



# CMFRI NEWSLETTER

January-June -1999, No. 85 and 86

## Dr.V.N. Pillai takes over as Director



Dr.V.N.Pillai took over as Director of Central Marine Fisheries Research Institute, Cochin on 14 May. Dr. Pillai, Goldmedalist from Kerala University for his postgraduation in Oceanography in the year 1961, was awarded Ph.D. in Fisheries Oceanography in the year 1982 by the Cochin University of Science and Technology. He served the R & D organisations of the Ministry of Defence, National Institute of Oceanography under CSIR, the Central Institute of Fisheries Nautical and Engineering Training, and the Integrated Fisheries Project under the Ministry of Agriculture, Government of India in various capacities before he was inducted, into the Agricultural Research Service under the Indian Council of Agricultural Research in the year 1985. His contributions to the Fishery

Oceanography of the Southeastern Arabian Sea during his deputation to the erstwhile FAO/UNDP Pelagic Fishery Project are highly commendable. He had undergone training in fisheries oceanography in the MAFF Fisheries Laboratory, Lowestoft, England. His contributions on the application of remote sensing data in marine fisheries undertaken through collaborative programmes, with the National Remote Sensing Agency, Hyderabad and Space Application Centre, Ahmedabad were well appreciated. Dr. Pillai coordinated the scientific programmes of the largest Fisheries Oceanographic Research Vessel SAGAR SAMPADA owned by the Department of Ocean Development, Government of India during the period 1985-'90. He served the CMFRI in various capacities since 1985 and was elevated to the position of Officer-in-Charge, Calicut Research Centre of CMFRI in 1990 and Head of the Fishery Environment Management Division

of the Institute in 1996. His vast experience through participation on research cruises undertaken by various Indian and foreign research vessels has made him one among the top fishery oceanographers in the country.

With a total of more than 70 publications to his credit both in International and National journals of repute, Dr. Pillai is a consultant in the disciplines of ecology and ecosystem management of the collaborative ICLARM project on "Sustainable management of coastal fish stocks in Asia" with funding from Asian Development Bank and representation from 8 member countries including India. Dr. Pillai had travelled widely around the globe.

His post doctoral research contributions since 1982 in the field of fisheries oceanography have been compiled and submitted to the Cochin University of Science & Technology for the award of D.Sc. in Fisheries Oceanography.

## Dr. M. Devaraj, Director retires from service



Dr. M. Devaraj, Director, Central Marine Fisheries Research Institute, Cochin retired from service on 31 March 1999 on attaining the age of superannuation. He has served in various capacities in several institutions including Tamil Nadu State Fisheries Department, the CMFRI, Fisheries College and Research Institution of Tamil Nadu Agricultural University and the CIFE. He is an international expert in fish population dynamics and his book on 'Fish Population Dynamics' has

been acclaimed internationally as one of the most leading books in the subject. His contributions to marine fisheries management formed the basis for conflict resolutions in marine fisheries of various maritime states. He has served as member/ chairman in various committees at National and International level. Internationally he served as a member of the UNESCO Expert panel, reviewed the work progress of the Demersal Fisheries Division of the Marine Sciences of Fisheries Centre of the Ministry of Agriculture and Fisheries of the Sultanate of Oman, Muscat.

As Director, CMFRI, he evolved new strategies to extend the benefits

of research results to the industry and the fishermen community. Many pilot projects have been initiated on mariculture and a number of funded projects worth over Rs 4 crores got approved during 1996 - '98 and being implemented.

Through extensive tours covering 11 countries (England, Senegal, Pakistan, Singapore, Egypt, Iran, Malaysia, Muscat, Thailand, Maldives and Sri Lanka) he gained substantial international experience in various research and development activities.

Published over 80 scientific papers on fishery biology, fisheries modelling, production economics and management.

## RESEARCH HIGHLIGHTS

### Successful breeding of damsel fish

Brood stock of the damsel fish (*Pomacentrus arenarius*) maintained in the tank of the Calicut Research Centre spawned and the number of eggs ranged from 2000

to 3000. The larvae were fed with *Isochrysis* and *Tetraselmis* and a good survival rate was observed. Rearing is in progress.

