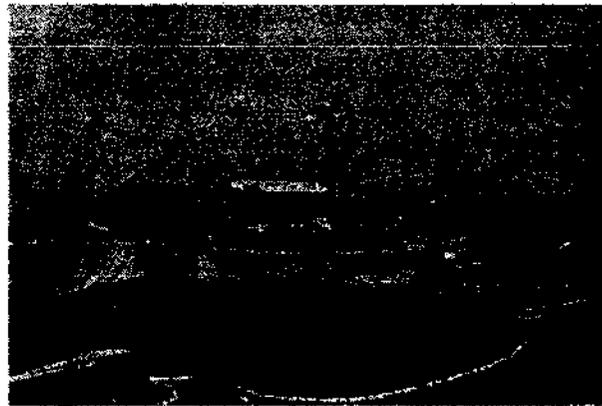


**CENTRAL MARINE FISHERIES  
RESEARCH INSTITUTE**

**Activities and Achievements**

**Mangalore Research Centre**



A unit of Central Marine Fisheries Research Institute was established at Mangalore in 1957. With the addition of more personnel and increase in research activities, this was raised to the status of a full-fledged Sub-station in 1969. Subsequently in 1976, this establishment has been renamed as Mangalore Research Centre of Central Marine Fisheries Research Institute.

### MAJOR ACTIVITIES AND ACHIEVEMENTS

The major research programmes at this Centre are on capture fisheries and are concerned with monitoring and evaluation of the marine fisheries and resources characteristics of important coastal pelagic groups like tunas, mackerel, oilsardine, lesser sardines, anchovies, pomfrets, seer fishes and carangids; demersal groups like cat fishes, threadfin breams, lizard fishes and ribbon fishes; crustaceans like penaeid prawns, crabs and stomatopods, and molluscs like cephalopods and clams. Besides, investigations on the environmental characteristics and secondary production of the area in relation to fisheries are being carried out. Past work has included experimental trawling, tagging of oilsardine and mackerel, experimental culture of fin fish and shell fish and seed resources survey. Also, stock assessment studies were conducted on the commercially important resources like oilsardine, mackerel, tunas, anchovies, squids and cuttle fishes, prawns, crabs, and stomatopods. Studies on the biology, fishery and resources characteristics of the commercially important species of fish and shell fish have been undertaken. The recent deve-

lopment of Mangalore (Bunder) and Malpe as major fisheries harbours with infrastructure facilities for the exploitation of the pelagic and demersal resources have made this area important.

### Pelagic fishery resources

The pelagic fisheries which were exploited by indigenous gears like 'rampani', 'chalabale', 'pattabale' 'kanthabale' and cast nets till early seventies have undergone a revolution due to the introduction of purse seines in large numbers. Detailed studies on the biology, fishery and resources characteristics including age and growth,



*Mackerel — a major resource at Mangalore*



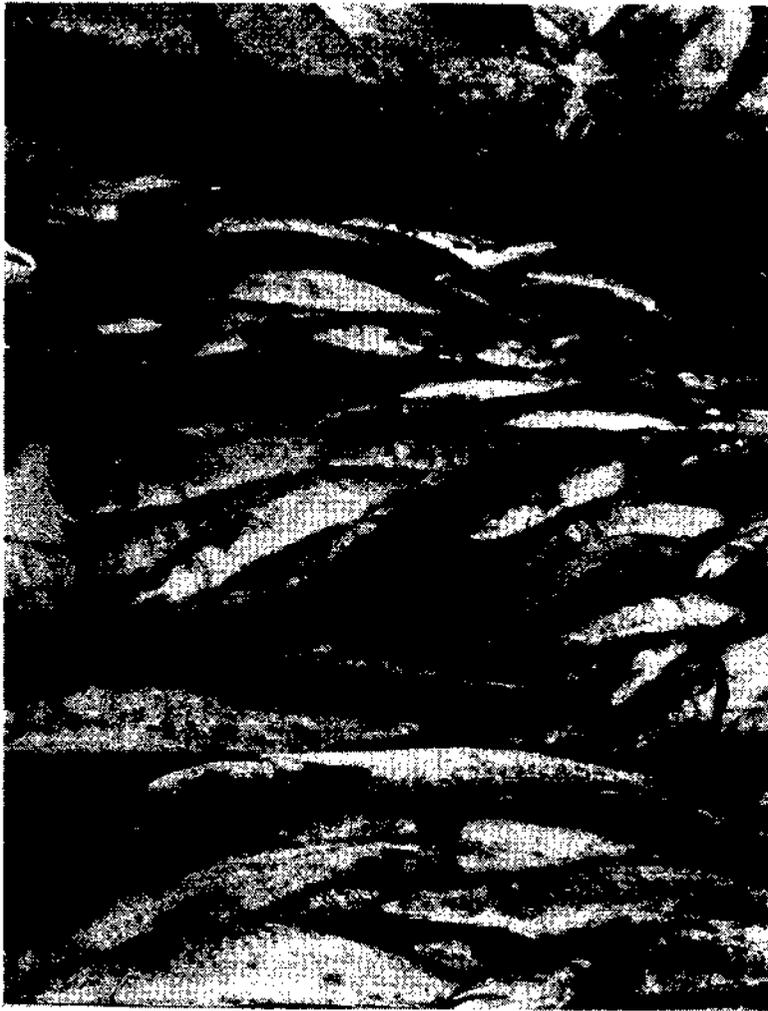
*Oil sardine — a dominant fishery along Mangalore coast*

