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Recent Observations on Marine Fisheries Resources of Lakshadweep

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Abstract

The Union Territory of Lakshadweep has recently been in the limelight due to the special interest shown by the Government of India for overall development including fisheries. The research activities carried out since 1958 at Minicoy by CMFRI resulted in gathering of wealth of information on marine fisheries and environmental features. A recent survey conducted by the Institute made an overall assessment of the various types of fishery resources, their potential and the impact of environmental damage on the ecosystems.

The skipjack and yellowfin tunas caught in pole and line formed the mainstay of economy of the islanders. The catch increased from 571 t in 1970 to 5000 t at present. Agatti and Bitra accounted for nearly 60% of the total tuna catch. The demand for live-baits, essential for pole and line fishing has also increased. The two species of sprats are the most sought after live bait. The environmental damage, both natural and otherwise, has affected their availability in some islands.

The lagoons and the surrounding sea abounds in a variety of food fishes like goatfishes, silver biddies, perches, barracudas, carangids, seerfishes, sharks, rays, etc. Fairly good resources of marine ornamental fishes were observed in various islands indicating potential for export market. The crustacean resources are meagre. A variety of echinoderms occur and some of them are considered to be good for *Beche-de-mer* industry. The Octopus, fished by the fishermen in all islands affords a sustenance fishery. A variety of mulluscan shells of ornamental value are also exploited.

Though a variety of seaweeds are present, their occurrence, abundance and the exploitable quantity vary in different islands. The corals and coral reefs are integral part of the islands. They are partially devastated in some islands due to human interference or natural causes causing not only sea erosion but upsetting the ecosystems with far reaching effects on fisheries resources.

The scope for mariculture as well as the possibilities of establishing marine parks are indicated. The prospects for further development of fisheries in Lakshadweep are discussed.

Introduction

The Union Territory of Lakshadweep has recently been in the lime-light due to the special interest shown by the Government of India for overall development including fisheries. The interest in development of the living resources of this island territories has revived the efforts to study the resources and their potentials in a systematic manner. The Central Marine Fisheries Research Institute (CMFRI) established a Research Centre at Minicoy in 1958 and since then carried out extensive studies on the biology of tunas, live-bait fishes, coral reefs and fishery oceanography. A historical resume of the marine fisheries research in Lakshadweep has been given by James *et al.* 1986.

The Lakshadweep group of islands lying between Lat. 8° – 12° 13'N and Long. 71° – 74°E consists of 10 inhabited islands and 17 uninhabited islets with a total area of 28.5 sq. km and around them is water spread of 73 million sq. km. (Fig. 1). The inhabited islands are Agatti, Amini, Androth, Bitra, Chetlat, Kadmat, Kalpeni, Kavaratti, Kiltan and Minicoy. Except Androth all islands have a lagoon which abounds in wide variety of flora and fauna. The vast stretches of waters around the island are rich in tunas and other food fishes. Tunas, exploited by pole and line fishing using live-baits, and the associated *masmin* trade formed the mainstay of the economy of the islands. Two species of sprats are the most sought after live-baits.

Recently the CMFRI conducted an indicative survey which indicated good resource potential for tunas and food fishes. A variety of ornamental fishes observed offer potential for export market. The crustacean resources have been found to be meagre. A number of echinoderms occur and some of them are considered to be good for *Beche-de-mer* industry. Molluscan shells of ornamental value are exploited in some of the islands. The octopus fished by the fishermen in all islands affords a sustenance fishery. Though the seaweeds are also present, their occurrence, abundance and the exploitable quantity vary in different islands. The corals and coral reefs are integral part of the islands. Due to human interference and natural causes, they are particularly devastated in some islands causing not only sea erosion but upsetting the ecosystem. The scope for mariculture as well as the possibilities of establishing marine parks are indicated. The need for conservation and prospects for further development of fisheries in Lakshadweep are discussed.

Marine fisheries resources

The marine fisheries resources of Lakshadweep comprise the oceanic resources such as tunas, bill fishes, pelagic sharks etc., and other groups of food fishes, the bait fishes and ornamental fishes inhabiting the reefs and numerous lagoons play a vital role in the economy of the

islands. The total marine fish catches in the islands have risen from 2931 t in 1975 to 5794 t in 1984-85. The annual marine fish production during the last few years (1975 to 1985-86) is given in Table 1. The average for the said period showed that tunas formed 70.6% followed by elasmobranchs (7.7%) and perches (6.0%). Average landings of major groups of fishes and their respective percentage contribution is given in Fig. 2.

