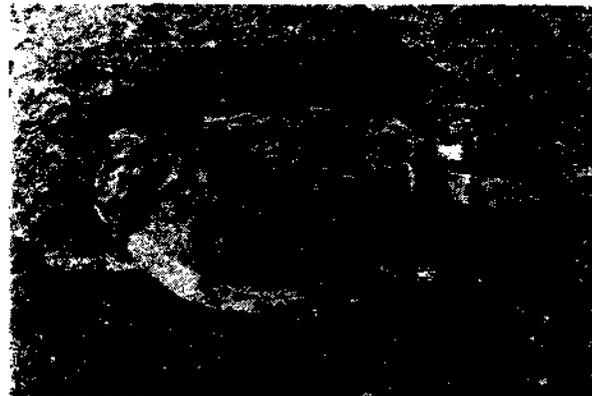


**CENTRAL MARINE FISHERIES  
RESEARCH INSTITUTE**

**Activities and Achievements**

**Madras Research Centre**



The Madras Research Centre of Central Marine Fisheries Research Institute (CMFRI) was originally established as Molluscan Research Unit in 1952. In fact, the history of this Centre dates back from 1947 when the Headquarters of CMFRI was first established in the Zoological Research Laboratories of the Madras University. In 1949 the Headquarters was shifted to Mandapam Camp, leaving behind a Fishery Survey Unit at Madras which was upgraded as a Research Unit in 1952. This Research Unit was further upgraded to a Substation in 1965 with the expansion of research activities and at present it is known as the Madras Research Centre of Central Marine Fisheries Research Institute. It is an active centre of research in marine fisheries of the Madras and adjacent areas which are well known for a variety of living resources of considerable economic importance.

#### **MAJOR ACTIVITIES AND ACHIEVEMENTS**

The work at this Research Centre includes several fields like estimation of marine fish production in northern Tamil Nadu and Southern Andhra Pradesh and research on fishery and biological characteristics of commercially important pelagic and demersal fishes, prawns, lobsters and molluscs, plankton and hydrography of coastal waters, biology and conservation of marine turtles, seed resources survey, mariculture of finfishes, prawns, lobsters, oysters and mussels, develop-

ment of hatchery techniques for production of the seeds of prawns, mussels and clams, and farm trials of compounded feeds for prawns. The major achievements of the Research Centre are the elucidation of the demersal fisheries of Madras Region and estimation of potential yield, studies on oilsardine which is caught in increasing quantities at present along the Coromandal coast, prediction of prawn fishery on short term basis, seed survey of finfish and prawns, hatchery production of the seed of penaeid prawns, operational research project on mussel culture, development of hatchery techniques for the green mussel *Perna viridis*, mussel culture in lagoon environment, production of the seed of the clam, *Meretrix casta* by hatchery method and survey of oyster and mussel resources along northern Tamil Nadu and Andhra coasts.

#### **Capture Fisheries**

Marine finfish and shellfish are exploited along Madras coast with a multitude of gears, comprising shore seines, boat seines, drift gill nets, hooks and lines and bottom trawls. Shoreseines, boat seines and hook and lines are operated with catamarans, drift gill nets with catamarans and mechanised vessels and shrimp and fish trawls using mechanised vessels. The annual marine fish production along Madras coast has been estimated to be 26,000 tonnes of which trawlers account for 85%.

### **Pelagic Fisheries**

The anchovies, lesser sardines, oil sardine, seer fish, mackerel, ribbon fish and tunas are the important pelagic fishes. The anchovy catches have shown a progressive increase in recent years and the estimated annual production is 130 t. Lesser sardines are fished in gill nets and their estimated annual production is 1,300 t. *Sardinella gibbosa* is the dominant species.

The emergence of oil sardine fishery along Tamil Nadu Coast in the past four years, especially off northern Tamil Nadu, is an interesting development. It is



*Oil sardine caught by Eda valai at Kasimedu, Madras*

caught by an encircling net, *Eda valai* and the annual production is over 2,000 t. Shoals appear in the coastal waters from January onwards and are caught upto June or September. The peak period of the fishery is variable. About 1,300 tonnes of ribbonfish are obtained along Madras coast and the catches are almost exclusively comprised of *Trichiurus lepturus*. 99% of the catches are obtained in fish trawls. The mackerel, *Rastrelliger kanagurta* is caught in limited quantities along the coast in trawls and bag nets and its spawning season reaches the peak during March-May. The seerfish comprising of two species *Scomberomorus commersoni* and *S. guttatus* are netted in drift gill nets and trawls and the annual production amounts to 200 tonnes.