food and feeding, maturation and spawning, sex ratio, fecundity, migration and mortality of mackerel, oilsardine, anchovies and tunas are being undertaken to evaluate the impact of exploitation on the resources. Studies on the maturation behaviour of 3 species of tunas have indicated that these species approach the coastal waters for spawning during September-December. The fishery of *Euthynnus affinis* has been supported by 0.4, *Auxis thazard* 0-1 and *Thunnus tonggol* 0-3 year classes. Stock assessment studies have suggested that a substantial increase in production is possible by increasing the fishing pressure since the exploitation rates are low and the stocks are underexploited.

Studies on mackerel resources have indicated that recruitment of 0-year class to the fishery takes place during Sept-Dec, when the fish is about 8 months old. Population parameters like asymptotic length ( $L_c$ ), growth coefficient ( $K$ ) and total mortality coefficient ( $Z$ ) have been estimated. The exploitation rate is found to be low (0.65). Investigations on the oilsardine resources have revealed that spawning appears to be protracted (June-Sept.). The species attains a length of 140-149 mm and 170-179 mm on completion of 1st and 2nd years of its life. The fishery is mainly supported by 0 year and 1 year classes. The instantaneous rate of mortality ( $Z$ ) is found to be 2.3 which is



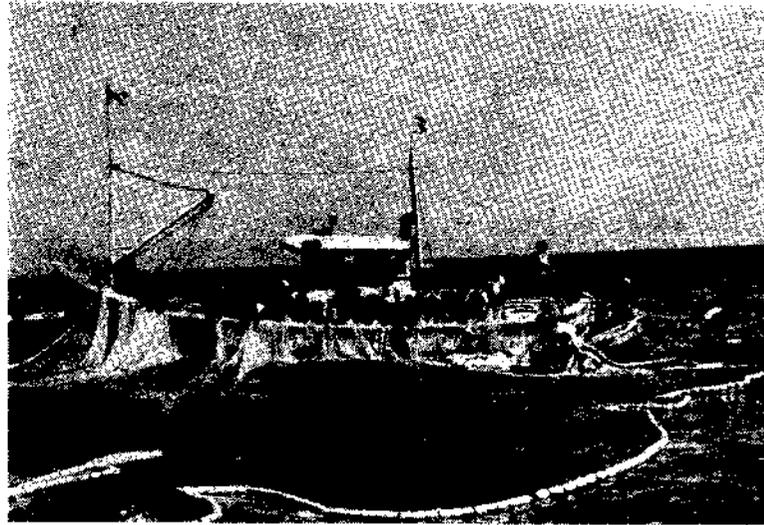
*White bait landings by purse seine at Malpe*



*Seer fishes caught by drift nets at Malpe*

much higher than that of the traditional fishery ( $Z=1.2$  to  $1.6$ ), indicating higher rate of exploitation by the purse seine fishery.

Studies on the resources of anchovies have indicated that maximum aggregations of the white bait off Mangalore have occurred during October-February and April-May. The fishery is supported by 0 year and 1 year old fish and the breeding period extends over several months with peaks during April-May and Nov-February. Investigations on Seer fish resources have indicated that the annual mortality rate for King seer (*Scomberomorus com-*



*Purse seine operation at Mangalore*

*mersoni*) and Spotted seer (*S. guttatus*) are 0.6 and 0.7 respectively. This has suggested that seer fishes are under-exploited and an expansion in the fishery would result in an increased production, without affecting these stocks.