Tuna resources

The skipjack *(Katsuwonus pelamis)* and yellowfin constitute the major tuna resources in the oceanic waters of Lakshadweep and are exploited by the pole and line units using live-baits. This method has been in vogue since long at Minicoy and has now been adopted in other islands. The progressive mechanisation has resulted in increased catch. The total catch of tunas increased from 571 t in 1970 to 4,842 t in 1984-85. The studies conducted at Minicoy indicated that the catch per standard effort was high during the period 1970-80 (514 kg) and in subsequent years fluctuated between 242 to 334 kg (James and Pillai, 1987).

The landings of tunas at Agatti, Kavaratti, Minicoy, Androth and Bitra respectively were 2570, 797, 503, 202 and 182 t during 1984-85 (Anon, 1986). In the other islands the total production ranged from 55 to 132 tonnes. Varghese and Shanmugham (1987) has indicated that Agatti, Minicoy and Bitra contributed to 63.4%, 27.3% and 9.3% to the tuna catch. Areas like Agatti, Bitra, Suheli, Perumul par, Valiyapani, Cheriapani, Kadmat and Kalpeni showed high concentration of skipjack shoals. Presently there are 55 pole and line units in Agatti. The catch at Agatti has increased from 179 tonnes in 1971 to a record catch of 2054 tonnes in 1984. Though the C/E were low during the earlier years, it increased considerably and is now around 600 kg. The C/E as high as 1091 kg was recorded in 1984. The percapita income in the island from fishing is around Rs. 3000/-.

The survey conducted by the Institute recently indicated tuna fishing around Amini, Kadmat, Kiltan and Chetlat but was poor except around Kadmat. Paucity of live-baits may be one of the reasons for poor tuna fishing. The author made an on the spot study of the pole and line fishing at Agatti. The tuna shoal had a radius of 200 m. The hooking rate was found to be poor. Examination of the gut content of the fishes caught showed that the stomachs were full (90%) of the carridean shrimp *(Leptochela robusta)*. The factors that determine the variations in the hooking rate, whether it be the presence or absence of forage fishes in water at the time when fishermen supply the live-bait or the condition of feed at the time of fishing or even environmental, need detailed study (James *et al.* 1987 a).

The *masmin* is the major product of Lakshadweep. The production ranges from 35-100 tonnes of 'mas' in each of the major islands. The local people prepare a kind of concentrate known as *Riha akuru*. The sale of *masmin* from the islands earns more than Rs.150 lakhs annually. About $\frac{1}{2}$ kg of body weight of tuna (4-5 kg) are discarded as waste at Agatti and Bitra in the indigenous processing. Conversion of the waste into fish meal or ensilage would be beneficial (James *et al.* 1987 a). In addition, the wastes could be profitably used as bait for shark fishing which is expected to develop as an important resource in the region. In view of the economical returns, quality improvement and steady market for *masmin* chiefly in the main land of India, and export should be explored and developed. (James and Pillai 1987). At Minicoy about 70 tonnes of tunas are canned annually and there exists scope for tuna canneries especially in Agatti.

The skipjack tuna resources of this area is estimated to be 50,000 t (George *et al.* 1977). There also exists an equal quantity of sub-surface tunas. Recently, the present trend, constraints and strategies for future development of small scale pole and line fishery have been critically reviewed by James *et al.* (1987 b). Lack of boats and trained fishermen, steady supply of live-baits, navigtional aids, camping facilities, cold storages, fuel and fresh water supply are some of the main constraints. Silas and Pillai (1986) and James and Pillai (1987) suggested that introduction of 100 units (large pole and line vessels – OAL 15-20 m) would enhance the production of yellowfin and skipjack to the tune of 10,000 t by 2000 A.D. Each boat may require 500-800 kg of live-baits.

Introduction of purse seines has been suggested by Silas and Pillai (1986) and James and Pillai (1987). Large purse seiners (10-12 Nos) with annual production capacity of 6,000 t and 20 small purse seiners each with annual production capacity of 4,000 tonnes would lead to a production of 150,000 t of tunas. About 150 longliners with an annual production capacity of 450 tonnes would be required for obtaining a production of 60-75 thousand tonnes of tunas in the EEZ of India as a whole. The Lakshadweep by virtue of its strategic position could be used as a reconnoitering base and a springboard for greater expansion of our fishing range with future developmental programmes (Jones, 1986).