### Seed production of abalone *Haliotis varia*

Mature abalones collected from the wild were induced to spawn. Fertilised eggs were round with a diameter of 150-180 microns. First larvae hatched out after 12-16 hours

of fertilisation. After 2 months the juveniles grown to a size of 3.5-4.0 mm length with 3-4 pores. They attained a size of 0.9-1.2 cm in five months. Work is continuing.

### Tissue culture experiments

With a view to test the extraneous source of nourishment for pearl sac cells, tissue culture experiments using tissues from the hepatopancreas (an important source of lipids) was attempted in pearl oyster, abalone, edible oyster and gastropods. The cells from the oyster mantle secreted crystal like substances. Dense mass of cells were liberated from the gonad cells and multiplied profusely. Newly formed cells were round and larger in size compared to the mantle and hepatopancreatic cells. Further studies are under progress.

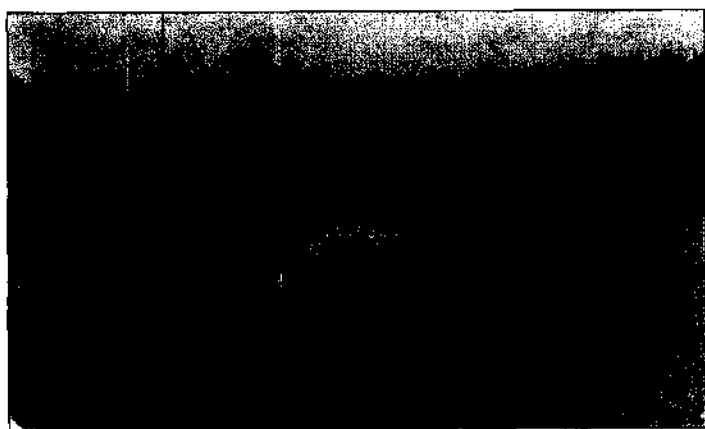
## Shrimp culture experiments at Mandapam

Experimental shrimp culture was conducted in seven earthen ponds, sizes ranging from 0.08 to 0.38 ha, at the Mandapam Regional Centre. Candidate species grown were *Penaeus semisulcatus* and *P. monodon*. Seeds produced in the backyard hatchery of the centre were used. Out of 7 ponds, two ponds (0.5 ha) were stocked with 42,500 PL-29 of *P. semisulcatus* and 5 ponds

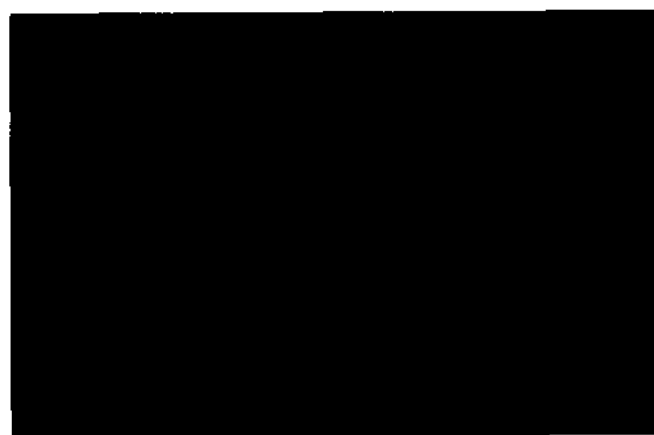
(1.1 ha) with 1,12,500 PL 15 of *P. monodon*. Stocked population were fed with shrimp feed. Survival for *P. semisulcatus* ranged from 58.4 to 67.71% and for *P. monodon* it varied between 79.04 and 96.57%. The harvested size of *P. semisulcatus* varied between 13.7 and 17.5g, while that of *P. monodon* ranged from 25.4 to 37.0 g in all the 5 ponds. The total profit out of the sale

of shrimp was Rs.4,50,479/-

Seeds of *P. monodon* from two breeders were produced separately and reared under similar conditions, out of which one showed faster growth (37 g). Male and female of the fast grown *P. monodon* were selected for brood stock development in captivity.