#### Demersal fishery resources

Forming around 25% of the marine fish catch, demersal fishery resources have mainly consisted of threadfin breams (10.8%), flatfishes (11.8%), lizard fishes (5.2%), cat fishes (4.1%), sciaenids (2.4%), cephalopods (2.2%), prawns (15.8%), crabs (1.8%) and stomatopods (23.3%). They are mainly exploited by small mechanised trawlers. With the



*Cat fishes*

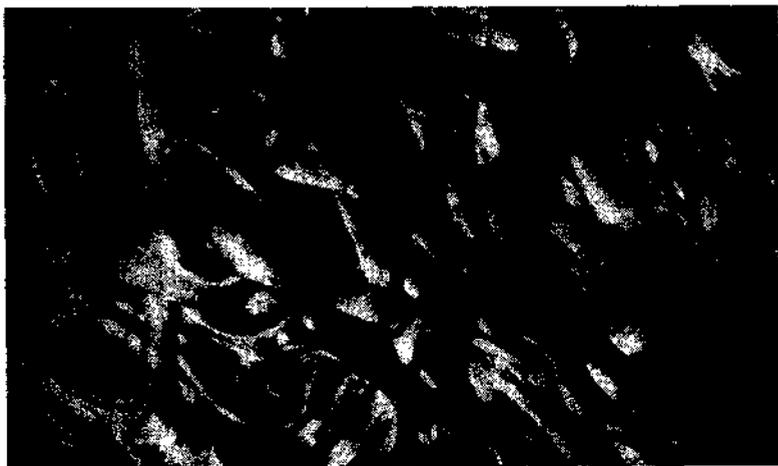


*Threadfin breams*

introduction of medium sized trawlers (above 9.75 m) in large numbers since 1982-83 in the mid shelf area the demersal resources of the region are being well exploited.

Studies on the seasonal abundance of the fishery and the resources characteristics of cat fishes have indicated that the fishery is mainly supported by *Tachysurus tenuispinis* and *T. dussumieri*. The former spawns in September and the latter during January-February. Segregation of sexes has been noticed during spawning and incubation period. Shoals, exclusively of females, abound the inshore

waters during spawning (Sept-Oct., in the case of *T. tenuispinis* and Feb-March for *T. dussumieri*) and incubating males later. The inshore waters appear to be suitable nursery grounds where incubating males aggregate. This behaviour leads to destruction of millions of developing eggs of *T. tenuispinis* during September-October and postlarval young ones of *T. dussumieri* during February-March by purse seines. Again, shrimp trawlers exploit the juveniles from the inshore waters during April-May. This indiscriminate destruction has an adverse effect on the stocks. The maximum annual stock of *T. tenuispinis* at Mangalore is estimated to be 1482 tonnes and presently the maximum catch is 1008 tonnes.



*Ribbon fishes*



*Deep sea sharks at Malpe*

#### **Crustacean fishery resources**

Crustaceans like prawns, crabs and stomatopods which are commercially very important, particularly prawns, are exploited by small shrimp trawlers and medium trawlers during most part of the year. Biology, fishery and resource characteristics of important species of penaeid prawns, crabs and squilla are studied in detail for stock assessment. Stock assessment studies have indicated that the fishing pressure exerted at present on the stocks of prawns is just at the level where sustainable

yield could be obtained without adversely affecting the stocks. The mean size of *Metapenaeus dobsoni* and *Parapenaeopsis stylifera* from the landings have also indicated that there is no downward trend in recent years, thus supporting the above conclusion.



*Prawns — important foreign exchange earners*

Studies on the inshore crab *Portunus sanguinolentus* have indicated that growth is uniform in both sexes; spawning taking place throughout the year and sex ratio is nearly equal. Studies on fecundity have revealed that there is a positive relationship between fecundity and size.

