately rounded. *Colour* : Pale yellowish red with 5 red bands on body; margin of spinous dorsal fin black. Attains 400 mm; Common between 100-250 mm. Caught with hook and line and gill nets; A common species of coral reefs and rocky bottom; Tropical Indo-Pacific; Excellent food fish. Minor importance to fisheries. Usually marketed fresh.

Epinephelus faveatus (Valenciennes)**Indian Grouper**

Body not very compressed; interorbital space flat; dorsal profile of head convex; teeth on midside of lower jaw in 2 rows; pelvic fin not reaching anus; caudal fin rounded. *Colour* : whitish with numerous close-set roundish brown spots of unequal size on head, body and fins; posterior margin of caudal fin narrowly white. Attains 300 mm; Common between 100-250 mm. Caught with hook and line and gill nets. It is a shallow water species of coral reef and rocky substrata; Southern India, Sri Lanka, Bali & Indonesia. Excellent food fish. Minor importance to fisheries. Usually marketed fresh.



Epinephelus flavocaeruleus (Lacepede)



Epinephelus fuscoguttatus (Forsskal)



Epinephelus hexagonatus (Forster)

Epinephelus flavocaeruleus (Lacepede)
Blue and Yellow Grouper

Body moderately deep and compressed; interorbital space strongly convex; mouth strongly oblique; midside of lower jaw with 2 rows of teeth; pelvic fin not reaching anus; caudal fin truncate to slightly emarginate. *Colour* : small adults deep blue, becoming yellow on lips, caudal peduncle and fins, large adults may lose the yellow coloration and become overall deep blue. Attains 900 mm; Common between 150-650 mm. Caught with hook and line and gill nets; Occurs in coral reef areas and on rocky bottoms; Indian Ocean; Excellent food fish. Usually marketed fresh.

Epinephelus fuscoguttatus (Forsskal)
Brown marbled Grouper

Body moderately deep; dorsal head profile with an indentation above rear edge of eye; interorbital area flat; teeth on side of lower jaw in 3 rows; pelvic fin not approaching anus; caudal fin rounded. *Colour* : light yellowish brown with irregular blotches of variable size on head and body; a black saddle-like spot on caudal peduncle; head, body and fins with numerous close-set small dark brown spots. Attains 900 mm; Common between 100-550 mm. Caught with hook and line and gill nets; Inhabits coral reefs and rocky substrata; Central Indo-Pacific; Excellent food fish. Taken commercially. Usually marketed fresh.

Epinephelus hexagonatus (Forster)
Star-spotted Grouper

Body moderately deep; interorbital space flat; midside of lower jaw with 3-5 rows of teeth; pelvic fins not reaching or just reaching anus; caudal fin rounded. *Colour* : silvery white dots at edges of brown polygonal spots, 4 black blotches formed by groups of dark polygonal spots are usually present on body at base of dorsal and extending into the fin and 1 dorsally on caudal peduncle; pectoral pale with indistinct dark spots. Attains 250 mm; Common between 90-170 mm; Caught with hook and line and gill nets; Found in areas where coral reefs flourish; Tropical Indo-Pacific; Excellent food fish. Usually marketed fresh.



Epinephelus lanceolatus (Bloch)



Epinephelus longispinis (Kner)



Epinephelus macrospilos (Bleeker)

Epinephelus lanceolatus (Bloch)
Giant Grouper

Body robust and deep in large individuals; interorbital space flat to slightly convex; maxilla extending posterior to rear edge of eye; small canine teeth at front of jaws; pelvic fins short, not approaching anus; caudal fin rounded. *Colour* : juveniles and sub-adults irregularly barred and mottled with dark brown spots; adults dark greyish brown, mottled with pale; the fins with numerous small black spots. Attains 2500 mm; Common between 200-2000 mm; Caught with hook and line and gill nets; Inhabits coral reef areas and estuaries; Tropical Indo-Pacific; Excellent food fish. Commercially important fish. Usually marketed fresh.

Epinephelus longispinis (Kner)
Longspine Grouper

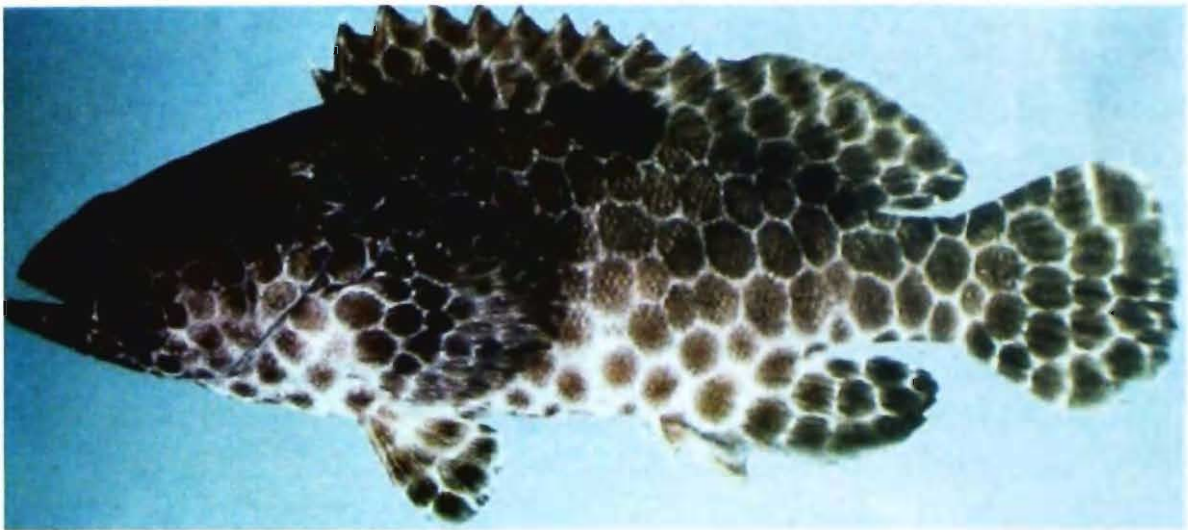
Body moderately elongate; interorbital space flat to slightly convex; 2 rows of teeth on midside of lower jaw; pelvic fins not reaching anus; caudal fin slightly rounded. *Colour* : head and body pale brown with dark reddish brown spots that are round and well separated on head and front part of body, but become crowded and elongated to form short oblique streaks on rear part of body and peduncle. Attains 540 mm; common between 150-450 mm; Caught with hook and line and gill nets; Generally occurs on coral reefs or rocky substrata; Indian Ocean from the Transkei to Indonesia; Excellent food fish. Marketed usually fresh.

Epinephelus macrospilos (Bleeker)
Snubnose Grouper

Body moderately thick; dorsal profile of head with an angularity above anterior edge of orbit, giving a snubnose effect; snout short; interorbital space flat or slightly concave; teeth on midside of lower jaw in 2 rows; pelvic fins not reaching anus; caudal fin rounded. *Colour* : large round to polygonal brown to dark brown spots on head and body; a narrow dark brown streak at upper edge of maxillary groove; fins yellowish with black spots, except pectoral fins without black spots or with only a few basally. Attains 500 mm; Common between 100-450 mm. Caught with hook and line and gill nets; Inhabits around coral reefs; Eastern Indian Ocean and Western Pacific; Excellent food fish. Usually marketed fresh.



Epinephelus malabaricus (Bloch and Schneider)



Epinephelus melanostigma Schultz



Epinephelus merra Bloch

Epinephelus malabaricus (Bloch and Schneider)
Malabar Grouper

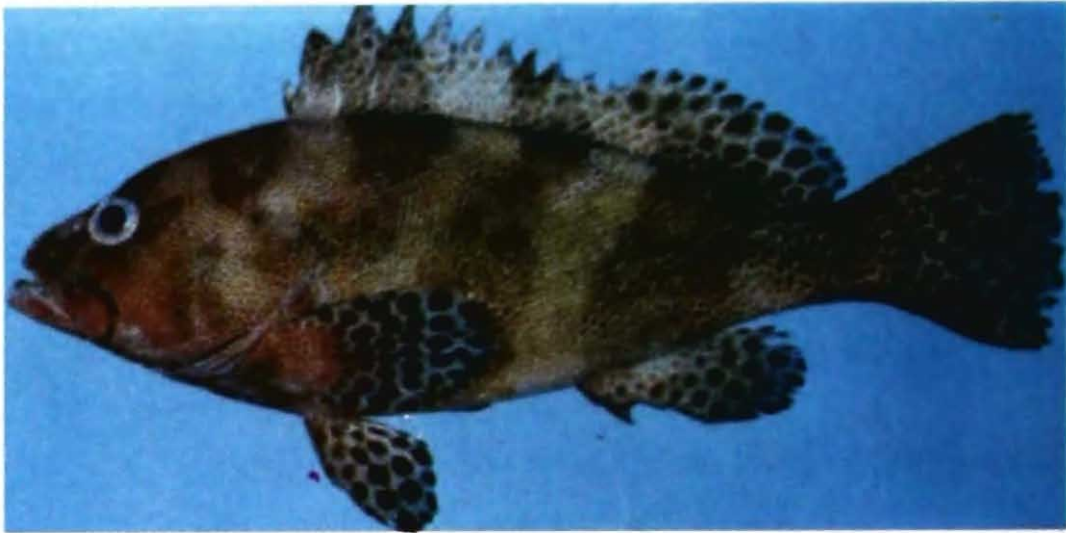
Body moderately elongate and not very compressed; eye relatively small; interorbital space usually slightly convex; maxilla extending posterior to a vertical at rear edge of orbit; 2 rows of teeth on midside of lower jaw in subadults, increasing to 4-5 rows in large adults; pelvic fins not approaching anus; caudal fin rounded. *Colour* : light greyish to yellowish brown with 5 slightly oblique broad dark brown bars on body which tend to bifurcate ventrally and may contain pale areas; head and body with numerous small well-separated black spots and scattered large pale spots and blotches; a dark streak usually present at upper edge of maxillary groove; fins with scattered small black spots. Attains 1000 mm; Common between 150-750 mm. Caught with hook and line and gill nets; Occurs on protected reefs and creeks; Tropical Indo-West Pacific; Excellent food fish. Fairly common in the commercial catches. Usually marketed fresh.