### **Demersal fisheries**

The demersal fishery resources of Madras coast are being exploited by bottom trawling since the sixties and the catches consist of several groups like perches, silverbellies, scads, ribbonfishes, sciaenids, threadfin breams, lizardfishes, goatfishes, sharks and rays, prawns, crabs, sand lobster (*Thenus orientalis*), squids and cuttlefishes. The more dominant groups are silverbellies, threadfin breams, ribbon fishes, sciaenids, lizard fishes and *Decapterus* spp. During 1986-90 there has been a two-fold increase in the landings of Madras based trawlers to 22,000 tonnes as a consequence of trawling operations off Nellore Coast where there is greater abundance of demersal resources.

Studies on the stock assessment of the threadfin bream, *Nemipterus japonicus* have indicated that fishing effort may be further increased to raise the yield without adversely affecting the stock. The annual production of sciaenids amounts to 850 tonnes and includes thirteen species like *Kathala axillaris*, *Johnius carutta* and *Otolithus ruber*. In the case of *Johnius carutta* it is found that there is scope for increasing fishing effort to enhance yield, without affecting the stock.



*Fishes caught by trawlers,*

Experimental trawling conducted by CADALMIN III off Madras coast has indicated the occurrence of silver-



*The Research Vessel, CADALMIN III*

bellies, goatfishes, lizard fishes, sciaenids, penaeid prawns, squids, cuttlefish and prosobranch gastropods in coastal waters.

#### **Crustacean Fishery resources**

The prawn and crab catches by trawlers at Madras Fisheries Harbour are on the increase in recent years. The annual prawn production is 963 tonnes in 1989 and 1099 tonnes in 1990 compared to only 400 tonnes in 1985. The commercial catches include as many as 32 species of prawns among which *Metapenaeus dobsoni*,



*Cephalopods caught by trawlers off Madras*

*Penaeus indicus* and *P. maxillipedo* are the most abundant. *Metapenaeopsis stridulans*, *M. mogiensis* and *P. semisulcatus* are netted in substantial quantities. Operation of larger vessels has resulted in catches of more quantities of deep water prawns namely *Metapenaeopsis* and *Trachypenaeus*. The yearly crab landings of trawlers have been estimated as 400 t largely supported by *Portunus sanguinolentus*, *P. pelagicus* and *Charybdis* spp. About 20 tonnes of the sand lobster, *Thenus orientalis* are caught by trawlers annually. About 10 tonnes of Spiny lobsters are obtained in trammel nets at Kovalam.

#### **MOLLUSCAN FISHERY RESOURCES**

##### **Cephalopods**

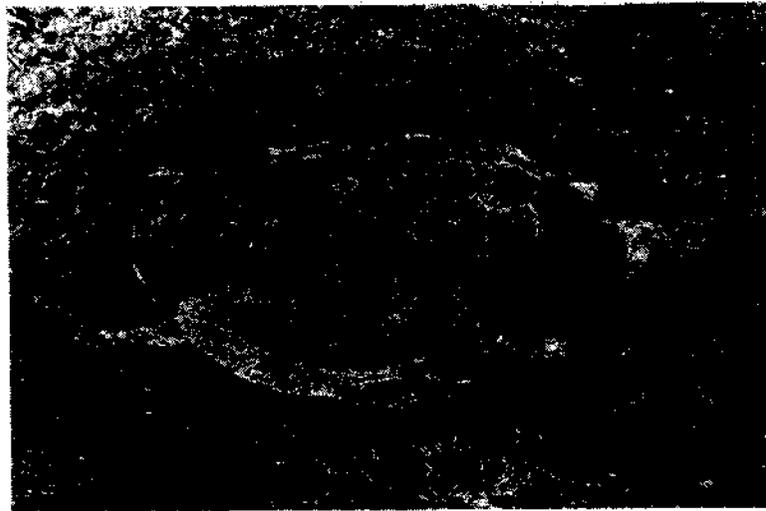
Cephalopods are obtained as incidental catch by trawlers and these amount to 600 t. The squid, *Loligo duvaucelii* and the cuttlefishes *Sepia pharaonis* and *S. aculeata* are the common species.

##### **Oysters and Mussels**

Survey of the edible oyster resources along northern Tamil Nadu and Andhra have indicated the presence of extensive beds in Pulicat Lake, Ennore Estuary, Thenpakkam, Chunnambar, Pennaiyar Estuary, Coleeroon Estuary, Kakinada, Gangapatnam, Krishnapatnam and Swarnamukhi Estuary. Mussel beds have been located in Ennore Estuary, Chunnambar, Pondicherry and Cuddalore.

