हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद
Agrisearch with a human touch

CIFRI News

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January - June 2011

From Director's Desk

I am proud to bring research and other achievements of the institute during January to June, 2011. Climate change is one of the gravest threats to all living organisms on the earth including human beings and fish community. CIFRI studied its impact on fisheries and freshwater aquaculture. It was found that there is perceptible geographic shift of warm water fish species to the colder stretch. Higher temperature was a prime factor in early maturation and advancement of breeding period in hatcheries. Further, it has been observed that 11% area of the South 24 Parganas district of West Bengal is highly vulnerable to sea level rise. Sunderbans being the World Heritage for biodiversity have been surveyed intensively for fish diversity. The fish assemblage data revealed a total of 215 fish species in the area. Sufficient environmental flow is a pre-requisite for rivers to sustain the ecosystem health and fish stocks. CIFRI estimated the environmental flow requirement for sustenance of ecology and fish diversity in Nyamjang Chhu river of Arunachal Pradesh, where a hydroelectric power project is coming up. It was recommended to release minimum of 3.5 cumsec from the barrage to sustain the ecology. CIFRI assessed the nutrient composition of some indigenous fishes from Bramhaputra river and showed that they are rich source of protein, minerals and fats. The institute has prepared a muscle proteomap of IMC *Catla catla*. This is the first reported information for major aquaculture species in India. Adoption of technologies is the testimony of their applicability in the field. CIFRI's pen culture technology using locally available and low cost inputs was successfully adopted in Assam.

Institute scientists have published number of papers and book chapters during the current period besides four technical bulletins in English and one in Hindi. The institute successfully organized two meetings of Planning Commission of subgroup on "Inland Fisheries, Freshwater and Cold water Aquaculture". The Research advisory Committee and Institute Research Committee Meetings were also held during this period. CIFRI celebrated Republic Day, Institute Foundation Day with great vigour and enthusiasm. It also organized one day seminar on 'Sustainable fisheries development in beels' in collaboration with Assam Fisheries Development Corporation at Guwahati. The inland fisheries stakeholders participated in a workshop for shaping the Vision 2030 document of the institute. All these events were grand success and highly appreciated by the participants.

A total of 12 training programmes and 10 mass awareness campaigns have been organized in headquarters and different centres of CIFRI. These were for fisheries officers, fishers and other staffs of ICAR and SAUs. CIFRI technologies and achievements were showcased in four exhibitions in different parts of the country. Its exhibition stall got appreciation Award in All India Krishi Vigyan Mela. Some of the CIFRI's scientific staffs were awarded Ph. D. degree during the period.

Number of scientific, technical and administrative staff superannuated during this period. We wish all of them a happy, active and healthy retired life. Some of the CIFRI staffs were promoted or transferred across institute centers and headquarters. Seven new scientists and one Senior Finance and Accounts Officer have joined CIFRI. I cordially welcome them and wish good luck.

Before signing off from this issue of news letter, I deeply appreciate the efforts of all the CIFRI staff to take the institute ahead.

Any suggestions from our learned readers for improvement of the newsletter and performance of institute will be highly appreciated.

Barrackpore,
January, 2012

A. P. Sharma

CONTENTS

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Research Updates

Fish communities of the Sunderbans estuarine system

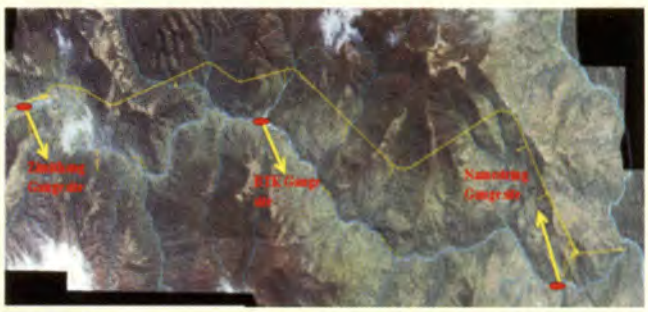
Sunderbans represent the largest single chunk of deltaic mangrove forest on this planet. It is unique and declared as a World Heritage Site due to its species richness in terms of diverse mangrove flora and mangrove associated fauna. Its fish communities have been studied in detail by several exploratory surveys of the Sunderban reclaimed zones, the Sunderban Tiger Reserve (STR) and two wildlife sanctuaries. For quantifying the fish assemblages, the fish abundance data were analyzed by using PRIMER software package (version 6). The collected fish samples belonged to 215 species under 158 genera, 63 families and 16 orders. Overall catch composition showed *Escualosa thoracata* as the most abundant species (in number) contributing to over 42% of the total catches followed by *Harpadon nehereus* (14%), *Otolithoides pama* and *Stolephorus indicus* (5 %). Cluster analysis revealed that there is significant difference in the fish assemblages between the Hooghly and Thakuran-Matla zone which can be attributed to the increased freshwater flow to the Hooghly estuary due to water release from Farakka Barrage, thereby reducing the salinity to almost freshwater values in Nischintapur and Kakdwip during monsoon season.