Epinephelus melanostigma Schultz
Blackspot Grouper

A small grouper; interorbital space flat; maxilla reaches past eye; 3-5 rows of teeth on midside of lower jaw; pelvic fins short, usually not reaching anus; caudal fin rounded. *Colour* : head, body and fins with close-set polygonal brown spots, the pale inter spaces forming a network; only one dark blotch at base of dorsal. Attains 300 mm; Common between 100-250 mm. Caught with hook and line and gill nets; A shallow-water coral reef species; Western Indian Ocean to Western Central Pacific; Excellent food fish. Marketed fresh.

Epinephelus merra Bloch
Dwarf spotted Grouper

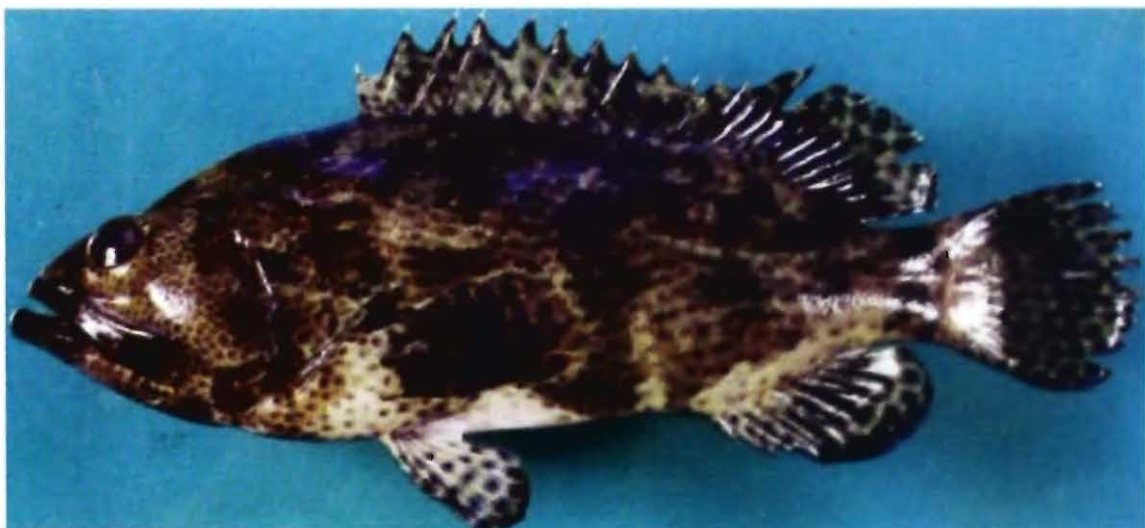
A fairly small grouper; interorbital space flat to slightly convex; maxilla reaches past eye; 2 rows of teeth on midside of lower jaw; pelvic fins usually not reaching anus; caudal fin rounded. *Colour* : whitish to light brown with numerous close-set round to hexagonal dark brown spots, a few spots joined to form diagonal dark bands; spots on head progressively smaller anteriorly; black spots on pectorals, small throughout and largely confined to rays. Attains 300 mm; Common between 100-250 mm; Caught with hook and line and gill nets; Inhabits shallow-water usually found around coral knolls in protected waters such as lagoons or bays; Tropical and sub-tropical Indo-Pacific; Excellent food fish. Very common in commercial catches. Usually marketed fresh.



Epinephelus miliaris (Valenciennes)



Epinephelus ongus (Bloch)



Epinephelus polyphekadion (Bleeker)

Epinephelus miliaris (Valenciennes)**Netfin Grouper**

Body moderately elongate; interorbital space slightly convex; maxilla not reaching past eye; 2-4 rows of teeth on midside of lower jaw; pelvic fins usually not reaching anus; caudal fin rounded. *Colour* : whitish with numerous small close-set polygonal brownish yellow spots on head and body; 5 broad irregular diagonal dark bars on body; spots on fins are larger except spinous dorsal fin spotted like body. Attains 500 mm; Common between 150-450 mm; Caught with hook and line and gill nets; Inhabits in shallow-waters of coral reef and seagrass bed, also enters creeks; Eastern Indian Ocean and Western Pacific; Excellent food fish. usually marketed fresh.

Epinephelus ongus (Bloch)**Specklefin Grouper**

Body oblong and laterally compressed; interorbital space flat to slightly convex; 2-4 rows of teeth on midside of lower jaw; pelvic fins short, not reaching anus; caudal fin rounded. *Colour* : brown with numerous small white spot on body which tend to form irregular horizontal rows and may coalesce into narrow stripes; a prominent black streak at upper edge of maxillary groove; median fins grayish brown, finely spotted with white; the soft portions of the dorsal, anal and the posterior edge of the caudal with a narrow white margin and a blackish sub marginal band. Attains 300 mm; Common between 100-250 mm; caught with hook and line and gill nets; It is a shallow-water species of coral reefs and rocky substrata; Western Indian Ocean to Western Pacific; Excellent food fish. Usually marketed fresh.

Epinephelus polyphekadion (Bleeker)**Camouflage Grouper**

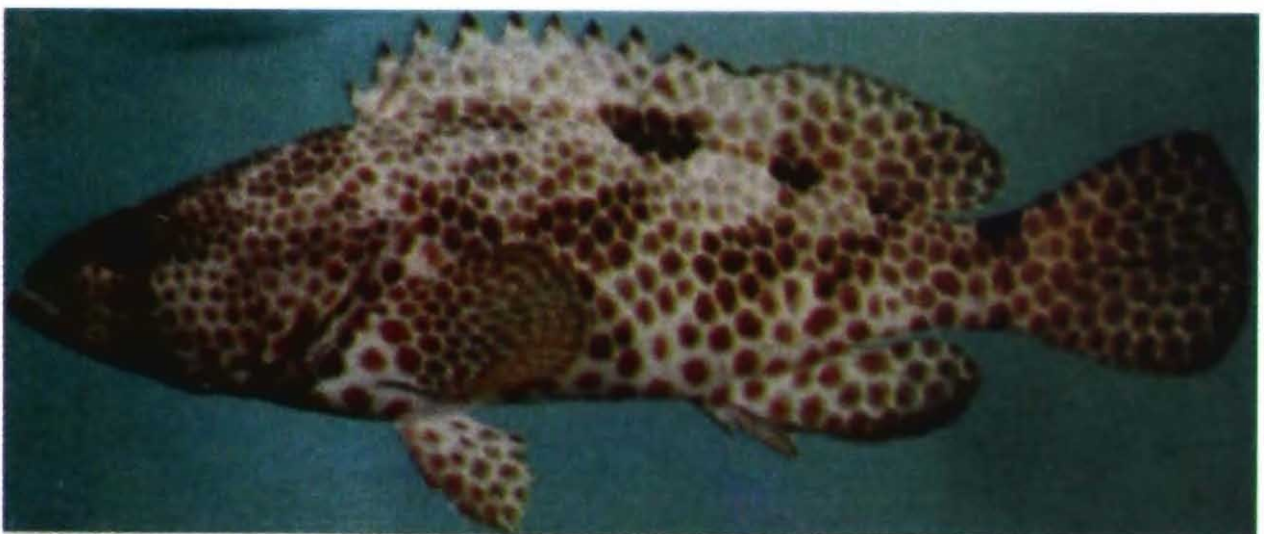
Body moderately deep; dorsal head profile smoothly convex; interorbital area flat; anterior nostrils subequal to posterior; flank scales ctenoid, with auxillary scales; maxilla reaches well past eye; 2 or 3 rows of teeth at side of lower jaw; pelvic fins not reaching anus; caudal fin rounded. *Colour* : head, body and fins brownish, covered with small dark spots (smaller than pupil) head and body with more or less distinct, dark blotches; a prominent black saddle-like spot dorsally on caudal peduncle; all fins with numerous small dark brown spots, those on pectoral fins very small and mainly on rays. Attains 750 mm; Common between 150-600 mm; Caught mainly on hook and line and gill nets; This species is usually found in clear water on coral reefs, both in lagoons and outer reef area; Indo-Pacific; Commercially important in these islands. Marketed mostly fresh.