Live bait resources

Pole and line fishing essentially depends on adequate supplies of live-baits. Live baits for pole and line fishery have been described by Jones (1958), Silas and Pillai (1982). Biology of some of the live-bait fishes has been described by Mohan and Kunhikoya (1986). Exploited and potential resources of live bait fishes of Lakshadweep have been described by Pillai *et al.* 1986. Recent observations have indicated that there are resident and migrant forms.

The chief resident forms are *Chromis caeruleus, C. nigrurus, Spratelloides delicatulus, S. gracilis*, and representatives of caesionids. There are no pole and line fishing in Kadmat and Kalpeni though exploitable tuna live-bait resources belonging to sprats, apogonids, caesionids and pomacentrids are located. Initiation and expansion of pole and line fishery in these islands for utilising unexploited resources of live-baits are suitable proposition to the policy planners and administrators involved in the development of tuna fishing. Paucity of live-baits is the major constraint in Ammini and Kiltan. At Agatti, Bangaram, Tinnakara, Parli and Bitra over a dozen species were observed. At Kavaratti, about 30-45 kg of bait fishes were caught per day in March 1987 by 9 boats/units. At Suheli Par the quantity was higher (70-80 kg/day). Kalpeni has moderate abundance of bait fishes. In all these three islands, *S. delicatulus* was the most common species. At Minicoy *S. japonicus* and *Dipterygonotus leucogramicus* were also obtained. Except in Minicoy in all the islands *S. delicatulus* is the only bait species currently exploited. List of major species contributing the live-bait resources of Lakshadweep is given in Table 2.

Food fishes other than tunas

A variety of food fishes were found to occur in the lagoons and the sea in the vicinity of the islands. These are fished mostly in the lagoons and reefs using simple gear such as cast nets, dragnets, trapnets etc. The common food fishes observed were goatfishes, carangids, belonids and perches. Around Agatti, Bangaram, Tinakara, Bitra, Kavaratti, Kalpeni, Androth and Minicoy larger food fishes such as elasmobranchs, carangids, barracudas, serranids, lutianids, lethrinids, sailfishes and wahoo were observed. There is scope for exploiting these food fishes by longlining and trolling. Good quantities of sharks and rays are caught in Kavaratti, Suhelpar, Agatti, Bitra and Minicoy.

Ornamental fishes

A wide variety of colourful ornamental fishes inhabit the coral reefs of Lakshadweep and are suitable for maintenance of seawater aquaria. From Amini, Kadmat, Kiltan and Chetlat nearly 68 species were observed. The most common forms (30 species) belonged to the genera *Stethojulis, Halichoeres, Holocentrus, Chaetodon, Acanthurus, Chromis* and *Abudefduf*. From Agatti, Bangaram, Tinnakara and Bitra 87 species have been recorded. Some of the most beautiful ones and commonly encountered belonged to the families such as Labridae, Callyodontidae, Balistidae, Chaetodontidae, Acanthuridae, Pomacentridae, Serranidae, Muraenidae, Mullidae, Canthigasteridae, Lutianidae, Scorpionidae, and *Holicentridae*. There appears to be scope for exploiting the wide variety of ornamental fishes for export in a limited scale (James *et al.* 1987 a). It will be difficult at present to arrive at the stocks of these fishes; but information available so far indicated no decline in the stocks of these fishes. Collection, acclimatisation and transportation of live fishes for domestic and export market are receiving attention. Some trials of transport on board vessels and by air as well as their maintenance with or without coral associates need to be done. Trials have already been initiated at Minicoy in this direction in respect of species like *Chromis caeruleus, Dascyllus aruanus, Archamia fucata* and *Caesio caerulaureus*.

Coral and coral reefs

The status of coral reefs in Lakshadweep has been described by Pillai (1986). So far the studies have been centered around Minicoy. The northern part of Lakshadweep still remains to be least studied. The Lakshadweep has twelve atolls, three reefs and five submerged banks. During the recent survey 104 species of scleractinian corals have been collected. Among the non scleractinians, *Millepora, Heliopora* and *Tubipora* have been recorded. At least 25 species of scleractinian corals are new records to Lakshadweep.