C. M. Roshith, R. K. Manna and Utpal Bhaumik

CIFRI Conducted environmental flow investigations for sustenance of ecology and fish biodiversity in Nyamjang Chhu river, Arunachal Pradesh

Sufficient environmental flow is a compulsory requirement for rivers to sustain their ecosystem health and fish stocks. It is particularly important for the downstream river stretch of dams/ hydroelectric projects. With this backdrop, CIFRI investigated an upcoming hydroelectric project on river Nyamjang Chhu for one year. The project is located between Zimithang and Kumba. The diversion site is located near Zimithang, while the powerhouse is near confluence of Nyamjang Chhu and Tawang Chhu rivers. It is approximately 25 km from the barrage site. It has been proposed that the length of the barrage would be 174.50 m and the maximum height of barrage above average river bed level would be 10.20 m. The biological and chemical parameters & fish species diversity and abundance were analysed to know about the water quality and fisheries of the river. The holistic methods, namely, Tennant method, Huges & Munster Method and Building Block Method were used for estimation of environmental flow for Namjang Chu river. The required flow depth and flow velocity could be achieved by minimum release of 3.5 Cumec from the barrage which will create a cross-sectional spreading area of 10.29 m^2 with a depth of 0.55 m and width of 18.71 m at the critical zone in Nyamjang Chhu river. This will support for the sustenance of ichthyofaunal habitat in the river Nyamjang Chhu.

A. K. Sahoo, Utpal Bhaumik, B.K.Bhattacharjya, D. Debnath and A.P.Sharma

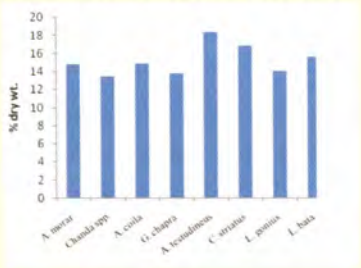


Gauge and discharge measurement sites on Nyamjang Chhu River

Cast net fishing at Zimmithang

CIFRI assessed the nutrient composition of selected indigenous fishes from river Brahmaputra

Most small and medium-sized indigenous fish species occurring in River Brahmaputra are relished by the people of Northeastern India and are usually preferred over bigger fishes. Proximate composition of selected indigenous fishes of the river was assessed for their nutritional values. Samples of *Aspidoparia morar*, *Chanda* spp., *Ailia coila*, *Gudusia chapra*, *Anabas testudineus*, *Channa striatus*, *Labeo gonius* and *Labeo bata* were collected from Uzanbazar (Guwahati) landing centre of R. Brahmaputra. Among the species, *A. testudineus* had significantly higher ($P<0.01$) protein (18.38% on dry weight basis), lipid (12.48%) and ash (8.03%) contents together with lowest moisture content (59.79%). *C. striatus* also had higher protein content (16.78%) compared to the other species. Proximate composition of different sizes of *A. morar*, *Chanda* spp. and *A. coila* were compared. Moisture content decreased with increasing size in



Crude protein content (% dry wt.) of the different fish species

Small indigenous fish species of R. Brahmaputra

all the three species with just the opposite trend in case of lipid content. However, protein contents were similar among the species except in case of *A. coila* where larger fishes showed significantly ($P<0.01$) higher protein content. It could be concluded that the selected small indigenous fish species are rich source of protein food (having 11-19% crude protein), high quality fats (2.33 to 12.5%) and also rich in mineral contents (2.18 to 8.03% ash). Among the selected fish species, *A. testudineus* commanded the highest wholesale price (200-400/kg depending on size) followed by *L. bata* (200-300/kg), *C. striatus* (150-300/kg), *A. coila* (100-300/kg), *A. morar* (100-300/kg), *L. gonius* (150-200/kg), *G. chapra* (80-150/kg) and *Chanda* spp. (80-90/kg), the scientific basis for which needs to be studied by assessing taste and flavor giving components (e.g., free amino acid, free fatty acid, volatile base nitrogen, *etc.*).