Experimental Ponds of Shrimp, Regional Centre of CMFRI, Mandapam Camp



Harvested Green Tiger Shrimp *P. semisulcatus*

## EXTENSION HIGHLIGHTS

### Harvest of farmed crabs at Panampukad

With the financial support of Rs. 2 lakh from the District Administration, twenty farmers at Panampukad village

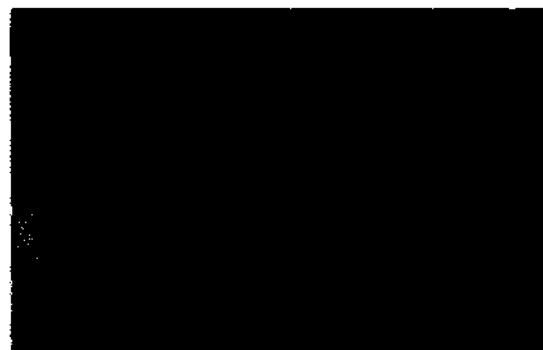
were motivated to adopt crab culture. Pond size of the farmers varied between 15-20 cents.



Shri. V P Joy, IAS, inaugurating the Crab Harvest at Panampukad.

Crab seeds of 100-150g collected from a private entrepreneur were stocked at the rate of 400 numbers in each pond. Crabs were fed

with trash fishes. Culture activities undertaken were regularly monitored by the CMFRI Scientists. After a culture period of six months the farmers harvested on an average 100-150 Kg of crabs depending on the size of the respective pond.



Model Crab Farm

A harvest festival was organised at the village under the auspices of the Ernakulam District Collector Shri. V.P. Joy, I.A.S.

## Exhibitions

Participated in the science exhibition conducted by the Adarsh Vidyalaya Higher Secondary School in Paravoor between 11-14 January '99.

Participated in the Cochin Expo-98 organised by the Consumer Welfare Association at Kaloor, Cochin, from 20 December '98 to 31 January '99.



*CMFRI Stall at the COCHIN EXPO Exhibition*

## Pearl Sale Mela

A Pearl Sale Mela was organised at CMFRI on 11 May which was inaugurated by Shri. Jose Cyriac, I.A.S, Chairman, MPEDA and presided over by Dr. M. Devaraj, Director, CMFRI. Pearls produced from the Mandapam Regional Centre under the ICAR revolving fund project were exhibited for sales.



*CMFRI Stall at the Science Exhibition at Paravur.*



*Inauguration of Pearl Sale Mela by Shri. Jose Cyriac, IAS seen by Shri. K. R. Vishwambharan, District Collector, Ernakulam*

## Fishermen - Farmers - Industry - Institution - Meet

The XXXII Fishermen - Farmers - Industry - Institution - meet was conducted on 28 May at Udayamperoor with the focal theme on ornamental fish culture. More than fifty fishermen attended.

## Demonstration of open sea mussel farming

Open sea mussel culture was carried out in the sea off Narakkal, Cochin by involving four local fishermen. A quantity of 500 Kg of mussel harvested were sold @ Rs. 70/Kg.

Demonstration on mussel farming was organised at Dalavapuram in Ashtamudi lake near Quilon on 18 June.

## Installation of artificial reef

The Vizhinjam Research Centre of CMFRI with the financial back up of Rs 3

lakh from the Kerala State Fisheries Department and with the active participation of fishermen community installed 135 numbers of ferrocement modules of artificial reef off Poovar near Vizhinjam.

## Book Release

The official release of book on 'Consultancy Services in Marine Fisheries' was held on 30 June at CMFRI, Cochin. Shri. Babu Rajan, IAS, Chairman, Cochin Port Trust delivered the inaugural address and the book was released by Shri. Manik Phan, Deputy Director, IFP, Cochin.



*Shri. Babu Rajan, IAS, Chairman, Cochin Port Trust receiving the Book on 'Consultancy Services in Marine Fisheries' from Shri. Manik Phan, Deputy Director IFP, Cochin*

## **Sagar Sampada Cruise Programme**

FORV Sagar Sampada during her Cruise No. 173 undertook voyage along the south coast of India for a period of 25 days from 31 May with the objective of assessment of environmental parameters of marine

living resources in the Indian EEZ and the role of myctophid fauna in the mesopelagic habitat. The cruise also aimed at the study of Deep Scattering Layer (DSL) and toxic algal blooms of the EEZ of India.

### **Staff Research Council Meeting**

The VIth reconstituted Staff Research Council Meeting of the Institute was held during 21-25 June at CMFRI Headquarters. The progress made in the research projects was reviewed in the meeting. Dr. A. Selvakumar, ADG (Marine Fisheries), ICAR New Delhi was also present on the occasion.