#### **Molluscan fishery resources**

The fishery and resources of cephalopods in the inshore waters of Mangalore area have been closely monitored. The fishery and biology along with resource characteristics of the predominant species of squids and cuttle fishes are being investigated as these resources have assumed great significance in the export market in recent years. Survey of clams and oyster resources of the South Kanara coast showed that out of an estimated standing stock of 6700 tonnes of clams and oysters in the estuaries between Mangalore and Honnavar, 80% are clams and 20% are oysters. The resource potential of the predominant clam, *Meretrix casta* and the oyster *Crassostrea madrasensis* is

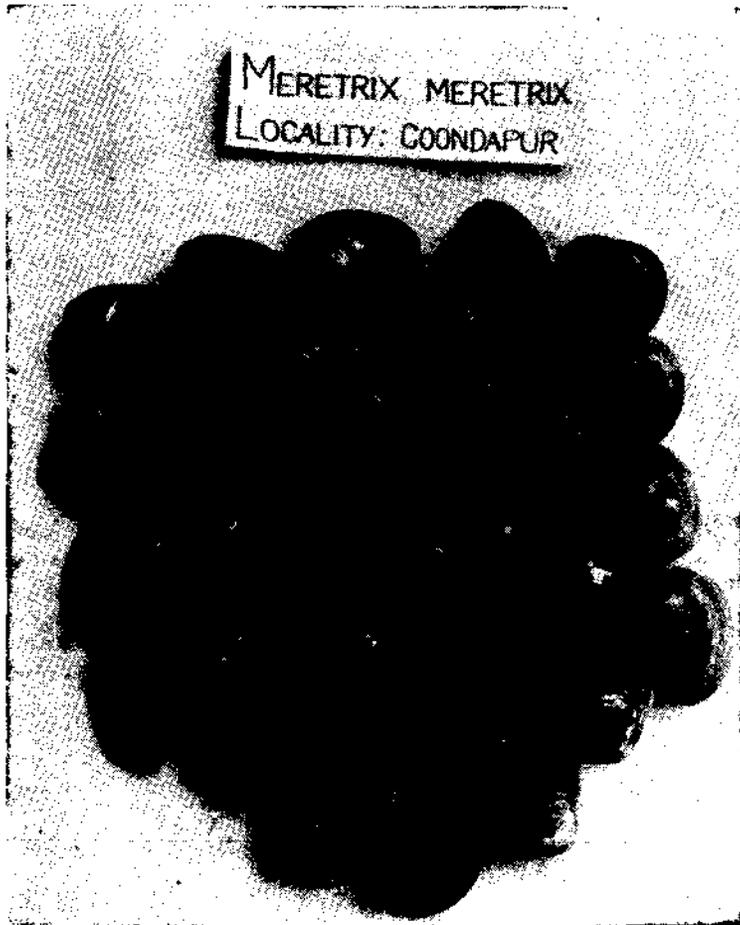


*Cephalopods*

indicated. Among the estuaries surveyed, Mulky estuary is more productive with a production rate of 18 t/ha.

#### Environmental studies

Fishery environmental data, viz., temperature, pH, salinity, dissolved oxygen, organic silicates and phosphates and data on secondary production have been collected from inshore and studied for their influence on fisheries of the inshore area. These studies have revealed that tem-



*Clams at Coondapur*



*Museum*

perature, salinity and oxygen have a bimodal pattern of distribution. Primary peaks of silicates and phosphates occur in August coinciding with the South-West monsoon. October to December is the period of maximum production of zooplankton coinciding with peak fishing season. During this period salinity is low and dissolved oxygen values are quite high.

#### **STAFF STRENGTH AND INFRASTRUCTURE FACILITIES**

There are 6 scientists, 15 technical staff, 4 administrative staff and 9 supporting staff at this Centre. The Centre has well equipped laboratory and field equipments necessary to carry out research programmes under various disciplines. It is also provided with a 24' pablo boat for making collections from the estuarine and inshore marine environments and a jeep for regular field trips. The Centre has a library containing 412 books, 1392 journals, bulletins, proceedings, special publications, abstracts, periodicals etc. dealing with taxonomy, fishery biology, fishing, fish culture, fishery statistics, marine biology and oceanography.

#### **Future Programmes**

While monitoring of the resource oriented projects on capture fisheries will continue with greater emphasis on stock assessment of major resources, the following new areas will be taken up for future investigations.

- 1) The impact of purse seining on the artisanal fishery and its socio-economic implications on the artisanal fishermen.
- 2) Large-scale tagging of commercially important fin fish and shell fish to obtain direct evidence on migration, growth and stock dynamics.
- 3) Detailed investigations on the "matabale" operations and its impact on the breeding stocks of prawns and juveniles of commercially important fish groups.
- 4) In depth studies on the fishery environment and its influence on the seasonal fluctuations of coastal fisheries.



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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 : Mrs. K. P. Salini

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