D. Debnath, S. Yengkokpam, B. K. Bhattacharjya, K. K. Sarma, P. Gogoi and A. Kakati

CIFRI Pen culture technology was adopted in Sonitpur district of Assam

CIFRI developed pen aquaculture technology using locally available and low-cost materials for raising carp fingerlings as stocking materials in the beels of Assam state based on extensive field trials conducted during 1996-1998 and demonstration during 2000-2004. The technology was adopted by two Self-Help Group (SHG) and one Non-governmental Organization (NGO) of Sonitpur district of Assam. The first SHG (Rangapani *Beel Atmasahayak Got*) carried out pen culture in Rangapani beel for raising table-size carps. Two numbers of pen enclosures covering 0.24 ha area each were erected in the beel at a cost of 1,30,844 during 2008-09 under Mahatma

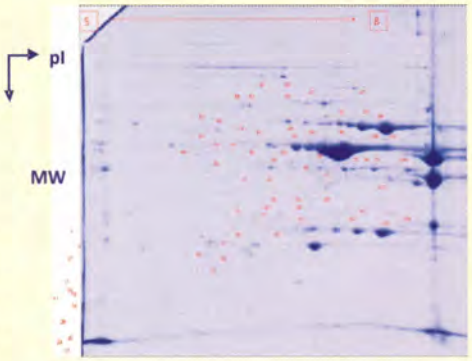
Pen culture by *beel* SHG in Sonitpur, Assam

Pen culture by Maandal NGO in Kachu *beel*, Sonitpur district, Assam

Gandhi National Rural Employment Guarantee Scheme (MNREGS). The District Fisheries Office, Sonitpur provided technical guidance following CIFRI Technology package. The SHG stocked Catla, rohu, mrigal, silver carp, common carp and grass carp @ 6000 fingerlings/ha and good fish production was obtained (2,400 kg/ha). Another SHG, Nayanjyoti (village Parmaighuli, Balipara Block) also took up pen culture in Rangapani jan beel in April 2010. The total cost including construction, seed and feed was ₹ 1,06,000 of which 85% was borne by the Fisheries Department. Another pen culture operation was successfully taken up by an NGO (Maandal) in Kachu beel, village Chiloni, Sonitpur District covering an area of 1.35 ha in the year 2009-2010 involving a total cost of ₹ 3,73,950.

B. K. Bhattacharjya, D. Debnath, S. Yengkokpam, K. K. Sarma, P. Gogoi and V. Kolekar

Fish Proteomics - Muscle proteome of Indian major carp *Catla catla*



Little information is available on the genomic and proteomic aspects of fish species in India. Technical advances in highthroughput screening of peptides by mass spectrometry have established new ways of identifying entire cellular proteins in one swift analytical approach. Muscle constitutes the major biomass in fish. Many species of fish provide a natural model system to understand the molecular changes resulting from remodeling of muscle. CIFRI has generated the muscle proteome of IMC *Catla catla.* About 60% of the proteins were identified using combination of proteomic tools like 2-D GE, immunoblotting, MALDI-TOF-MS and LC-MS-MS. The protein spots identified include glyceraldehyde-3-phosphate dehydrogenase, creatine kinase M1, creatine kinase M2, phosphoglycerate kinase, phosphoglucomutase, apolipoprotein, enolase, aldolase A, β-actin, glutamic-oxaloacetic transaminase, pyruvate kinase, α-1 antitrypsin, phosphorylase, triosephosphate isomerase, lactate dehydrogenase, transferrin variant F, zgc protein, novel protein similar to vertebrae desmoplakin (DSP), novel protein similar to vertebrae Rho guanine nucleotide exchange. This is the first such information for any major aquaculture species in India. It would serve as the base line information for stimulating further research on proteo-genomics of catla and other fish species for biotechnological interventions for better fish health and disease management and species authentication for meeting international labeling regulations, improving flesh quality and increased productivity.

B. P. Mohanty, A. P. Sharma

How does climate change affect inland fisheries in India?

CIFRI pioneering study on impact of climate change in inland fisheries brought to light some interesting findings. Analysis of rainfall, temperature and fish diversity data of 30 years in river Ganga and its plains revealed a perceptible geographic shift of warm water fishes *G. giuris P. ticto, X. cancila, M. vittatus, Catla catla* to the colder stretch of Haridwar where mean annual minimum water temperature increased by 1.6 °C. Stenothermal phytoplankters *Amphicampus, Tetracycles, Diatoma* and *Ceratoneus* have become insignificant in the cold stretch of river Ganga due to enhanced temperature.