Epinephelus polystigma (Bleeker)



Epinephelus quoyanus (Valenciennes)



Epinephelus spilotoceps Schultz

Epinephelus polystigma (Bleeker)
White-dotted Grouper

Body moderately elongate; dorsal profile of head to above preopercle nearly straight; snout short; interorbital space flat to slightly convex; maxilla extending posterior to a vertical at rear edge of orbit; teeth in jaws very small; caudal fin rounded; pelvic fins of adults not reaching anus. *Colour* : adults dark brown, the head, body and all fins except the pelvics with white dots; soft portions of dorsal and anal fins and posterior caudal and pectoral fins with a narrow orange-red margin. Attains 500 mm; common between 100-450 mm; Caught on hook and line and with gill net; It is generally found in sheltered bays and creeks; Indonesia, Papua New Guinea, Solomon Ids, Philippines and Andaman Islands; Excellent food fish. Usually marketed fresh.

Epinephelus quoyanus (Valenciennes)
Longfin Grouper

Body oblong and laterally compressed; dorsal profile of head convex; snout short; interorbital space flat; 2 rows of teeth on midside of lower jaw; pelvic fins not reaching or just reaching anus; caudal fin rounded; *Colour* : whitish with numerous large close-set hexagonal to roundish black spots on body, head and fins; a black streak at upper edge of maxillary groove. Attains 400 mm; Common between 100-350 mm; Caught with hook and line and gill nets; It is more often found on inshore silty reefs than clear outer reef areas; Western Indian Ocean and Western Pacific; Excellent food fish. Usually marketed fresh.

Epinephelus spilotoceps Schultz
Four saddle Grouper

Body elongate; caudal peduncle slender; Interorbital space flat; 3-4 rows of teeth on midside of lower jaw; pelvic fins short, not reaching anus; caudal fin rounded. *Colour* : whitish with numerous dark brown spots on head and body; spots dorsally on body polygonal and very close-set, the inter spaces forming a fine reticulum; 3 black blotch on back at base of dorsal fin and 1 on caudal peduncle; all fins with close-set dark brown spots. Attains 300 mm; Common between 100-250 mm; Caught with hook and line and gill nets; Found in shallow-water coral reef areas; Western Indian Ocean and Western Pacific; Excellent food fish. Usually marketed fresh.



Epinephelus tauvina (Forsskal)



Epinephelus undulosus (Quoy and Gaimard)



Plectropomus areolatus (Ruppell)

Epinephelus tauvina (Forsskal)
Greasy Grouper

Body elongate, maxilla reaches well past eye; 3-5 rows of teeth at side of lower jaw; upper margin of operculum moderately convex; the opercular flap pointed; caudal fin rounded. *Colour* : body greyish to pale brown dorsally, shading to whitish ventrally, with numerous roundish orange-red to dark red-brown; five faint, oblique dark bars may be visible on body; blackish blotch usually present at base of last four dorsal spines and extending into fin; dark spots on soft dorsal, caudal and anal fin. Attains 750 mm; Common between 150-650 mm; Caught with hand lines and long lines, trapes and gill nets; Mainly found in coral reef areas; Widespread in the tropical Indo-Pacific; Excellent food fish. Usually marketed fresh.

Epinephelus undulosus (Quoy and Gaimard)
Wavy-lined Grouper

Body moderately deep and compressed; interorbital space convex; 2 rows of teeth on midside of lower jaw; pelvic fins reaching anus; caudal fin truncate to slightly emarginate. *Colour* : purplish to brownish gray with yellowish brown dots on head and slighty wavy longitudinal yellowish brown lines on body (lines usually lost on large adults); spinous dorsal fin narrowly blackish. Attains 750 mm; common between 200-700 mm; Caught with hook and line; Inhabits coral reef and rocky areas; Indo-West Pacific; Excellent food fish. Usually marketed fresh.

Plectropomus areolatus (Ruppell)
Squaretail coral Grouper

Body elongate; interorbital space flat except at edge of orbit where rounded; a pair of canine teeth at front of both jaws; side of lower jaw with 2 enlarged canine teeth; opercle with 3 flat spines; pelvic fins short; caudal fin truncate to slightly emarginate. *Colour* : brownish red with numerous round to slightly oblong dark edged blue spots on head, body and fins; pectoral fins with small dark edged blue spots; pelvic fins with a few small dark-edged blue spots on the base on ventral surface. Attains 750 mm; Common between 200-600 mm. Caught with hook and line and gill nets. Found in coral reef areas; Indo-West Pacific; Excellent food fish. Usually marketed fresh.



Plectropomus maculatus (Bloch)



Plectropomus pessuliferus (Fowler)



Variola albimarginata Baissac

Plectropomus maculatus (Bloch)
Spotted coral Grouper

Body elongate; interorbital space flat except at edge of orbit where rounded; a pair of stout canine teeth at front of both jaws; side of lower jaw with 2 enlarged canine teeth; opercle with 3 flat spines; pelvic fin short; caudal fin emarginate. *Colour* : orange-red with dark-edged blue spots on head, body and median fins; no blue spots on lower thorax and abdomen; usually a single blue spot dorsally on pectoral fin base and another in axil; no blue spots on pelvic fins; a narrow whitish margin posteriorly on caudal fin. Attains 700 mm; Common between 200-650 mm; Caught with hook and line and gill nets; Inhabits in coral reef areas; Excellent food fish. Usually marketed fresh.

Plectropomus pessuliferus (Fowler)
Roving coral Grouper

Body elongate; interorbital space flat except at edge of orbit where rounded; a pair of stout canine teeth at front of both jaws; side of lower jaw with 2 enlarged canine teeth; opercle with 3 flat spines; pelvic fin short; caudal fin emarginate. *Colour* : brown to orange-red with numerous small dark-edged blue spots on head, body and fins; some spots on side of body of adults vertically elongate and some on head diagonally elongate. Attains 650 mm; Common between 200-600 mm. Caught with hook and line and gill nets; Found in coral reef areas; Indo-Pacific; Excellent food fish. Usually marketed fresh.

Variola albimarginata Baissac
Lyre tail Grouper

Body elongate; interorbital space slightly convex; 1-2 large canine teeth on midside of lower jaw; in addition to band of villiform teeth and anterior pair of canines; pelvic fin usually not reaching anus; caudal fin lunate. *Colour* : body with irregular horizontal to oblique red bands alternating with narrower yellow lines, the red bands containing small irregular pink spots; head orange-yellow with numerous small pale blue to pink spots; caudal fin with a narrow hyaline margin centroposteriorly. Attains 550 mm; Common between 200-450 mm. Caught with hook and line and gill nets; Found in coral reef areas; Indo-West Pacific; Excellent food fish. Usually marketed fresh.



Variola louti (Forsskal)

Variola louti (Forsskal)**Coronation Grouper**

Body elongate; interorbital space slightly convex; 1-2 large canine teeth at midside of lower jaw, in addition to inner band of small teeth and a pair of anterior canines; pelvic fins of adults extending posterior to anus; caudal fin lunate. *Colour* : head and body yellowish brown to orange-red with numerous small irregular spots or dashes which vary from blue to pink; spots on head often smaller, more round and more close-set than on body; a broad yellow crescent centroposteriorly in caudal fin and a yellow zone posteriorly on dorsal and anal fins. Attains 850 mm; Common between 150-550 mm; Caught with hook and line and gill nets; Found in coral reef areas; Indo-Pacific; Excellent food fish. Usually marketed fresh.



Aphareus furca (Lacepede)



Aphareus rutilans Cuvier



Aprion virescens Valenciennes

SNAPPERS*Aphareus furca* (Lacepede)***Small toothed jobfish***

Body elongate, fusiform and compressed; lower jaw protruding; maxilla extending to below middle of eye; teeth in jaws small; roof of mouth toothless; caudal fin forked. *Colour* : steel blue; edges of preopercle and opercle outlined with black. Attains 30-40 cm. Caught mainly with handlines. Inhabits inshore coral reefs, solitarily or in small groups. Tropical Indo-Pacific. Often seen in markets. Marketed fresh.

Aphareus rutilans Cuvier***Rusty jobfish***

Body elongate, fusiform and compressed; lower jaw protruding, maxilla extending to below middle of eye; teeth small; roof of mouth toothless; caudal fin deeply forked. *Colour* : head and body red or pink dorsally; inside of mouth, gill chamber and gills shining silver; margin of maxilla black. Attains 80 cm. Caught mainly with handlines and bottom longlines. Inhabits reef and rocky bottom areas. Tropical Indo-Pacific. An important market fish in these Islands. Marketed fresh.