### **Summer School**

A Summer School on 'Recent Approaches to Marine Fisheries Resources Assessment and Management', sponsored by the Indian Council of Agricultural Research, New Delhi was conducted for one month from 24 May to 22 June. Twenty three participants represented by Assistant Professors, Lecturers and Research Scholars of various Universities attended.

Certificates were distributed to the participants by Dr. A. Selvakumar,

### **Research Advisory Committee Meeting**

The Research Advisory Committee Meeting of the Institute was held at Calicut Research Centre of CMFRI on 21 January with Prof. Balakrishnan Nair, as the chairman. The committee reviewed the ongoing research projects of the Institute.

### **Funded Project**

A Project on 'Large scale cultivation of *Gracilaria edulis*' by reproductive method was approved under the ICAR adhoc scheme for an amount of Rs. 17,59,520 and the project works are started.



*Distribution of Certificates to the participants of Summer School by Dr. A. Selvakumar, (ADG) during the valedictory function.*

(ADG), at the valedictory function held on 22 June.

## **Hindi Activities / Programme**

Shri. Nand Kishore, Senior Administrative Officer inspected the Official Language implementation activities of Bombay Research Centre, May.

Shri. K.P. Sayed Koya, Officer - in - Charge, Narakkal inspected the official language implementation activities of Minicoy Research Centre from 4-5 February.

A three days Hindi workshop was organised for the Technical Officers/Staff of CMFRI from 18-20 February.

Smt. P.J. Sheela, Assistant Director (OL), attended a two-days National Hindi Seminar at Sree Sankaracharya Sanskrit University, Kaladi on 24 and 25 March.

Smt. Sheela inspected the implementation activities of Calicut Research Centre on 17 February and a Hindi Workshop was also organised from 16-18 February.

Smt. E.K. Uma, Senior Hindi Translator and Smt. E. Sasikala, Hindi Translator attended 5 days translation training course conducted by the Cochin Town Official Language Implementation Committee, at Income Tax Office, Cochin, 21-25 June.

## ENGAGEMENTS

Dr. M. Devaraj, Director attended the following meetings upto 31 March.

XVII meeting of the ICAR Regional Committee at Indian Bank Management Academy for Growth and Excellence (IMAGE) Conference Hall, Raja Annamalipuram, Chennai, 5-6 January.

Syndicate of Manomaniam Sundaranar University at Tamil Nadu State Council for Higher Education (TANSCH), Kamarajar Salai, Chennai, 7 January.

Discussions with Director of Fisheries, Govt. of TamilNadu and District Revenue Officer, Chengalpet regarding community pearl culture in the Gulf of Mannar and acquisition of land at Muthukad, 27-28 January.

Academic Council and Convocation at CIFE, Mumbai, 29 January.

Inaugurated the National Seminar on 'Development and Transfer of Fisheries Technologies,' and gave inaugural address at Fisheries College & Research Institute, Tuticorin, 3 February.

Visited the Chengal Village (near Udayamkulangara) an IVLP village of CTCRI, Trivandrum for taking up fish culture, 7 February.

Attended the Centre for

Development and Transfer of Mariculture Technologies (CDTMT) meeting at the office of the Director of Fisheries, Trivandrum, 8 February.

Discussion with Dr. M.V. Rao, Chairman of the ICAR Committee for reviewing the utility and functioning of Regional Centres of the Institute at New Delhi, 10 February.

Scientific Workers Conference of the Tamil Nadu Veterinary and Animal Sciences University at Madras Veterinary College, Chennai, 13 March.

Discussion with Dr. John Kurian, Professor, Centre for Development Studies, Ullor, and attended the two days Workshop on the 'Small Scale Fisheries of India', under the WHAT Commission, 25 March.

Visited Chengal village with Director, CTCRI, Trivandrum and DDG (Extn) under IVLP for taking up fish farming in the village, 26 March.

**Dr. V.N. Pillai, Director attended the following from 15 May onwards.**

Discussion with DDG (Fy) and other officials of ICAR, New Delhi on 27 and 28 May.

Research Advisory Committee meeting constituted by the Vice Chancellor, Madurai Kamaraj University, Madurai to monitor the research progress made under the ICAR National Professorship Project at the School of Biological Sciences, Madurai Kamaraj University, Madurai, 15 June.

### Others:

Dr.V.D. Deshmukh and V.V. Singh, Scientists participated and presented papers in the National Symposium on 'Ecophysiology and Conservation of Aquatic Resources', Institute of Sciences, Mumbai, 8-11 January.