Coral growth in Amini and Kadmat was found to be poor. The entire corals of the lagoon which was rich and varied almost died out during the last 12 to 13 years at Kiltan. At Chetlat and Agatti-Bitra group of islands, the lagoons showed intermittant thickets of corals belonging to the genera *Acropora, Heliopora, Porites, Pecillopora* and *Psammocora*. Corals at Kavaratti were quite healthy while in Androth poor growth was observed. Minicoy seemed to be the worst affected area due to human interference.

Echinoderm resources

A total of 81 species belonging to the phylum Echinodermata have been collected of which 16 species are new records from Lakshadweep. The fauna includes a number of economically important holothurians (sea cucumbers) used in the *Beche-de-mer* industry as well as many that are potential raw material for many bio active agents. *Actinopyga mauritiana* (Q & G), *A. echinites* (Jaeger), *A. miliaris* (Q & G), *Bohadschia argus* (Jaeger), *B. mormorata* (Jaeger), *Holothuria* (*Microthele*), *nobilies* (Selenka) and *Thelenota ananas* (Jagaer) are important species in *Beche-de-mer* preparation. Among these *H. (Microthele) nobilis* and *T. ananas* are highly priced items, and the former was found to be rich at Amini and to a lesser extent at Chetlat. The distribution and abundance of these species varied from island to island. The roe of the sea urchine *Tripneustes gratillia* (Linn.) is a delicacy in Japan. This species occured in fair numbers in Amini. A number of species of ornamental value observed were *Linckia laevigata, L. guildingi, Culcita novoguinea, Asteropsis carinifera* and *Dactylosaster cylindricus*.

Molluscan resources

In general, the reefs and lagoons of the islands harbour predominantly ornamental gastropods such as cowries *(Cyprea), Trochus, Turbo, Lambis, Murex,* and *Conus.* Bivalves were sparse in the lagoon/reef, mostly represented by giant clam, *Tridacna* spp. Good cowry fishing was observed at Kadmat, Chetlat, Agatti, Kalpitti, Bangaram and Tinnakaraq. The annual exploitation of cowries is estimated at 6-8 lakh nos. The peak fishing season for cowries is from September to November. The spat of pearl oysters *(Pinctada* spp.) was observed in dead coral boulders at Kiltan, Kadmat and Chetlat and Agatti – Bitra group of islands. Experimental pearl culture carried out at Bangaram showed good growth rate and low mortality though a predator gastropod *Cymatium* was observed. The octopus fished by the fishermen affords a sustenance fishery. Agatti, Kalpeni and Kavaratti are important centres for octopus fishing and the most common species was *Octopus vulgaris.* The Palk Bay squid *Sepioteuthis lessoniana* recorded from Kalpeni is of interest, as they have been recorded from the West Coast only from Vizhinjam and Veraval.

Crustacean resources

Crustacean resources of economic importance such as prawns and lobsters were meagre to support a fishery. Prawns such as *Penaeus japonicus* and *P. latisulcatus* and lobsters like *Panulirus versicolor* and *P. penicillatus* were recorded. But carideans, crabs and hermit crabs were plenty among coral boulders. The shore collections consisted of ocypod, portunid and xanthid crabs. At Minicoy fishermen have been found to collect lobsters in small quantities during October to January.

Seaweed and seagrass Resources

The marine algae have been systematically surveyed from a resource assessment angle (Anon, 1979), by the Central Salt and Marine Chemicals Research Institute. The biomass estimates (wet) of the standing crop for all Lakshadweep islands covering an area of 1,334 ha was estimated to be within 4,940 – 10,110 tonnes consisting of 980 – 2,100 tonnes of agarophytes, 10-16 tonnes alginophytes and 3,950 – 7980 tonnes of others. Major agarophytes observed were *Gelidiella acerosa, Gracilaria edulis, Gelidium rigidum* and *Gelidiopis repens.* Alginate resources were meagre, represented by *Turbinaria* and *Sargassum.* Sea weeds such as *Halimeda, Dictyota, Laurencia jania, Tolypiocladia, Caulerpa* and *Chondrococus* constituted more than 75% and are potentially useful sea weeds. Recent observations indicated that *Turbinaria* in harvestable quantities exist in all islands. Agarophytos such as *Hypnaea, Gelidiella, Gelidiopsis* etc. were observed to be abundant in Amini, Kadmat, Kultan and Chetlat. Harvestable quantity of *Gracilaria edulis* (20 tonnes) was observed in Agatti. Approximate standing crop of *Gelidiella acerosa* was estimated at 10 tonnes at Kavaratti and 3 tonnes at Kalpeni. The maximum estimated quantity of 50 tonnes comprising *Turbinaria* spp. was observed at Suheli Par and 20 t at Kavaratti. In most of the islands, seagrass beds were noticed. Dominant species were *Cymodocea serrulata, C. rotandata, Thalassia hemprichi, Syringodium isoetifolia, Halophila ovata* and *Halodule uninervis.*