Aprion virescens Valenciennes***Green jobfish***

An elongate, robust fish with rounded body; a distinct groove in front of eye; teeth in both jaws in bands, with two strong canines anteriorly; vomerine tooth patch crescent shaped; pectoral fins short, equal to snout; caudal fin deeply forked. *Colour* : dark green to bluish or blue-grey. Attains 100 cm. Caught mainly with handlines and bottom longlines. Inhabits inshore reefs areas. Tropical Indo-Pacific. Frequently seen in markets. Marketed mostly fresh, also dried and salted.



Etelis carbunculus Cuvier



Etelis coruscans Valenciennes



Etelis radiosus Anderson

Etelis carbunculus Cuvier

Ruby Snapper

Body relatively elongate; head small eye large; interorbital space flat; lower jaw projecting; a single row of conical teeth in jaws, usually one or two pair of enlarged canines anteriorly; caudal fin forked. *Colour* : mainly pink to red becoming white on lower sides and belly. Attains 80 cm. Caught mainly with bottom longlines and deep handlines. Inhabits rocky bottom areas. Tropical Indo-Pacific. An important food fish. Marketed mostly fresh.

Etelis coruscans Valenciennes

Ruby Snapper

Body slender and elongate; head small, eye large; snout short; interorbital space flat; lower jaw slightly projecting; jaws with bands of small teeth; vomerine tooth patch V-shaped; caudal fin deeply forked, upper lobe greatly elongate. *Colour* back and upper sides deep pink to red, lower sides and belly pink; fins pink to red. Attains 70 cm. Caught with deep handlines. Inhabits rocky bottom areas. Tropical Indo-Pacific. An important food fish. Marketed fresh.

Etelis radiosus Anderson

Pale Snapper

Body slender and elongate; head small, eye large; snout short; interorbital space flat; lower jaw projecting; jaws with bands of small conical to canine teeth; vomerine tooth patch arch shape; caudal fin forked. *Colour* : mainly red, lighter on lower sides and belly. Attains 60 cm. Caught with deep handlines. Inhabits rocky bottom areas. Tropical Indo-Pacific. An important food fish. Marketed fresh.



Lipocheilus carnolabrum (Chan)



Lutjanus argentimaculatus (Forsskal)



Lutjanus bengalensis (Bloch)

Lipocheilus carnolabrum (Chan)**Tang's Snapper**

Body moderately deep; mouth large the upper jaws protruding when mouth closed; adults with a thick protrusion at anterior end of upper lip; maxilla without scales; vomer and palatines with teeth; caudal fin moderately forked. *Colour* : back and upper part of head brown, yellowish to pinkish on sides; a silvery sheen on ventral portion of body. Attains 60 cm. Caught mainly with longlines and handlines. Occurs over rocky bottom areas. Tropical Indo-Pacific. The large species are good eating. Marketed mostly fresh.

Lutjanus argentimaculatus (Forsskal)**Mangrove red Snapper**

Body moderately deep; snout somewhat pointed; preopercular notch and knob poorly developed; vomerine teeth patch crescentic, without a medial posterior extension; tongue with a patch of granular teeth; posterior profile of dorsal and anal fins rounded; caudal fin emarginate to nearly truncate. *Colour* : body deep red, paler on belly; each scale on sides of body usually with a silvery spot in the centre. Attains 120 cm. Caught mainly with handlines and gill nets. A coastal species, the juveniles and young adult found in mangrove areas. Indo-West Pacific. An important market species in these Islands. Marketed fresh, also dried and salted, flesh excellent.

Lutjanus bengalensis (Bloch)**Bengal Snapper**

Body fusiform, slender to moderately deep, snout somewhat pointed; preopercular notch and knob well developed; Vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth without teeth; caudal fin emarginate; *Colour* : back and sides yellowish; belly whitish; sides with a series of 4 bright blue stripes; fins yellow to whitish. Attains 30 cm. Caught mainly with handlines and gill nets. Mainly inhabits coral reef areas; sometimes around rocky areas. Northern Indian Ocean from Sumatra to East Africa and the Red Sea. Found in small quantities in markets of these islands. Marketed mostly fresh, flesh is of good quality.



***Lutjanus biguttatus* (Valenciennes)**



***Lutjanus bohar* (Forsskal)**



***Lutjanus carponotatus* (Richardson)**

Lutjanus biguttatus* (Valenciennes)*Two-spot banded Snapper**

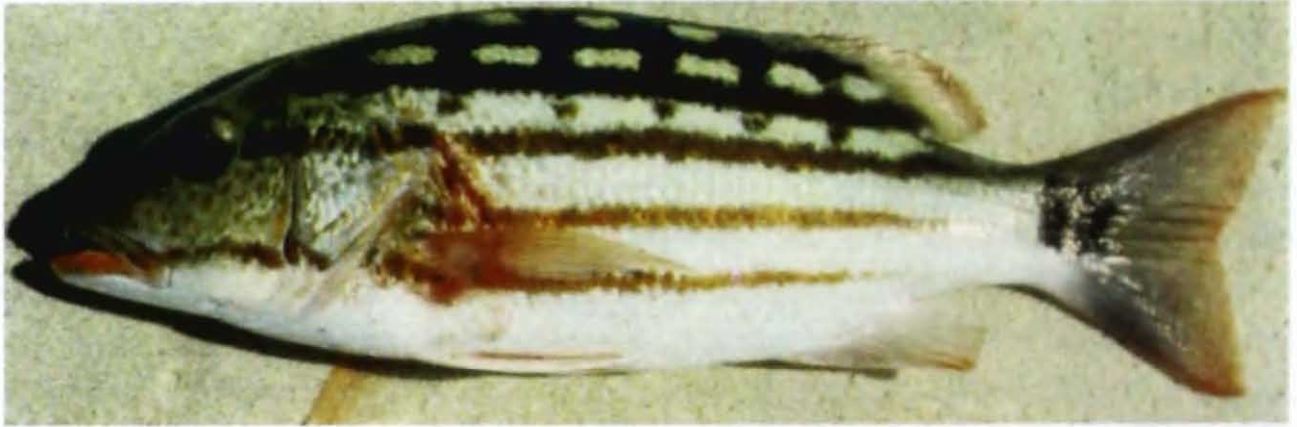
Body fusiforms, very slender; snout profile low, sloping very gently; preopercular notch and knob poorly developed; Vomerine tooth patch triangular with a medial posterior extension; tongue smooth with teeth; caudal fin truncate. *Colour* : body dark brown, belly yellowish; a broad pearly-white stripe from eye to base of caudal fin, two small white spots above lateral line, one below base of 7th dorsal spine and one below middle of soft part of dorsal fin. Attains 20 cm. Caught mainly with handlines and gill nets. Inhabits coral reefs, sometimes occurs in large schools. Indo-Australian Archipelago. An important market fish in small quantities. Marketed mostly fresh.

Lutjanus bohar* (Forsskal)*Two spot Red Snapper**

Body moderately deep, snout somewhat pointed; vomerine tooth patch crescentic without a medial posterior extension; tongue with a patch of granular teeth; posterior profile of dorsal and anal fins rounded; caudal fin slightly emarginate. *Colour* : body red or purplish red with darker horizontal stripes; fins dusky except pectoral fins pink with black dorsal edges. Attains 75 cm. Caught mainly with handlines and gill nets. Inhabits coral reefs. Indo-West Pacific. An important market fish. Marketed mostly fresh, also dried salted.

Lutjanus carponotatus* (Richardson)*Spanish flag Snapper**

Body moderately deep; snout somewhat pointed; dorsal profile of head steeply sloped; preopercular notch and knob poorly developed; Vomerine tooth patch triangular, with a medial posterior extension; tongue with a patch of granular teeth, posterior profile of dorsal and anal fins rounded; caudal fin emarginate. *Colour* : back and upper sides brownish; lower sides and belly white; a series of 8 or 9 orange strips on sides; fins yellowish. Attains 40 cm. Caught mainly with handlines and gill nets. Inhabits coral reefs. Western Pacific and Northeastern Indian Ocean. Occasionally seen in markets. Marketed fresh.



Lutjanus decussatus (Cuvier)



Lutjanus ehrenbergii (Peters)



Lutjanus erythropterus Bloch

Lutjanus decussatus (Cuvier)
Checkered Snapper

Body moderately deep; dorsal profile of head moderately sloped; vomerine tooth patch crescentic, without a medial posterior extension; tongue with a patch of granular teeth; posterior profile of dorsal and anal fins rounded; caudal fin slightly emarginate. *Colour* : silvery with a checker-board pattern on upper half of sides, consisting of dark brown bars and stripes; lower half of sides with 2 dark brown stripes; a large black blotch on caudal fin base. Attains 30 cm. Caught mainly with handlines and gill nets. Inhabits coral reefs. Commercially important species, regularly seen in markets of these islands. Marketed mostly fresh.