Dr. Singh conducted the proceedings of the session on fisheries and aquaculture as Co-chairman and delivered a lecture to Ph.D. students of CIFE Mumbai on the topic 'Remote Sensing and its

TRAINING PROGRAMMES			
Title	Duration	No. of Participants	Venue
Application of Statistical Methods in Fisheries Research	7-27, January	10	Cochin
Sea Cucumber Farming	16-25, March	32	Lakshadweep
Low-cost Shrimp feed Production	19-24, April	13	Cochin

Application to Potential Fishery Zone in Indian Waters' on 15 January.

Dr. Singh participated in the second meeting on 'Use of Dry Ice' in Fishing Vessels organised at Fishery Survey of India, Mumbai, 18 January.

Dr. Singh participated in the 30th Consultative Group meeting of Fishery Survey of India, Mumbai, 15 March.

Dr. Singh participated in the Seminar on 'Fishing, Preservation and Processing of Krill and Antarctica Fish' arranged at CIFE, 15 April.

Dr. Singh delivered two lectures to the participants of training programme on Essentials of EIA Studies related to Aquaculture Projects in Hindi at CIFE, Mumbai, 24 March.

Dr. Singh delivered two lectures on 'Freshwater Aquaculture' and 'Integrated Fish Farming' in Hindi/ Marathi to the trainees of the training programme arranged by Government of Maharashtra and Konkan Krishi Vidyapeeth for the benefit of unemployed youth at Khar Land Research Station, Panavel, 4 May.

Dr. Kuber Vidyasagar, Dr. Deshmukh and Dr. Singh attended and presented a paper on 'Fishery resources along Maharashtra coast and scope for deep sea fishing', organised by Fishery Survey of India,

Mumbai and Karanja Machimar Vivid Karyakari Sahakari Society Ltd, Maharashtra, 16 January.

Dr. V.S.K. Chennubhotla, Principal Scientist and K. Vijayakumaran, Scientist, (Senior Scale) attended the National Seminar on 'Conservation and Management of Shrimp Resources of East Coast of India' organised by Forum of Fisheries, Visakhapatnam, 20 March.

Dr. Chennubhotla chaired a session in the International Conference on 'Environmental Problems and Prospects for 21st Century' conducted by Dept. of Environment, Andhra University and presented a paper, 3-5 June.

Dr. K. Vijayakumaran, Scientist, (Senior Scale) delivered a talk on 'Social audit towards sustainable development of coastal aquaculture', at the Forum of Fisheries Professionals at Visakhapatnam, 16 June.

Shri. S.G. Raje, Dr. Deshmukh and Dr. Singh delivered lectures for the participants of UGC sponsored refresher course in Zoology for Senior college teachers from 5-9 March.

Dr. Deshmukh participated in the Seminar on 'Biotechnological Applications- Relevance to the Indian Farmer,' organised by VSL Pune CII, New Delhi and MCC IA, Pune, 21 May.

Shri. M.Z. Khan attended the consultative group meeting of Mumbai Base at Fishery Survey of India, Mumbai, 29 June.

A total of 15 Scientists from CMFRI attended the National Symposium on 'Sustainable Development of Fisheries towards 2020 AD - Opportunities and Challenges,' organised by School of Industrial Fisheries, Cochin University of Science and Technology and presented research papers, 21-23 April.

### **Radio Talk**

Dr. Singh delivered a radio talk on 'Effect of Pollution on Fish Production,' 30 May.

### **Deputation abroad**

Dr. V. N. Pillai, Director attended the second Workshop on 'Ecosystem Analysis' under the ADB-RETA-5766 organised by ICLARM, Manila, Philippines, 7-11 June.

Dr. P. Jayasankar, Scientist (Senior Scale) was deputed to Japan for 3 months for overseas associateship (1996-'97) of Department of Biotechnology, Govt. of India. He worked on two projects namely.

1. AFLP polymorphisms for fish stock identification and
2. Isolation and Characterisation of SMAD4 gene in common carp at Department of Aquatic Biosciences, Tokyo University of Fisheries under the guidance of Prof. Nobuaki Okamoto, 18 January -17 April.