Sponge fauna

Thomas (1973; 1979) mentioned 41 species of sponges from Minicoy including typical coral and shell boring species such as *Spirastrella cuspidifera, S. inconstance* and *Cliona* spp. The Indian bath sponge *Spongia officianalis* has been observed in Minicoy. Many sponges recorded from Minicoy are rich in bromine and iodine. Recent observations by CMFRI indicated that free living sponges are rare in Lakshadweep. But many boring forms which kills the coral colonies have been observed.

Marine mammals, sea turtles and sea birds

Dolphins *(Stenella longirostris)* are caught by harpoons and consumed locally. About 20 dolphins are caught annually at Androth. During the inter island travels the author has noticed dolphin shoals (James *et al.* 1987 a).

Bhaskar (1984) reported four species of sea turtles such as the hawksbill *(Erethmochelys imbricata),* the olive ridley *(Lepidochelys olivacea),* the green turtle *(Chelonia mydas)* and the leather-back *(Dermochelys coriacea).* Recent observations indicated that the green turtle and hawksbill turtle occur in good numbers in Agatti, Bangaram, Tinnakara and Bitra. At Suheli Par about 100 numbers of nests (old) of green turtle were observed.

The studies made by Betts (1938) revealed 44 species of birds. Recent studies indicated that the sooty tern *(Sterna* sp.) and Philippine noddy (*Anous stolidus pileatus*) are often seen on the sand banks close to the islands. Other species included the grey heron, burlew *(Namerius arquata)* and golden plover *(Pluvialis dominica).* Sootytern *Sterna sp.* and Philippine moddy *(A.s. pileatus)* are reported to lay eggs in the sand bank on the reef at Bitra. Terns are found in large numbers in Kodithala in between Cheriyam and Kalpeni islands.

Potential for mariculture

The sea in the Lakshadweep is usually calm for about 6 months. The lagoons of some of the islands such as Minicoy, Kavaratti and Kalpeni offer good scope for fin fish culture in cages, net enclosures and pens. In view of the pole and line expansion programme, bait fish culture could be tried. Artificial reefs also can be put up especially in Minicoy and tuna wastes could be used for attracting

fishes. The pearl culture programmes at Agatti and Bangaram could be improved with technical assistance from CMFRI. The shallow waters also offer scope for sea weed culture. Culture of holothurians through sea-ranching also can be attempted. Culture of ornamental fishes also is of prime importance.

Conservation

The atolls of Lakshwadweep with their comparatively small areas face special problems with regard to conservation, since they lack a large buffer zone (Anon 1981). It is essential to preserve the coral reef ecosystem of the island if the marine resources of this region are to be stabilised. The lagoon environment of Lakshadweep has undergone changes due to natural and artificial factors. Among the natural factors, mechanical force of cyclones, sea erosion, silting, predation and possibly natural senescence are important. Man made activities include construction and dredging operations, indiscriminate exploitation of certain resources, large scale quarrying and oil pollution. The atoll habitat is fragile, diverse and easily vulnerable and the effects of these adverse factors will have serious consequences. The lagoons of Minicoy, Kavaratti, Amini, Kadmat and Kiltan were subjected to long term dredging by the Lakshadweep Harbour Department. Such dredging is essential also for the development of the islands. At least in Minicoy and Kiltan it has destroyed extensive areas of corals by siltation. Since the intensity of coral growth is a major factor that determines settlement of coral reef fishes, their destruction affects the general fauna too. Adoption of a cautious approach to dredging and blasting of corals in the lagoon warrants immediate attention. Furture research programmes should attempt to 1) conduct experiments to rejuvenate, transplant and regrow the corals, and 2) sea-ranching with respect to commercially important groups. It is essential to declare undisturbed and undamaged areas like Suheli Par, Agatti, Bangaram, Kadmat and Chetlat as core areas for marine parks for the protection and preservation of the marine flora and fauna. Suitable underwater surveys should be undertaken. The local administration has initiated action to check sea erosion and also issued orders banning all sorts of collections of corals except for scientific purposes. Multimedia campaign to educate the public is also needed. The problem of conservation of the environment has to be effectively tackled to prevent any short or long term deleterious effects on the marine resources. There is ample scope for development for tourism. Sport fishing can attract tourists. Necessary steps to provide facilities like boats and gear for sport fishing may be taken up at suitable islands.