Lutjanus ehrenbergii (Peters)
Blackspot Snapper

Body moderately deep to somewhat slender; dorsal profile of head moderately sloped; preopercular notch and knob poorly developed; Vomerine tooth patch triangular with a medial posterior extension; tongue with a patch of granular teeth; caudal fin truncate or slightly emarginate. *Colour* : lemon yellow grading to white on lower sides and head; 4 or 5 narrow yellow-brown stripes on sides, below lateral line; a large black spot on lateral line below anterior soft dorsal rays; fins yellow. Attains 35 cm. Caught mainly with handlines and gill nets. Inhabits coral reefs and in mangrove estuaries. Indo-West Pacific. Commonly seen in markets of these islands. Marketed mostly fresh.

Lutjanus erythropterus Bloch
Crimson Snapper

Body moderately deep; dorsal profile of head sloped; mouth relatively developed; vomerine tooth patch crescentic or triangular, without a medial posterior extension; tongue smooth without teeth; posterior profile of dorsal and anal fins rounded; caudal fin emarginate. *Colour* : red, including fins. Attains 60 cm. Caught mainly with handlines. Inhabits coral reefs. Indo-West Pacific. An excellent food fish, seen in markets of these islands but usually in small quantities. Marketed fresh or dried-salted.



Lutjanus fulviflamma (Forsskal)



Lutjanus fulvus (Schneider)



Lutjanus gibbus (Forsskal)

Lutjanus fulviflamma* (Forsskal)*Blackspot Snapper**

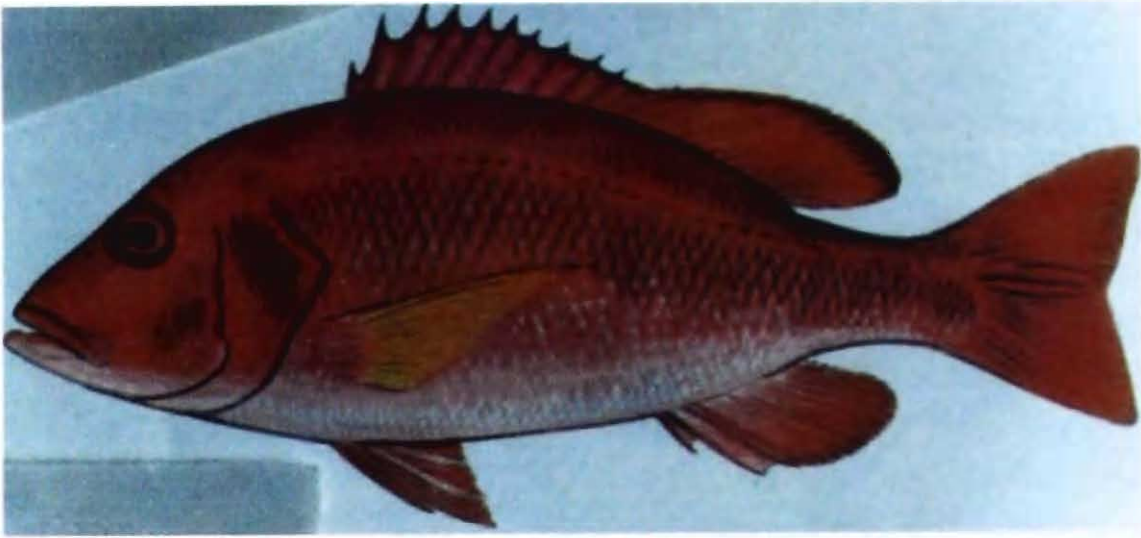
Body moderately deep to somewhat slender; dorsal profile of head moderately sloped; preopercular notch and knob poorly developed; vomerine tooth patch triangular, with a medial posterior extension; tongue with a patch of granular teeth; caudal fin truncate or emarginate. *Colour* : silvery with 6 or 7 yellow lines along scale rows; a prominent black spot on lateral line below anterior soft dorsal rays; fins yellowish. Attains 35 cm. Caught mainly with handlines and gillnets. Inhabits coral reef, rocky areas, also in mangrove estuaries and over muddy bottoms. Indo-West Pacific. A small species, seen frequently in markets of these islands. Marketed usually fresh.

Lutjanus fulvous* (Schneider)*Blacktail Snapper**

Body robust; dorsal profile of head steeply sloped; preopercular notch and knob well developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth; without teeth; Posterior profile of dorsal and anal fins rounded, caudal fin slightly emarginate. *Colour* : back and sides bronze with 6 distinct horizontal golden bands and thinner ones between these; belly and underside of head whitish; soft dorsal and caudal dusky submarginally with a distinct white edge; other fins yellow. Attains 40 cm. Caught mainly with handlines and gillnets. Inhabits coral reefs. Indo-Pacific. Commonly seen in markets. Marketed usually fresh.

Lutjanus gibbus* (Forsskal)*Humpback red Snapper**

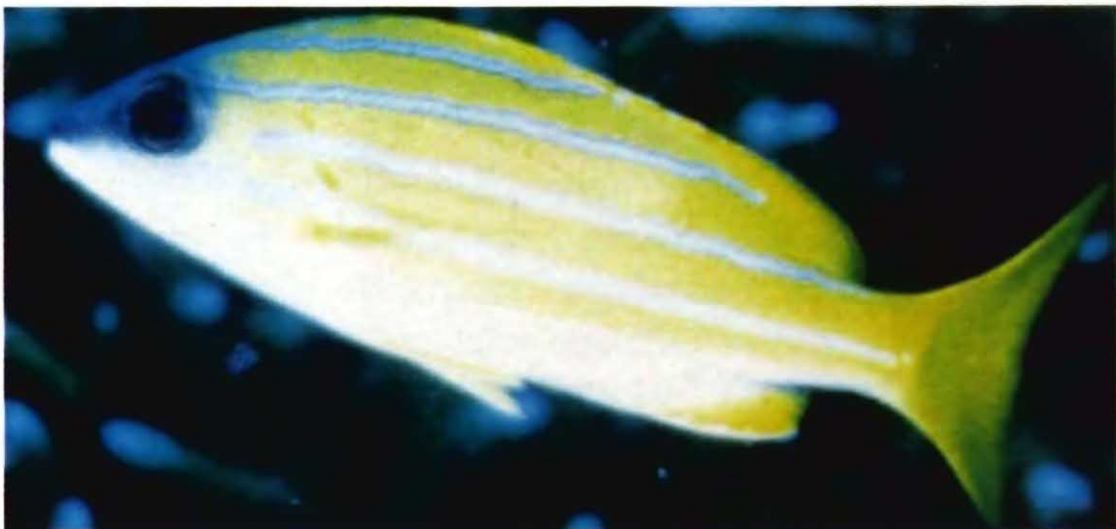
Body relatively deep, dorsal profile of head steeply sloped; preopercular notch and knob well developed; vomerine tooth patch crescentic; without a medial posterior extension; tongue smooth without teeth, posterior profile of dorsal and anal fins pointed; caudal fin distinctly forked with rounded lobes. *Colour* : generally grey to deep red grading to silver below; eye and pectoral base axil orange; median fins dusky red with narrow white margin. Attains 150 cm. Caught mainly with handlines and gillnets. Mainly inhabits coral reefs and rocky areas. Indo-West Pacific. Commonly seen in markets. Marketed fresh.



Lutjanus guilcheri Fourmanoir



Lutjanus johnii (Bloch)



Lutjanus kasmira (Forsskal)

Lutjanus gilchери Fourmanoir
Yellow fin red Snapper

Body moderately deep, dorsal profile of head steeply sloped, preopercular notch and knob poorly developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth, without teeth; posterior profile of dorsal and anal fins rounded; caudal fin truncate or slightly emarginate. *Colour* : reddish-orange; median fins reddish, with yellow diffusion and narrow black borders; pelvic fins red; pectoral fins yellow. Attains 60 cm. Caught mainly with handlines. Inhabits over rocky bottoms. Madagascar, Sri Lanka and the Bay of Bengal. Potential interest to fisheries. Commonly seen in markets of these islands. Marketed mainly fresh.

Lutjanus johnii (Bloch)
John's Snapper

Body moderately deep; dorsal profile of head steeply sloped; preopercular notch and knob poorly developed; vomerine tooth patch crescentic, without a patch of granular teeth; posterior profile of dorsal and anal fins rounded; caudal fin truncate or slightly emarginate. *Colour* : body silvery green or bronze-red, with a distinct dark spot on each scale, giving an overall appearance of series of horizontal lines on side of body; a dark blotch often present, mainly above lateral line, below anterior soft dorsal rays. Attains 70 cm. Caught mainly with handlines and gillnets. Shallow coastal waters, including mangrove areas. Indo-West Pacific. Frequently found in markets. Marketed fresh or dried-salted.