### Degree Awarded

Shri. V. P. Vipinkumar, Scientist, Calicut Research Centre of CMFRI was awarded gold medal for the outstanding performance and meritorious Ph.D. thesis of Indian Agricultural Research, New Delhi.



*Shri. V.P. Vipinkumar receiving the Gold Medal Award.*

Shri. G.S. Daniel Selvaraj, Senior Scientist received the Best Paper Award for his paper entitled "An approach to differentiated net photosynthetic and other biochemical production and consumption of oxygen in estuarine water bodies and aquaculture systems," during the National Seminar on "Development and



*Shri. G.S. Daniel Selvaraj receiving the best paper award.*

Transfer of Fisheries Technology" held at Fisheries College and Research Institute, Tuticorin, February.

### Visitors

#### Mandapam

Dr. P.K. Ghosh, Director, CSMCRI, Bhavanagar 18 June.

#### Cochin

Dr. Yeshbin Singh, IARI, New Delhi, 7 April.

Shri. N. Chaturvedi, Principal Secretary, Fisheries Department, Government of West Bengal 28 June.

### Appointments

Shri. Jose Kingsley as Technical Assistant (T-II-3) at Visakhapatnam, 6 January.

Shri. T.G. Tippeswamy as Technical Assistant (T-II-3) at Chennai, 14 December.

Shri. K.K. Suresh as Technical Assistant (T-II-3) at Vizhinjam, 1 February.

Smt. K.G. Sheela as Training Assistant (T-II-3) at KVK, Narakkal, 13 April.

Shri. Santhosh Kumar, P.S. as Technical Assistant (T-II-3) at Kochi, 18 May.

Shri. T.T. Ajith Kumar as

Technical Assistant (T-II-3) at Vizhinjam, 5 April.

Shri. A. Padmanabha as Senior Electrician (T-II-3) at Mandapam Camp, 20 April.

Shri. David, K.M. as Artist (T-I) at Mandapam Camp, 25 May.

Shri. Joseph Mathew as SSGr. I (Gestetner Operator) at Kochi, 9 April.

Smt. Vijayalakshmi Y. Gamanagatti as SSGr. I (Messenger) at Karwar, 6 May.

Shri. K. Thinakaran as SSGr. I (Deckhand) at Tuticorin, 10 May.

Smt. Suma N. as SSGr. I (Safaiwala) at Kochi, 1 January.

Shri. A. Bose as SSGr. I (Watchman) at Mandapam Camp, 10 February.

Shri. K. Narayanan as SSGr. I (Helper) at Mandapam Camp, 3 February.

Shri. M. Palanichamy as SSGr. I (Helper) at Mandapam Camp, 1 February.

Shri. K. Krishnan as SSGr. I (Watchman) at Mandapam Camp, 1 February.

### Promotions

Shri. K.M. Surendran, Senior Stenographer as Senior P.A. at Kochi,



28 December 1998.

Shri. K.S. Vaidyalingam, SSGr. III (Fieldman) as SSGr. IV (Fieldman) at Kochi, 10 February.

Shri. P. Ramu SSGr. II (Watchman) as SSGr. III (Watchman) at Mandapam Camp, 22 February.

Shri. K. Narasimha Murthy, SSGr. III (Lab Attendant) as SSGr. IV (Lab Attendant) at Kakinada, 10 March.

Shri. K. Velayudhan, SSGr. II (Watchman) as SSGr. III (Watchman) at Kochi, 23 February.

Shri. G. Chakrapani, SSGr. II (Watchman) as SSGr. III (Watchman) at Chennai, 25 February.

### **Transfers**

Shri. K.V. Somasekharan Nair, Senior Scientist from Kochi to FMC, Narakkal.

Shri. P.P. Manoj Kumar, Scientist from KVK, Narakkal, to Calicut.

Shri. P. Radhakrishnan, Technical Officer (T-6) from KVK, Narakkal to Headquarters, Kochi.

Shri. P. Thankappan, Technical Officer (T-5) Foreman from Mandapam Camp to Vizhinjam.

Shri. S. Mohan, Technical Assistant (T-II-3) from Mandapam Camp to Chennai.

Shri. S. Kemparaju, Technical Assistant (T-II-3) from Mangalore to Calicut.

Shri. T. Chandrasekhara Rao, Technical Assistant (T-II-3) from Machilipatinam to Kakinada.

Shri. J. Narayana Swamy, Technical Assistant (T-II-3) from Fisheries Harbour Laboratory to Kochi.