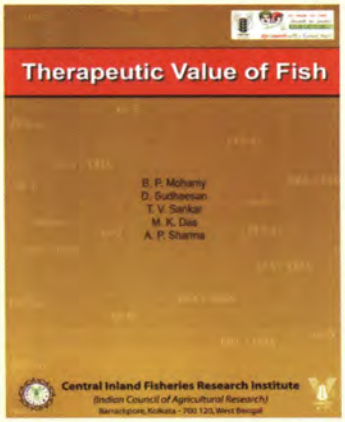
In freshwater aquaculture a positive impact of enhanced temperature and alteration of rainfall pattern on spawning of Indian Major Carps was evident. It was a prime factor triggering early maturation and advancement of breeding period in hatcheries of West Bengal and Orissa in the last two decades. An extended breeding period by 45-60 days with breeding season extending from 110-120 to 160-170 days was witnessed. Impact of extreme events like drought and cyclones on inland fisheries was also studied. Deficient rainfall of 29% in North 24 Parganas, 27% in Bankura, 23% in Burdwan and 34% in Hooghly during the March to September were recorded during 2009-10 drought in West Bengal. It affected fish breeding and rearing in West Bengal and recorded 61% and 73% loss of fish seed in North 24 Parganas and Bankura, respectively compared to the last four years average. As an adaptation option 80 % of the hatcheries due to the drought condition diverted from rearing Indian Major Carps to other species like Pangasius (*Pangasius sutchi)*, *Puntius javanicus* and *C. garipenus*, which favourably adapt to water stress and high temperature condition.

Cyclonic events like AILA frequently occur in coastal areas of West Bengal. As a preparedness for combating the impact of such events on inland fisheries, Digital Elevation Model (DEM) of South 24 Parganas was generated. It revealed submergence of 3% land in case of 1m sea level increase. But, with cyclonic sea ingress upto 2m, agricultural fields and aquaculture pond are affected. A total of 11% area of South 24 Parganas is highly vulnerable to 1-2 m rise of sea level during cyclonic events.

M. K. Das, P. K. Saha, S. K. Sahu, P. K. Srivastava, S. Dey

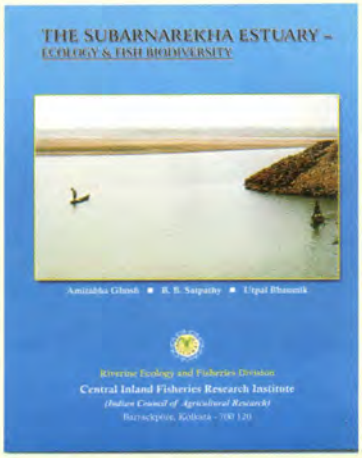
Hatchery in West Bengal

Publications



Therapeutic Value of Fish

Fish is used for treating many ailments and expected to go a long way to prevent protein-calorie malnutrition prevailing in the underdeveloped and developed countries. Fish is a rich source of polyunsaturated fatty acids (PUFAs); omega-3 PUFAs are effectively being used in nutraceuticals for reducing coronary diseases, osteoarthritis, dementia, age-related muscular degeneration, asthma and depression. Fish is being used in ethnomedicine, spas for icthyotherapy and in various other therapeutic purposes. The bulletin documented the therapeutic benefits of fishes. The salient research results on the therapeutic value of important fishes like *Clarias batrachus, Anabas testudineus, and Heteropneustes* fosilis explained the scientific basis of the perceived therapeutic value of these fishes. The document also provides the basic information for building it further into a Hand book onTherapeutic values of fish.