Lutjanus kasmira (Forsskal)
Blubanded Snapper

Body moderately deep, dorsal profile of head steeply sloped; preopercular notch and knob well developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth, without teeth; posterior profile of dorsal and anal fins angular; caudal fin emarginate. *Colour* : bright yellow including fins; head and body white ventrally; 4 bright blue stripes on side; a large black spot sometimes present on lateral line below anterior soft dorsal rays. Attains 35 cm. Caught mainly with handlines and gillnets. Found on coral and rocky reefs. Indo-Pacific. Frequently found in markets. It is one of the principal species in the fishery of these islands. Marketed usually fresh.



Lutjanus lemniscatus (Valenciennes)



Lutjanus lunulatus (Park)



Lutjanus lutjanus (Bloch)

***Lutjanus lemniscatus* (Valenciennes)**
Yellow strecked Snapper

Body moderately deep; dorsal profile of head steeply sloped; preopercular notch and knob poorly developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue with a patch of granular teeth; caudal fin truncate or slightly emarginate. *Colour* : dusky brown grading to white or pinkish below; dorsal and caudal fins brownish, remaining fins pink or reddish. Attains 65 cm. Caught mainly with handlines. Usually found over coral reefs. Indo-West Pacific. An important market species of these islands. Marketed mostly fresh. Sometimes dry-salted.

***Lutjanus lunulatus* (Park)**
Lunartail Snapper

Body moderately deep; dorsal profile of head steeply sloped; preopercular notch and knob poorly developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue with a patch of granular teeth; posterior profile of dorsal and anal fins angular; caudal fin slightly emarginate. *Colour* : body brown, whitish below; caudal fin with a broad, crescentic black band with the posterior portion of fin pink; pectoral, anal and pelvic fins yellow. Attains 35 cm. Caught mainly with handlines and gillnets. Inhabits coral reefs. Western Pacific and Northern Indian Ocean. Seen in markets of these islands not frequently. Marketed fresh.

***Lutjanus lutjanus* (Bloch)**
Bigeye Snapper

Body fusiform, slender; dorsal profile of head gently sloped; preopercular notch and knob poorly developed; vomerine tooth patch triangular, with a medial posterior extension; tongue with a patch of granular teeth; posterior profile of dorsal and anal fins angular; caudal fin truncate or slightly emarginate. *Colour* : silvery to bronzy with horizontal yellow to brown lines on flanks and similar lines running obliquely above lateral line; fins pale yellow to whitish. Attains 30 cm. Caught mainly with handlines. Inhabits coastal waters, including reef areas. Indo-West Pacific. One of the common snapper found in markets of these islands. Marketed mostly fresh.



Lutjanus madras (Valenciennes)



Lutjanus malabaricus Schneider



Lutjanus monostigma (Cuvier)

Lutjanus madras (Valenciennes)
Indian Snapper

Body fusiform, somewhat slender; preopercular notch and knob poorly developed; vomerine tooth patch triangular with a medial posterior extension, tongue with a patch of granular teeth; posterior profile of dorsal and anal fins angular; caudal fin truncate or slightly emarginate. *Colour* : upper back brownish, sides whitish with a series of fine yellow horizontal lines on lower half of body and similar brownish lines running obliquely above lateral line; fins yellow. Attains 30 cm. Caught mainly with handlines and gillnets. Inhabits coral and rocky reefs. Western Pacific and Indian Ocean. Common in markets of these islands. Usually marketed fresh.

Lutjanus malabaricus Schneider
Malabar red Snapper

Body relatively deep; dorsal profile of head steeply sloped; preopercular notch and knob poorly developed; vomerine tooth patch crescentic without a medial posterior extension; tongue smooth, without teeth; caudal fin truncate. *Colour* : back and sides red, lighter on lower parts; fins reddish. Attains 100 cm. Caught mainly with handlines. Inhabits both coastal and offshore reefs. Indo-West Pacific. Found in markets of these islands. Marketed fresh or dried-salted.

Lutjanus monostigma (Cuvier)
One-spot Snapper

Body moderately deep to somewhat slender; preopercular notch and knob poorly developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth, without teeth; caudal fin somewhat emarginate. *Colour* : generally grey to yellowish with dusky scale margins; black spot usually present on lateral line, below anterior dorsal rays; fins yellow. Attains 60 cm. Caught mainly with handlines and gill nets. Inhabits coral reef areas. Indo-Pacific. An important market fish of these islands. Marketed mostly fresh.



***Lutjanus quinquelineatus* Bloch**



***Lutjanus rivulatus* (Cuvier)**



***Lutjanus russelli* (Bleeker)**

Lutjanus quinquelineatus Bloch
Fivelined Snapper

Body moderately deep; dorsal profile of head steeply sloped; preopercular notch and knob well developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth, without teeth; caudal fin slightly emarginate. *Colour* : upper part of head brownish; sides and belly bright yellow, a series of 5 bright blue stripes on sides; a round black spot present at level of lateral line, below anterior dorsal rays; fins yellow. Attains 35 cm. Caught mainly with handlines and gillnets. Inhabits coral reef areas. Indo-Pacific. Commonly found in markets of these islands. Marketed mostly fresh.

Lutjanus rivulatus (Cuvier)
Blubberlip Snapper

Body very deep; dorsal profile of head steeply sloped; preopercular notch and knob moderately developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth without teeth; posterior profile of dorsal fin rounded and of anal fin pointed; caudal fin truncate or slightly emarginate. *Colour* : generally olive-brown on back, silvery on sides; head with numerous wavy white or bluish bands; pearly blotch with black edge on lateral line below anterior dorsal rays; fins yellowish. Attains 65 cm. Caught with handlines and gill nets. Found over coral and rocky reefs. Indo-Pacific. Frequently found in markets of these islands. Marketed mostly fresh.

Lutjanus russelli (Bleeker)
Russell's Snapper

Body moderately deep to somewhat slender; preopercular notch and knob poorly developed; vomerine tooth patch triangular, with a medial posterior extension; tongue with a patch of granular teeth; scales on top of head begin behind eyes; posterior profile of dorsal and anal fins rounded; caudal fin truncate or slightly emarginate. *Colour* : generally yellow-brown above grading to pinkish below; a black spot below anterior dorsal rays and mostly above lateral line; sides usually with about 8 brownish bands, lower ones horizontal and upper ones rising obliquely to dorsal profile; fins yellow. Attains 40 cm. Caught with handlines and gill nets. Inhabits rocky and coral reef areas. Indo-West Pacific. A common market species of these islands. Marketed mostly fresh.



Lutjanus sanguineus (Cuvier)



Lutjanus sebae (Cuvier)



Lutjanus vitta (Quoy & Gaimard)

Lutjanus sanguineus (Cuvier)**Humphead Snapper**

Body relatively deep; dorsal profile of head angular, snout steeply sloped; adults with horizontal grooves, behind and below eye; vomerine tooth patch crescentic, without a meidal posterior extension; tongue smooth; caudal fin truncate or slightly emarginate. *Colour* : generally rich orange red with silver belly; fins red to pink. Attains 80 cm. Caught mainly with handlines and longlines. found on coral and rocky reefs. Western Indian Ocean south to Algoa Bay. An excellent food fish frequently seen in markets. Marketed mostly fresh.

Lutjanus sebae (Cuvier)**Emperor Red Snapper**

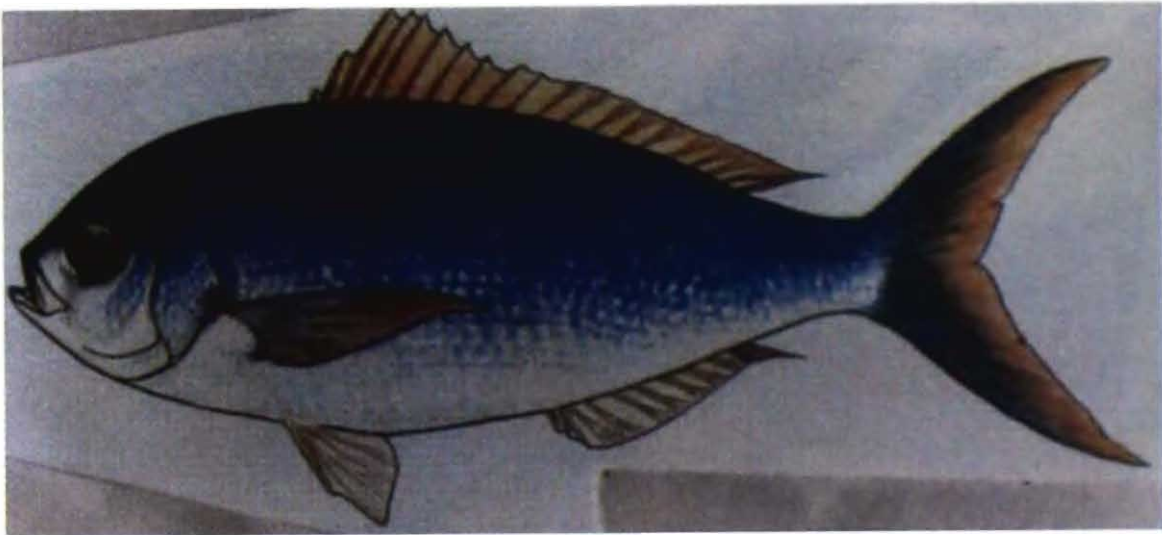
Body very deep; dorsal profile of head steeply sloped; preopercular notch and knob moderately developed; vomerine tooth patch crescentic, without a medial posterior extension; tongue smooth without teeth; posterior profile of dorsal and anal fins pointed; caudal fin somewhat emarginate. *Colour* : body deep red in adults; juveniles and subadults pink with a dark red band from first dorsal spine through eye to tip of snout; a second band from middle of spinous part of dorsal fin to pelvic fin; and a third band from base of last dorsal spine running obliquely downward across caudal peduncle and along lower edge of caudal fin. Attains 100 cm. Caught with handlines. Usually found on coral and rocky reefs. Juveniles sometimes found in mangrove estuaries. Indo-West Pacific. Often found in markets of these islands. Marketed mostly fresh, but also dried-salted.