### Fishery Environmental Studies

Plankton studies have indicated a peak in secondary production during July-September along Madras coast. In the northeast monsoon period (October-December), the standing crop is the lowest. The eggs and larvae of the fishes, *Thryssocles mystax*, *Stolephorus bataviensis*, *Caranx carangus* and *Caranx malabaricus* were reared and identified and the larvae of the mackerel, *Rastrelliger kanagurta* were collected from Madras coast. SST, salinity and dissolved oxygen have been monitored. An upwelling-like phenomenon occurs along the Madras coast during July-September. Drift bottles released along Madras coast were recovered from Madagascar coast indicating drifting southwards to Sri Lanka coast, then westwards and northwestwards to Madagascar.



*The Olive Ridley, Lepidochelys olivacea*

### Marine Turtles

Investigations have been carried out on the conservation, management and biology of marine turtles. A Recovery Programme for the Olive Ridley, *Lepidochelys olivacea* was conducted and over 510,000 hatchlings from CMFRI Field Laboratory at Kovalam have been released in the sea. Arribada, the mass nesting of turtles at Garhimatha Beach, Orissa, has been investigated in detail during 1983-89. The chemical and energy conversion of yolk in Olive Ridley eggs and hatchlings, food intake, food preference, absorption and conversion efficiency in hatchlings, growth and effect of starvation have been studied.

### Mariculture Activities

During 1978-89 experiments were carried out on the culture of finfishes and shellfishes, making use of the Fish Farm at Muthukadu. Polyculture of the Milkfish with the mullets *Mugil cephalus*, *Liza macrolepis* and *L. cunnesius* was carried out in ponds. The seeds of *Penaeus japonicus*, *P. latisulcatus* and *P. canaliculatus* were produced by hatchery techniques for the first time in India in the Field Laboratory at Kovalam and cultured in Muttukadu Farm. Breeding and rearing of the commercially important Spiny lobster, *Panulirus homarus* was carried out; and its fecundity, spawning, eggs and



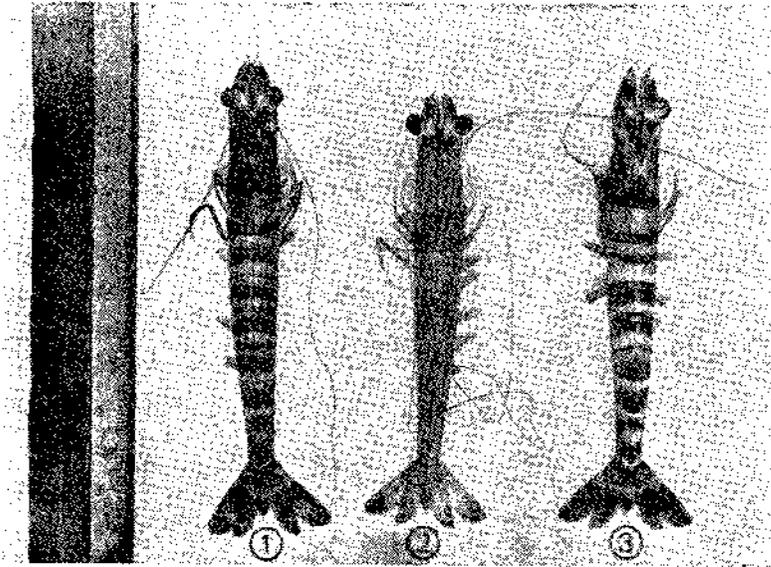
*Cultured Milkfish, Chanos chanos harvested from Muttukadu Fish Farm.*

larval development were studied. Bilateral ablation of eye stalks has resulted in acceleration of growth and increase in weight by three to seven times in *P. homarus*, *P. polyphagus*, *P. ornatus* and *P. versicolor*. Unilateral ablation of eyestalks has resulted in gonadal maturation of *P. homarus*.