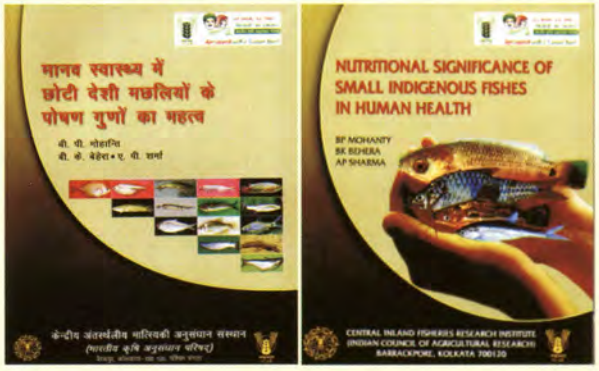


The Subarnarekha Estuary - Ecology & Fish Biodiversity

This publication on *"The Subarnarekha Estuary- Ecology & Fish Biodiversity"* gives a comprehensive check list of fish species of Subarnarekha estuary, including a range of euyhaline esturaine fresh water and marine species. It is a testimony to habitat suitability for feeding, breeding and nursery grounds and sustenance of bio-diversity conservation. The base line information on the physical, chemical, and hydrological aspects is provided to manage and enhance fish and biota of the estuary. The document would provide a vital base for future studies on fisheries resources in Subarnarekha estuary.

Tenualosa illisha - A Rich Source of omega-3 Fatty Acids

Hilsa is a highly prized food fish of our country and accounts for 15-20% of the total fish landings of Hooghly estuary. It refers hilsa as 'salmon of the east' by comparing the nutritional values of both the fishes. The nutrient profile of Hilsa and its importance in the human health is the subject matter of this publication. Hilsa is a rich source of omega-3 fatty acids which play a major role in providing pharmaceutical elements for physiological maintenance of body tissue. The acids reduce the risk of heart diseases, stroke, hypertension, diabetes, arthritis, age-related dementia and childhood asthma. It is a useful publication which highlights the importance of hilsa and further research can be helpful in providing a complete knowledge on the species.



Nuttritional Significance of Small Indigenous Fishes in Human Health

Small indigenous fishes (SIFs) contribute greatly to human nutrition particularly for the rural poor community. Besides being an important source of proteins, the SIFs are rich source of micronutrients (minerals and vitamins). The nutrient profile of these species is rarely documented. The bulletin is to fill this gap and provide nutrient profile of small indigenous fishes and their significance on human health. It will create awareness among the member of other society groups also to consume SIFs. The bulletin is also published in Hindi to popularise SIFs in different regions of the country.

Trainings

Name of the Training	Date	Venue	No. of participants
Sampling Methodology for Inland Fish Catch Estimation and Catch Assessment Survey (IFMS) Software	4-7 January, 2011	CIFRI, Barrackpore	Fisheries Officers from Meghalaya, Manipur, Orissa and Bihar
Sampling Methodology for Fish Catch Estimation in Inland Water bodies & Coastal Areas and Catch Assessment Survey (IFMS) Software	6-7 January, 2011	CIFRI, Bangalore	Fishery Officers from Karnataka and Goa
Sampling Methodology for Fish Catch Estimation in Inland Waterbodies & Coastal Areas and Catch Assessment Survey (IFMS) Software	18-19 January, 2011	CIFRI, Bangalore	Fishery Officers from Kerala and Orissa
Data collection on Fish and Fish Pond Resource to a during 31.01.2011 to 07.02.2011 under Central Sector Scheme	31 January to 07 Februar y, 2011	CIFRI, Allahabad	the 54 Fishery Friends selected from 6 districts of Haryana
Data Analysis using SAS Software	14-19 February, 2011	CIFRI, Barrackpore in collaboration with DWM, Bhubaneswar	Thirty-three Personnel from two universities and two ICAR Institutes
Sampling Methodology for Inland Fish Catch Estimation and Catch Assessment survey (IFMS) Software	21-24 February, 2011	CIFRI, Barrackpore	Fisheries Officers from Arunachal Pradesh, Mizoram and Assam
Inland Fisheries Development	22-28 February, 2011	CIFRI, Barrackpore	Eighteen Fishers from Angule district of Orissa
Integrated Fish Farming for Livelihood Security	21-26 March, 2011	CIFRI, Kolkata	26 Participants from different regions of the Sunderbans
Fisheries Diversification and Fish Production Enhancement from Wetlands	27 March, 2011	Jagat Sagar wetland, Madhya Pradesh	60 Fishers
Strengthening of Database and Geographical Information System for Fisheries Sector	24-27 March, 20 11	CIFR,I Allahabad	Five State Fisheries Officials of Chhatisgarh and Uttar Pradesh
Inland Fisheries Management	8-13 June 2011	CIFRI, Barrackpore	38 District Fisheries Officers of Bihar
Inland Fisheries Development	21-30 June 2011	CIFRI, Barrackpore	29 Fish Farmers from three districts (Vishali, Patna and Sheikhpura) of Bihar