Lutjanus vitta (Quoy & Gaimard)**Brownstripe Red Snapper**

Body moderately deep to relatively slender; dorsal profile of head moderately sloped; preopercular notch and knob poorly developed; vomerine tooth patch triangular with a medial posterior extension; tongue with a patch of granular teeth; posterior profile of dorsal and anal fins angular; caudal fin slightly emarginate or truncate. *Colour* : Upper sides and back brown, lower sides and belly whitish with narrow longitudinal brown lines on sides, those above lateral line oblique dark brown lines; a blackish stripe along of side from eye to upper half of caudal peduncle; fins yellow. Attains 40 cm. Caught mainly with handlines. Inhabits rocky and coral reef areas. Western Pacific and Indian Ocean. A common snapper frequently found in markets. Marketed mostly fresh.



Macolor niger (Forsskal)



Paracaesio sordidus Abe & Shinohara



Paracaesio xanthurus (Bleeker)

Macolor niger (Forsskal)
Black and White Snapper

Body relatively deep; head profile markedly convex; preopercle with deep notch receiving elongate interopercular knob; a row of conical teeth in jaws; vomerine tooth patch broadly V-shaped; gill rakers on lower limb of first arch including rudiments about 60 to 70; posterior lobes of dorsal and anal fins pointed; caudal fin emarginate. *Colour* : adults uniformly blackish with a yellow iris. Attains 60 cm. Caught with handlines and gill nets. Inhabits coral reefs. Tropical Indo-Pacific. Frequently seen in markets. Marketed mainly fresh.

Paracaesio sordidus Abe & Shinohara
Blue Snapper

Body moderately deep, fusiform; eye large; snout short; upper and lower jaws about equal; both jaws with an outer series of well developed canine teeth and an inner band small villiform teeth; maxilla scaleless; pectoral fins long, reaching level of anus; caudal fin deeply forked. *Colour* : overall dark purplish-brown to bluish; silvery on lower sides and belly; dorsal and caudal fins brownish; other fins whitish. Attains 40 cm. Caught mainly with handlines. Occurs over rocky bottoms. Indo-Pacific. An important food fish. Usually marketed fresh.

Paracaesio xanthurus (Bleeker)
Yellowtail Blue Snapper

Body moderately deep, fusiform; eye large, snout short; upper and lower jaws about equal; both jaws with an outer series of well developed canine teeth and an inner band of small villiform teeth; dorsal and anal fins scaleless; pectoral fins long, reaching level of anus; caudal fin deeply forked. *Colour* : upper part of body and caudal yellow; head and rest of body blue. Attains 40 cm. Caught mainly with handlines and bottom longlines. Occurs over rocky bottoms. Indo-Pacific. Minor fishery value. Marketed fresh.



Pinjalo pinjalo (Bleeker)



Pinjalo lewisi Randall, Allen & Anderson



Pristipomoides filamentosus (Valenciennès)

Pinjalo pinjalo (Bleeker)**Pinjalo Snapper**

Body moderately deep; dorsal profile of head high; eye large; snout short and pointed; mouth small; a single row of small, conical teeth in jaws and an inner band of villiform teeth; caudal fin emarginate. *Colour* : Body pink or red, silvery on lower sides and belly; dorsal, anal, caudal and pelvic fins frequently with black margin; pelvic and anal fins yellowish. Attains 50 cm. Mainly caught by handlines. Inhabits coral reefs and rocky areas. Indo-West Pacific. An important market fish, but caught in small amounts, marketed mostly fresh.

Pinjalo lewisi Randall, Allen & Anderson**Slender Pinjalo**

Body moderately deep; dorsal profile of head high; interorbital space convex; eye relatively large, with an adipose eye lid; snout short, mouth small; a single row of small, conical teeth in jaws and an inner band of villiform teeth; caudal fin emarginate. *Colour* : pink or red on back, whitish on lower sides and belly; a white spot generally present on upper half of caudal peduncle; dorsal and caudal fins reddish, often with a narrow black margin; pelvic and anal fins pink. Attains 50 cm. Mainly taken with handlines. Inhabits reef and rocky bottom areas. Tropical western Pacific and Indian Oceans. Caught in relatively small amounts. Marketed fresh.

Pristipomoides filamentosus (Valenciennes)**Crimson Jobfish**

Body elongate, robust; interorbital space flat; lower jaw slightly protruding; both jaws with an outer row of conical and canine teeth and an inner band of villiform teeth; vomerine tooth patch triangular; tongue without teeth; bases of dorsal and anal fins scaleless, their last soft rays extended into short filaments; caudal fin forked. *Colour* : mainly reddish; snout and interorbital space with narrow yellow lines and blue spots. Attains 80 cm. Caught mainly with bottom handlines and deep handlines. Occurs over rocky bottoms. Tropical Indo-Pacific. A good quality food fish. Marketed mainly fresh.



Pristipomoides multidentus (Day)



Pristipomoides sieboldii (Bleeker)



Pristipomoides zonatus (Valenciennes)

Pristipomoides multidens (Day)
Gold Banded Jobfish

Body elongate, robust; interorbital space flat; lower jaw slightly protruding; both with an outer row of conical teeth and an inner row of villiform teeth; vomerine tooth patch triangular; tongue without teeth; bases of dorsal and anal fins scaleless, their last soft rays extended into short filaments; caudal fin forked. *Colour* : yellowish to rosy, two golden bands bordered with dark blue on snout and cheek; transverse vermiculations on top of head; dorsal fin with yellowish striped or rows of spots. Caught mainly with handlines. Occurs over rocky bottoms. Tropical Indo-Pacific. An excellent food fish, often seen in markets, but usually in small quantities. Marketed fresh.

Pristipomoides sieboldii (Bleeker)
Lavender Jobfish

Body elongate, robust; interorbital space flat; lower jaw slightly protruding; both jaws with an outer band of conical and canine teeth and an inner band of villiform teeth; vomerine tooth patch diamond-shaped; teeth present on tongue; bases of dorsal and anal fins scaleless, their last soft rays extended into short filaments; caudal fin forked. *Colour* : silvery with lavender hue; dark spots on top of head; margin of dorsal fin orange. Attains 60 cm. Caught mainly with bottom longlines and deep handlines. Occurs over rocky bottoms. Tropical Indo-Pacific. A common foodfish, usually in small quantities. Marketed mostly fresh.

Pristipomoides zonatus (Valenciennes)
Oblique-banded Snapper

Body moderately deep; inter-orbital space convex; both jaws with bands of fine teeth; vomerine tooth patch V-shaped; tongue without teeth; bases of dorsal and anal fins scaleless; their last soft rays extended into short filaments; caudal fin forked. *Colour* : Reddish with alternating, oblique, red and yellow bars, dorsal and caudal fins yellow, other fins pink. Attains 50 cm. Caught mainly with handlines. Occurs over rocky bottoms. Tropical Indo-Pacific. Occasionally seen in markets. Marketed fresh.

GLOSSARY

Abdomen	:	Belly.
Analfin	:	The unpaired fin on the midline of the underside of the body, just behind the vent.
Anterior	:	In front of, or towards the head end.
Antrorse	:	Pointing forward.
Anus	:	Opening at the posterior end of the digestive tract.
Axilia	:	Space behind base of a fin.
Axillary	:	Pertaining to the gills.
Breast	:	The part of body situated between head and pectoral fin.
Canine teeth	:	Elongated conical teeth.
Caudal fin	:	The tail fin.
Caudal peduncle	:	The tapered, posterior part of the fishes body just in front of the tail fin.
Ctenoid scale	:	A scale with a rough, comb like or toothed margin.
Cycloid scale	:	A smooth edged, more or less circular scale with concentric striations.
Depth	:	The greatest vertical diameter of a fish.
Dorsal	:	The back or upper part of body opposite to ventral.
Dorsal fin	:	The unpaired fin or fins on the midline of the back.
Gill arches	:	The bony supports to which the gills are attached.
Gill rakers	:	A series of bony structures along the anterior edge of a gill arch, used to strain food from the water in many fishes.
Gills	:	The respiratory apparatus of fishes, found with in the gill openings.
Lateral	:	Pertaining to the side.
Lateral line	:	Longitudinal line on each side of fish's body, composed of pores opening into sensory organs.