*Cultured Mulletts and Chanos harvested from polyculture in Muttukadu Fish Farm*

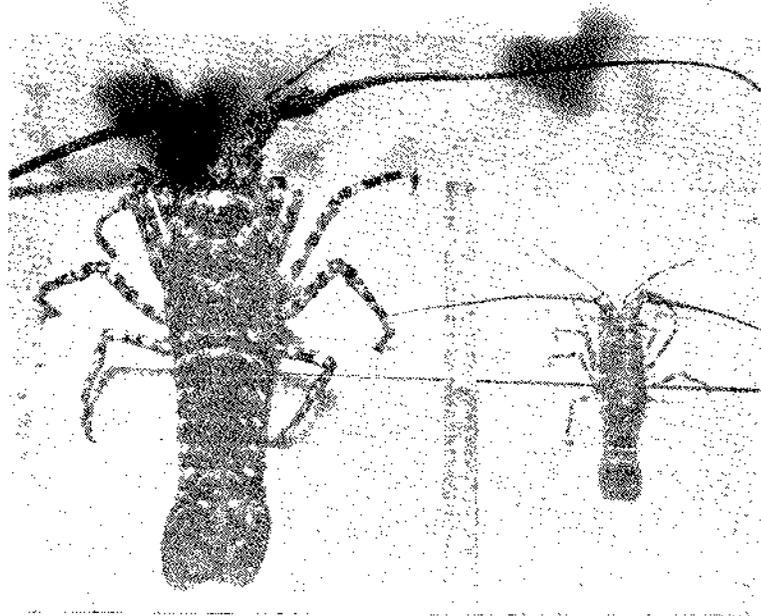
Experimental work in Muttukadu Lagoon and Pulicat Lake has shown that major oyster spat-fall takes place during March-June and a minor one dur-



The penaeid prawns: 1. *Penaeus japonicus*, 2. *P. latissulcatus*  
3. *P. canaliculatus* produced by hatchery techniques.

ing September - October. Oyster culture was experimented by rack culture method at Muttukadu and by bottom culture method at Pulicat. The green mussel *Perna viridis* was cultured in the Muttukadu Lagoon by Pole Method and Rack Method. High production rate was obtained in the two culture systems indicating that with proper management, the lagoon can be profitably utilized. *Perna viridis* were conditioned for maturation by feeding with a rich supply of diatoms and spawning

was induced by thermal or mechanical stimulation. The eggs and larvae were reared in the hatchery and a large quantity of mussel seed were produced. For the first time, seed of the economically important clam *Meretrix casta* have been produced by induced maturation, spawning and larval rearing in Kovalam laboratory and the seed were used for stocking Muttukadu Lagoon.



Eyestalk ablation induced growth increase in the Spiny lobster, *Panulirus ornatus*



*Harvested green mussel from culture operations.*

#### **Farm trial of compounded feeds developed for prawns**

Compounded feeds formulated for semi-intensive culture of the prawns, *Penaeus monodon* and *P. indicus* are being produced and tested at selected feed manufacturing units and prawn farms at Nellore. In addition, monitoring of feeding practices in prawn farms in Nellore District is being carried out to evolve proper feeding strategies. Physico-chemical characteristics of water and soil in prawn culture ponds and water management are also being studied to evolve a comprehensive design for optimising prawn production in culture systems.

#### **Operational Research Project**

For demonstrating the possibilities of supplementing traditional fishing with culture of marine organisms, an Operational Research Project, "Blending sea farming with traditional capture fisheries" was conducted and a hundred fisherfolk of a fishing village near Madras were involved in mussel culture. The fisherfolk were also trained in the preparation of recipes with mussel meat.

#### **Lab to Land programme**

The technology developed by CMFRI in mussel farming has been transferred to the fishermen of Kovalam, Muttukadu and Karikattukuppam of Chingleput District.

#### **Staff strength and Infrastructure facilities**

The Research Centre has 16 Scientists, 5 Technical Officers, 24 Technical, 9 Ministerial, 5 Auxilliary and 20 Supporting staff. The Research Centre has well equipped laboratories, museum, library, two jeeps and a 13.3 m (43.5') Research Vessel CADALMIN III. Six Field Centres located at Ongole, Nellore, Kovalam, Mahabalipuram, Pondicherry and Cuddalore with one Technical Officer and ten Technical Assistants who collect marine fishery data are attached to the Madras Research Centre.

### **Future programmes**

Research programmes in marine capture fisheries will concentrate on population dynamics and stock assessment of commercially important pelagic and demersal fishes and shellfishes which will be helpful in planning proper management and exploitation of the resources. Exploratory fishing in the Exclusive Economic

Zone and studies on the relationship between the fisheries and environmental parameters will be given special emphasis. Active efforts will be made for the evaluation of compounded feeds for semi-intensive and extensive prawn culture, evolving appropriate feeding strategies in prawn farming and identification of suitable areas for the culture of molluscs.



---

Published by Dr PSBR James, Director, Central Marine Fisheries Research Institute (Indian Council of Agricultural Research) Cochin-682 031.

Editing & Production: Mrs. Jancy Gupta, Scientist; Technical Assistance : Mr. A. Kanakkan.

Printed at: Anaswara Printing & Publishing Co., SRM Road, Cochin-18.