Comments

Though earlier research efforts carried out by CMFRI and National Institute of Oceanography have furthered our knowledge on the environmental characteristics, information on the seasonal changes taking place in Lakshadweep is not complete. The enviornmental features need integration with respect to resources in question. Such synoptic picture will help to understand the resources availability and their potential for future rational exploitation and conservation.

A sound data base is a pre-requisite for planning of research and development of marine fisheries. Continuous monitoring of resources and environmental parameters is necessary to critically review the progress of the on-going programmes, in identifying bottle necks and arriving at remedial measures. The CMFRI would be able to employ the latest techniques for exploration, research and management. For delineating productive areas of the sea, the Institute has developed expertise in remote sensing in collaboration with Indian Space Research Organisation. Keeping in view of the prosperity of the islanders, it is desirable to follow a systems approach where the various components are treated as essential parts of the system instead of dealing each problem in isolation. Such an appraoch would help in bringing to light the complexities of the problems in the correct perspective, in building up proper linkages between the different components and ensuring a fast and balanced growth of the economy of the islands.

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Table 1. Marine Fish Landings in Lakshadweep (1975 – 1985-86).

(Figures in tonnes)

Sl. No.	Species	1975	1976	1977	1978	1979	1980	1981-82	1982-83	1983-84	1984-85	1985-86
1.	Elasmobranchs	325	354	269	198	364	284	223	221	325	277	228
2.	Cat fishes	1	–	–	–	–	–	–	–	–	–	–
3.	Other sardines	–	–	–	–	–	–	–	–	–	–	–
4.	Belon & Hemirhamphus	29	33	58	144	101	99	103	84	95	65	39
5.	Flying fish	30	41	30	33	16	29	3	24	29	9	6
6.	Perches	186	193	211	163	203	376	253	245	257	149	143
7.	Red mullets	34	58	29	27	27	27	24	26	34	24	–
8.	Sciaenids	2	–	–	–	–	–	–	–	–	–	–
9.	Caranx	61	94	65	60	58	80	–	–	–	–	50
10.	Leiognathus	5	–	–	–	–	–	–	–	–	–	–
11.	See fish	66	87	41	41	24	21	58	97	63	52	58
12.	Tunnies	1932	1291	1116	1875	2794	1760	2930	2634	3042	4842	3775
13.	Sphyraena	17	20	15	18	11	14	9	10	21	13	–
14.	Cephalopods	19	40	23	20	15	13	15	20	13	13	11
15.	Miscellaneous	224	361	281	201	283	206	287	449	422	350	319
	Total	2931	2572	2215	2780	3486	2909	3907	3810	4301	5794	4629

Table 2. List of major species contributing the live-bait resources of Lakshadweep

Family	Species	Local name
Dussumieridae	*Spratelloides delicatulus*	Hondeli*; Manjachala+
	S. gracilis	Rehi*; Churaichala+
Apogonidae	*Archamia fucata*	Rybodi*; Poothan+
	Apogon sangiensis	Dombodi*; Poothan+
	A. leptacanthus	Dikkuribodi*; Poothan+
	Rhabdamia gracilis	Rehibodi*; Poothan+
	R. cypselurus	Digubodi*; Poothan+
	Ostorhynchus apogonides	Bondu*
	O. quadrifasciatus	*Rumkuribodi*; Poothan*+
Caesionidae	*Caesio caerulaureus*	Hudenmugurang*
	C. xanthonotus	Donkevumas*
	Gymnocaesio argenteus	Dandimugurang Chooraichala+
	G. gymnopterus	Geretha*
	Pterocaesio pisang	Rymugurang*
	P. tile	Rymugurang*
	P. chrysosona	Kekkurimugurang*
Pomacentridae	*Chromis caeruleus*	Nilamahi*; Pachakotai+
	C. nigrurus	Idugidari*
	Pomacentrus pavo	Huibui*
	Lepidozygus tapeinosoma	Bureki*; Majahibureki+
Atherinidae	*Pranesus pinguis*	Fitham*; Tholiyan+