- Mandible** : The lower Jaw.
- Maxilla** : The upper jaw.
- Opercle** : The gill cover.
- Opercular flap** : A fleshy extention of the rear edge of the opercle.
- Pectoral fins** : The paired fins attached to the shoulder girdle.
- Pelvic fins** : The paired fins placed behind or below the pectoral fins, also called as ventral fins.
- Premaxillaries** : The paired bones forming the front of the upper Jaw in fishes.
- Preopercle** : The anterior cheek bones.
- Snout** : That part of the head in front of the eyes.
- Ventral** : Relating to the under side of the body. The opposite of dorsal.
- Ventral fins** : Pelvic fins.

REFERENCES

- Allen, G. R. & J. H. Talbot, 1985, A review of the Snappers of the genus *Lutjanus* (Pisces; Lutjanidae) from the Indo-Pacific with the description of a new species. *Indo-Pacific fishes*. Honolulu, B. P. Bishop Museum.
- Allen, G. R. & R. C. Steene, 1987 *Reef fishes of the Indian Ocean*. Pacific Marine Fishes, Book 10 : 240 pp. T. F. H. Publications.
- Anderson, W. D., P. K. Talwar & G. D. Johnson, 1977, A replacement name for *Tangia chan* (Pisces : Perciformes : Lutjanidae) with redescription of the genus and type species *Proc. Biol. Soc. Wash.*; **89** : 509-18.
- Bleeker, P. 1874. Revision des especes indo-archipelagiques du groups des Epinephelini et. de quelques genres voisins. *Verh. Akad. Amsterdam* (1873) **14** : 1-134.
- Boulenger, G. A. 1895. *Catalogue of the fishes in the Indian Museum*. 2 ed. Vol. 1 : XIX + 391 pp. British Museum (Natural History), London.
- Cuvier & Valenciennes, 1828. *Histoire Naturelle des Poissons*. Vol. 2 : XXI + 490 pp. F. G. Levrault, Paris.
- Day, F. 1870, On the Fishes of the Andaman Island. *Proc. Zool. Soc. London* : 677-705.
- Day, F. 1889, *The fauna of British India including Ceylon and Burma*. Fishes, Vols. I and II, London.
- Fischer, W. and G. Bianchi (Eds.) 1984. *FAO Species identification sheets for fishery purpose*. Eastern India Ocean, (fishing area 51). FAO : Rome (Italy) Vols. 1-6.
- Fowler, H. W. and B. A. Bean, 1930. Contributions to the biology of the Philippine Archipelago and adjacent regions. The fishes of the Families Amiidae, and Serranidae, obtained by the United States Bureau of Fisheries Steamer "Albatross" Philippine Islands and adjacent seas. *Bull. U. S. Natl. Mus.* 100, Vol. **10** : IX + 334.
- Gunther, A., 1859. *Catalogue of the Acanthoptergian Fishes in the collection of the British Museum* Vol. I. : XXXI + 524 pp. British Museum, London.

- Jones, S. and M. Kumaran, 1980. *Fishes of the Laccadive Archipelago* : XII + 760 pp. Nature conservation and Aquatic Sciences Service, Trivandrum, Kerala, India.
- Jordan, D. S. and C. H. Eigenmann, 1890. A review of the genera and species of serranidae found in the waters of America and Europe. *Bull. U. S. Fish Comm.* (1888) 8 : 329-441.
- Katayama, M. 1974. Serranid fishes of the Okinawa Islands (11) *Bull. Fac. Educ. Yamaguchi Univ.* 24 : pt. 2 : 99-112.
- Masuda, H. K., Amakoa, C., Arage, T. Uyeno, & C. Yoshino. 1984. *The fishes of the Japanese Archipelago*. Faculty of Marine Science and Technology, Tokai University : Tokyo (Japan), 2 Vol. : 437 pp and 370 pp.
- Randall, J. E., G. R. Allen and R. C. Steena, 1990. *Fishes of the Great Barrier Reef and Coral Sea* : 507 pp. Crawford House Press, Bathurst, New South Wales.
- Randall, J. E. and P. C. Heemstra. 1991. Revision of Indo-Pacific Groupers. *Indo-Pacific Fishes* No. 20 : 1-332.
- Rao, Dv. Kamla Devi and P. T. Rajan. 1992. New records of Groupers (Family : Serranidae) from Andaman & Nicobar Islands. *J. Andaman Sci. Assoc.* 8(1) : 47-52.
- Smith, M. M. and P. C. Heemstra (Eds.) 1986. *Smith's Sea Fishes*. Macillian South Africa Ltd., 1047 pp.
- Talwar, F. K. and R. K. Kacker, 1984. *Commercial Sea Fishes of India* : Lii + 997 pp. Zoological Survey of India, Calcutta.
- Weber, M. and L. F. de Beaufort, 1931 & 1936. *The Fishes of the Indo-Pacific-Australian Archipelago*. Vol. 6 & 7 : XII + 448 pp & 607 pp.

SYSTEMATIC INDEX

- Aethaloperca rogae* 10, 14
Anyperodon leucogrammicus 10, 41
Aphareus furca 30, 71
Aphareus rutilans 30, 71
Aprion virescens 30, 71
Cephalopholis argus 2, 10, 19, 20, 41
Cephalopholis boenak 10, 20, 43
Cephalopholis cyanostigma 10, 20, 43
Cephalopholis formosa 10, 20, 43
Cephalopholis leopardus 10, 21, 45
Cephalopholis microprion 10, 20, 45
Cephalopholis miniata 10, 21, 45
Cephalopholis sonnerati 2, 10, 21, 47
Cephalopholis urodeta 10, 21, 47
Cromileptus altivelis 11, 47
Epinephelus areolatus 11, 22, 49
Epinephelus bleekeri 11, 22, 49
Epinephelus caerulepunctatus 11, 26, 49
Epinephelus chlorostigma 11, 22, 51
Epinephelus coioides 6, 11, 26, 51
Epinephelus corallicola 11, 25, 51
Epinephelus erythrurus 11, 26, 53
Epinephelus fasciatus 11, 26, 53
Epinephelus faveatus 11, 23, 53
Epinephelus flavocaeruleus 11, 22, 55
Epinephelus fuscoguttatus 11, 25, 55
Epinephelus hexagonatus 12, 24, 55
Epinephelus lanceolatus 2, 12, 22, 57
Epinephelus longispinis 12, 23, 57
Epinephelus macrospilos 12, 23, 57
Epinephelus malabaricus 6, 12, 26, 59
Epinephelus melanostigma 12, 25, 59
Epinephelus merra 12, 24, 59
Epinephelus miliaris 12, 24, 61
Epinephelus ongus 12, 27, 61
Epinephelus polyphekadion 12, 23, 61
Epinephelus polystigma 12, 26, 63
Epinephelus quoyanus 12, 23, 63
Epinephelus spilotoceps 13, 25, 63
Epinephelus tauvina 13, 26, 65
Epinephelus undulosus 13, 22, 65
Etelis carbunculus 31, 73
Etelis coruscans 31, 73
Etelis radiosus 31, 73
Lipocheilus carnolabrum 75
Lutjanus argentimaculatus 36, 75
Lutjanus bengalensis 75
Lutjanus biguttatus 32, 77
Lutjanus bohar 2, 34, 77
Lutjanus carponotatus 33, 77
Lutjanus decussatus 34, 79
Lutjanus ehrenbergii 35, 79
Lutjanus erythropterus 35, 79
Lutjanus fulviflamma 33, 81
Lutjanus fulvus 2, 34, 81
Lutjanus gibbus 2, 81
Lutjanus guilcheri 35, 83
Lutjanus johnii 36, 83
Lutjanus kasmira 32, 83
Lutjanus lemniscatus 35, 85
Lutjanus lunulatus 34, 85
Lutjanus lutjanus 31, 32, 85
Lutjanus madras 33, 87
Lutjanus malabaricus 35, 87
Lutjanus monostigma 2, 35, 87
Lutjanus quinquelineatus 32, 89
Lutjanus rivulatus 34, 89
Lutjanus russelli 33, 89
Lutjanus sanguineus 35, 91
Lutjanus sebae 34, 91
Lutjanus vitta 33, 91
Macolor niger 36, 93
Paracaesio sordidus 36, 93
Paracaesio xanthurus 37, 93
Pinjalo lewsi 33, 95
Pinjalo pinjalo 37, 95

Plectropomus areolatus 13, 27, 65
Plectropomus maculatus 13, 27, 67
Plectropomus pessuliferus 13, 27, 67
Pristipomoides filamentosus 38, 95
Pristipomoides multidens 37, 97

Pristipomoides sieboldii 38, 97
Pristipomoides zonatus 38, 97
Variola albimarginata 13, 28, 67
Variola louti 13, 28, 69

ANDAMAN AND NICOBAR ISLANDS