Mass Awarness Campaigns

Name of Mass Awareness	Date	Venue	No. of participants
Harmful Effects of Unwanted Fish Larvae and Seed Destruction During Prawn Seed Collection at Hooghly Estuary	06 January, 2011	Baliara (Bakkhali), South 24-Parganas, West Bengal	80 Fisher Women
Utilization of Floodplains for Enhancement of Fish Production	28 January, 2011	Moyna, Purba Medinipur, West Bengal	53 Fishers including 36 Women
Conservation and Sustainable Fish Production Enhancement	28 January, 2011	East Midnapur	36 Fish Farmer
Intellectual Property Rights under ITMU	05 March, 2011	CIFRI, Barrackpore	CIFRI Staff Members
Integrated Fish Farming for Livelihood Security	21-26 March, 2011	Kolkata Station of CIFRI	21 Fishers and Five Students
Fish Seed Rearing in Cage and Pen for Beel Stocking	19 May, 2011	Mathura beel, Kanchrapara	44 Fish Farmer
Conservation of Economically Important Estuarine Fish Seed in Hooghly Estuary	27 May, 2011	Kalisthan, South 24 Parganas, West Bengal	60 Fishers
Need for Conservation of Fish & Fish Juveniles	06 June, 2011	Bokkhali, 24 - Parganas (South)	80 Fisheries Worker
Unwanted Fish Larvae and Fish Seed Destruction During Prawn Seed Collection at Hooghly Estuarine.	16 June, 2011	Godakhali, 24 Parganas (South)	50 Fish Farmers
Scopes and Use of the Consortium one - Resources in Agriculture (CERA)	29 June, 2011	CIFRI, Barrackpore	Staff of CIFRI, Barrackpore

Exhibitions

Name of exhibitions	Date	Venue
Asia Pacific Aquaculture - 2011	17 - 20 January, 2011	Hotel L Meridian, Kochi, Kerala
5th Assam Matsya Mahotsav	27 - 29 January, 2011	Shilpagram, Guwahati, Assam
Agrivision 2011	10 - 12 February, 2011	National Bureau of Fish Genetic Resources, Lucknow
All India *Krishi Vigyan Mela* 2011	3 - 5 March , 2011	Indian Agricultural Research Institute, New Delhi

Awards

The Exhibition Stall of Allahabad Regional Centre of CIFRI got Appreciation Award in the All India Krishi Vigyan Mela 2011 organized by IARI, Pusa, New Delhi from 3-5 March 2011.

Dr. Debabrata Panda successfully completed his doctoral degree on research problem "biology and stock assessment of two species of carangids from mumbai waters". From CIFE, Mumbai. He investigated the food and feeding habit, maturity, fecundity, growth, mortality, recruitment and stock status of *D. Russelli* and *M. Cordyla* in mumbai waters and observed a threat of depletion for their stock

Dr. Sajina has been awarded doctoral degree from CIFE, Mumbai for her research work on "Stock Structure Analysis of Horse Mackerel, *Megalaspis cordyla* (Linnaeus, 1758), along Indian Coast". She identified discrete stocks of *M. cordyla* in Bay of Bengal along the east coast of India and suggested to assess and manage horse mackerel population separately. She observed considerable mixing of the Cochin and Mumbai populations of horse mackerel and similarities between them. She recommended for uniform management strategies for *M. cordyla* populations in Arabian Sea along the west coast of India.

The research work of Dr. Soma Das on "Morphological and molecular characterization of *Sargassum* spp from selected location along Indian coast" provided her the Ph. D degree from CIFE, Mumbai. She conducted taxonomic characterization of morphological traits (shape and size of leaves, vesicles, male receptacles and female receptacles, etc) of *Sargassum* spp at East and Western edge of Indian coastline. The amplification of mitochondrial 23S ribosomal (r) DNA ITS (Internal Transcribed Spacer) region and PCR RFLP analysis led to development of species specific molecular markers.

Dr. Amiya Kumar Sahoo was conferred with Ph. D degree at Karnataka Veterinary, Animal and Fishery Science University (KVAFSU), Bidar for his doctoral research "Monoclonal antibodies for antigen characterization and detection of *Macrobrachium rosenbergii* Nodavirus (*Mr*NV)". He produced a panel of monoclonal antibodies against White tail disease of giant freshwater prawn caused by *Mr*NV and developed a simple immunodot assay.