Shri. K.R. Mainkar, Junior Technical Assistant (T-2) from Malwan to Ratnagiri.

Shri. Thomas Kuruvila, Junior Technical Assistant (T-2) from Fisheries Harbour Laboratory to Kochi.

Shri. S.D. Kamble, Junior Technical Assistant (T-2) from Mumbai to Ratnagiri.

Shri. P. Achayya, Junior Technical Assistant (T-2) from Kakinada to Machilipatinam.

Shri. B.N. Katkar, Technical Assistant (T-I-3) from Ratnagiri to Mumbai.

Shri. K. Alagirisamy, Motor Driver, (T-1) from Mandapam Camp to Vizhinjam.

Shri. S. Rajan, Field Assistant (T-1) from Kovalam to Chennai.

Shri. K.C. Hezhakiel, Field Assistant from Fisheries Harbour Laboratory to Kochi.

Shri. S. Erishkesan, Senior Clerk from Kochi to Vizhinjam.

Shri. C. Jayakanthan, Junior Clerk from Vizhinjam to Kochi.

Shri. R.V.S. Subramanyan, Junior Clerk from Kochi to Visakhapatnam.

Shri. M.R. Bharathan, SSGr. IV (Deckhand) from Mandapam to Calicut.

### **Inter - Institutional Transfer**

Dr. L. Krishnan as Senior Scientist from CIBA, Narakkal to Cochin, 1 May.

Shri. S. Chatterjee, Senior Administrative Officer from CMFRI, Kochi to CIFT, Kochi 4, January.

Shri. B. Vijayakumar, Assistant Administrative Officer from KVK Narakkal to National Research Centre on Banana, Trichy, 5 June.

Shri. N. Viswambharan, as Assistant Administrative Officer from NRC on Banana, Trichy to KVK Narakkal, 8 June.

Shri. Hameed Batcha, as Technical Assistant (T-II-3) from CARL, Port Blair to Tuticorin, 24 May.

Smt. P. Ammajee, Senior Library Assistant (T-II-3) from CMFRI, Kochi to IASRI, New Delhi, 22 January.

January.

Shri. V. Antony as Field Assistant (T-1) from IVRI Izatnagar to Mangalore, 11 June.

### **Relief**

Shri. K. Dorairaj, Principal Scientist at Chennai retired on superannuation, 31 December.

Dr. P.S. Kuriakose, Principal Scientist at Calicut retired on superannuation, 31 May.

Dr. M.K. George, Senior Scientist at Kochi retired on superannuation 31 January.

Shri. Varughese Philipose, Technical Officer (T-8) at Kochi retired on superannuation, 30 April.

Shri. K. Ramakrishnan Nair, Technical Officer, (T-5) at Vizhinjam, retired on superannuation, 30 April.

Shri. G. Krishnan Kutty Nair,

Technical Officer (T-5) at Kochi, retired on superannuation, 28 February.

Shri. A.A.P. Mudaliar, Technical Officer (T-5) at Tuticorin, retired on superannuation, 28 February.

Shri. V. Suresh, Technical Officer (T-5) at Kochi retired on superannuation, 31 May.

Shri. C. Ramadoss, SSGR. II (LA) at Mandapam retired on attaining the age of superannuation, 30 April.

Smt. K.K. Kalliani, SSGR. II (Saffaiwala) at Kochi, retired on superannuation, 31 January.

Shri. Ramanna Sapaliga, SSGR.III (Watchman) at Mangalore, retired on superannuation, 28 February.

### **Voluntary retirement**

Shri. C.B. Shirodhkar, SSGR. II

(Watchman) at Mangalore on voluntary retirement, 1 January.

Shri. V.G. Kubal, SSGR.III (Lascar) at Mangalore on voluntary retirement, 1 April.

### **Deputation**

Dr. B. Manoj Kumar, Scientist at Veraval has been relieved on deputation to Kerala Agri. University, Fisheries College, Panangad, 7 May.

### **Removal**

Shri. M. Sankaran, SSGR. II (Fieldman) at Tuticorin was removed from service, with effect from 21 August 1997.

### **Obituary**

Shri. S. Natarajan, Technical Officer (T-9) at Chennai, 3 March.

Smt. G. Chitra, Field Assistant (T-1) at Mandapam Camp, 15 April.