* = at Minicoy; + = at northern islands

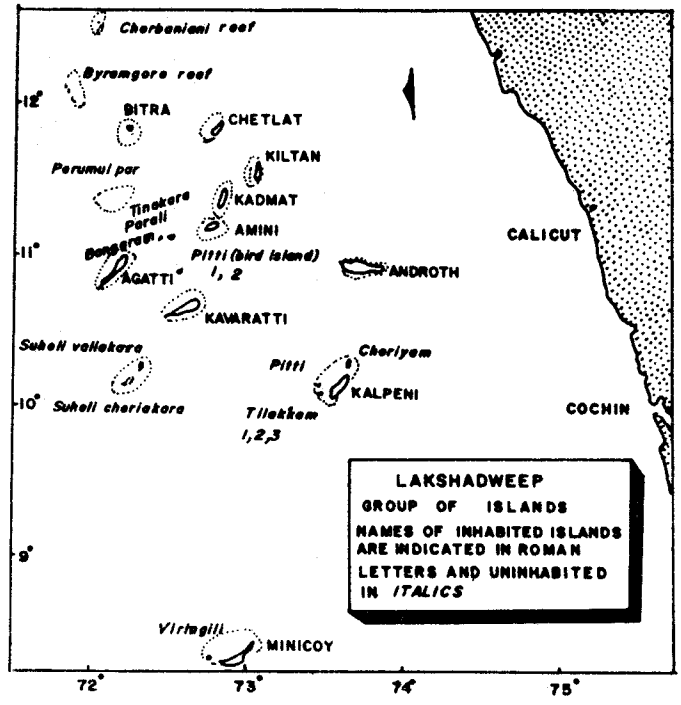

Fig. 1. The Lakshadweep group of islands.

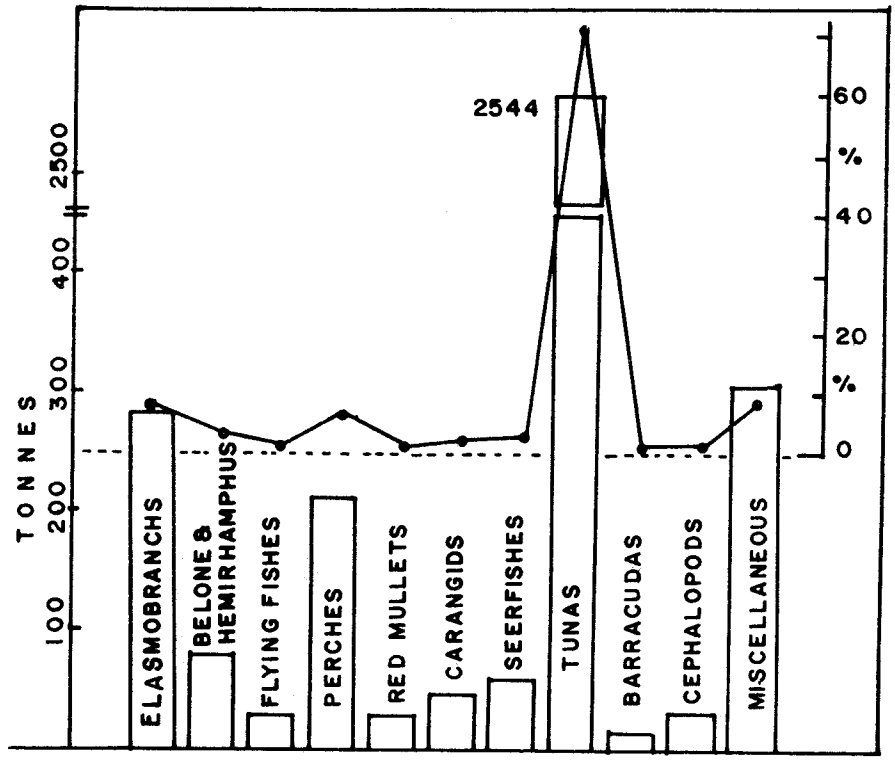

Fig. 2. Estimated landings (tonnes) of major groups of fishes and their percentage contribution (Av. 1975 to 1985-86)