Superannuation

Name & Designation	Place of Last Posting	Date of Superannuation
Dr. K. R. Naskar, Pr. Scientist	CIFRI, Kolkata	31 January, 2011
Shri M. L. Saha, SSS	CIFRI, Barrackpore	31 January, 2011
Dr. N. P. Srivastava, Pr. Scientist	CIFRI, Barrackpore	28 February, 2011
Ms. K. S. Mondal, SSS	CIFRI, Allahabad	28 February, 2011
Shri Sree Nath, SSS	CIFRI, Allahabad	06 March, 2011
Shri D. Chatterjee, T- 4	CIFRI, Barrackpore	31 March, 2011
Shri S. K. Bose, Assistant	CIFRI, Barrackpore	31 March, 2011
Shri B. N. Mondal, SSS	CIFRI, Barrackpore	31 March, 2011
Shri J. Ray, AAO	CIFRI, Barrackpore	30 April, 2011
Shri N. R. Kundu, Assistant	CIFRI, Barrackpore	30 April, 2011
Shri N. C. Biswas, T - 5 (Driver)	CIFRI, Barrackpore	30 April, 2011

Promotions

Name & Designation	Promoted to	With effect from
Dr. M. A. Hassan	Principal Scientist	21 July, 2008
Shri Swapan Kumar Ghosh	T - 5	01 July, 2007
Shri N. C. Biswas	T - 5	01 January, 2008
Shri U. K. Chatterjee	T - 5	01 January, 2008
Shri D. Chatterjee	T - 5	03 February, 2010
Shri B. N. Das	T - 5	03 February, 2010
Shri K. P. Singh	T - 5	03 February, 2010
Shri R. K. Sah	T - 4	03 February, 2010
Shri S. K. Dev	T - 4	03 February, 2010
Shri A. Roy Chowdhury	T - 4	27 August, 2010

New Appointments

Name & Designation	Place of Posting	With effect from
Ms. Deepa Sudheesan, Scientist	Barrackpore	10 January, 2011
Ms. Sajina A. M., Scientist	Barrackpore	10 January, 2011
Ms. Soma Das, Scientist	Barrackpore	10 January, 2011
Shri Rajesh Sahay, SF & AO	Barrackpore	25 January, 2011
Dr. Arun Pandit, Senior Scientist	Barrackpore	19 April, 2011
Dr. S. K. Das, Senior Scientist	Barrackpore	23 April, 2011
Shri Dharmendra Kumar Meena, Scientist	Barrackpore	02 May, 2011
Dr. S. K. Nag, Senior Scientist	Barrackpore	05 May, 2011

Transfers

Name & Designation	From	To
Shri K.P. Nath, Finance & Accounts Officer	CIFRI, Barrackpore	CRIJAF, Barrackpore
Mr. P. R. Rao, Assistant Director (OL)	CIFRI, Barrackpore	ICAR HQs, New Delhi
Mr. Dileep Kumar, Assistant	CIFRI, Barrackpore	NRC for Litchi, Bihar
Mr. R. K.Ghosh, Assistant Finance & Accounts Officer	CIFRI, Barrackpore	NIRJAFT, Kolkata
Dr. R. K. Paul, Scientist	CIFRI, Barrackpore	IASRI, New Delhi
Dr. A. K. Prusty, Scientist	CIFRI, Vadodara	PDFSR, Meerut
Ms. K. Jacquline, T-6	CIFRI, Barrackpore	CIBA, Chennai

Meetings

Research Advisory Committee Meeting

The Research Advisory Committee meeting of the Central Inland Fisheries Institute for the year 2011 was convened during the 9-10th April 2011 at CIFRI Barrackpore under the Chairmanship of Dr. R. K. Sinha. The Chairman highlighted the challenges for open water fisheries and emphasised upon the issues of poor adoption of inland fisheries technologies and stressed the need for developing appropriate technologies by practitioners and package of practices to meet the greater expectations of the public and policy makers and strong dissemination mechanisms. He reiterated the need for change in orientation of CIFRI programs in NRM footsteps during the XII plan. Dr. S. D. Singh, ADG (I. Fy), ICAR stressed on the need for synergizing opinion to resolve the conflict between conservation and increasing fish production and called for efforts towards sustainability. Director, Prof. A. P. Sharma in his concluding remarks assured that the recommendations will be implemented.

Planning Commission Meeting of Subgroup on " Inland Fisheries, Freshwater Aquaculture and Coldwater Aquaculture"

The first meeting of Planning Commission subgroup on 'Inland Fisheries and Coldwater Aquaculture' for XII Five Year Plan was held at CIFRI, Barrackpore on May 10, 2011. The meeting was attended by the Chairman of Working Group, Dr. Dilip Kumar, members of sub group, special invitees and CIFRI scientists. The Chairman stressed to promote inclusive growth through judicious utilization of fisheries and aquaculture resources and to mobilize the inland fisheries and aquaculture potential for ensuring rural livelihood support The suggestions given for the development of the sector were: productivity enhancement for inland fisheries, aquaculture and cold water fisheries; seed production, seed certification, quarantine and disease surveillance facilities, strengthening of database, infrastructure development, value addition and post harvest technologies and government policies and human resource development.

II meeting of Planning Commission Subgroup on "Inland Fisheries, Freshwater Aquaculture and Coldwater Aquaculture"

The second meeting of Planning Commission subgroup on 'Inland Fisheries and Freshwater and Aquaculture' for XII Five Year Plan was held at CIFRI, Barrackpore on May 31, 2011. Most of the working sub group members and the chairman attended the meeting. The meeting was primarily to formulate fisheries development schemes for XII Plan based on the suggestions received from different stakeholders. Besides ongoing schemes number of new schemes were suggested on: integrated schemes like fish-cum-dairy, fish-cum-duckery, fish-cum-pig in selected states, encourage entrepreneurship for new fishery graduates and weed clearance in floodplain wetlands.

Institute Research Committee Meeting

The Annual meeting of Institute Research Committee was held during June 26-29, 2011 at Barrackpore. Prof. A. P. Sharma, Director, and Chairman, IRC presided over the meeting. Prof. R. K. Sinha, Chairman RAC, CIFRI attended the meeting on June 26, 2011. All the Heads of Division (HoDs) and scientists of all cadres participated in this important meeting. Prof. Sharma informed the house about institutional, externally funded and consultancy projects executed by the Institute. In view of the reorientation of Institute research programme towards an NRM approach, he asked the scientists to shift emphasis on holistic research management considering multiple use of the aquatic ecosystems besides fisheries. He encouraged the scientists to bid for competitive grant projects of different national and international agencies, *e.g.* DST, DBT, NFDB, CGIAR, *etc.* Prof. R. K. Sinha pinpointed the changing research environment with improvement of technology and distribution of time of scientists. He advised to have more research on water availability, environmental flow and application of models to solve these problems. Prof. Sharma made a presentation on "Prioritizing research on inland fisheries and aquatic ecosystem management". He raised number of prioritized research issues for inland fisheries, which need to be addressed during XII Plan.

Events

Republic Day

The Republic Day was celebrated on January 26, 2011 at the institute with great enthusiasm. All the institute staff and their family members attended the function. Prof. A. P. Sharma, The Director, CIFRI addressed the gathering and appealed the institute staff to performed their best towards progress and development of the institute. Small cultural programme was also organised at the occasion.

Seminar on "Sustainable fisheries development in *beels*"

The CIFRI Regional Centre, Guwahati successfully organized a one-day seminar on 'Sustainable fisheries development in *beels*' in collaboration with Assam Fisheries Development Corporation (AFDC), Guwahati on 27.01.2011 at Shilpagram, Guwahati commemorating with the 5th Assam Matsya Mahotsav. A total of 67 beel lessees and fishers from all over Assam participated in the seminar. The dignitaries like Prof. Sharma, Director, CIFRI, Barrackpore Dr. Anupam Roy, IAS, Secretary, Fisheries Department, Government of Assam, Syed Raisul Islam, ACS, Managing Director, AFDC, Guwahati; Shri S. Purakayastha, Nodal Officer (AACP), Directorate of Fisheries, Assam, and Dr. B. C. Jha, Head, Reservoir and Wetlands Division, CIFRI, Barrackpore graced the occasion. The technical programme was conducted in an interactive manner encouraging the participants to important issues/ problems faced by them in undertaking sustainable fisheries development in beels duly moderated by the researchers from CIFRI and officials from AFDC.

CIFRI Annul Day

The CIFRI foundation Day was organised on 17 March, 2011 at Barrackpore to commemorate the 65th Foundation Day of the institute. Various activities were conducted to mark the occasion. Dr. S. A. H. Abidi, Former Vice- Chancellor, Central Institute of Fisheries Education, Mumbai delivered a lecture. An expert consultation was also organized on 'Inland Open Water Fisheries - Problems and Research Needs'. Dr. P. Das, Former Director, NBFGR chaired the consultation session. Many eminent scientists and stakeholders attended the session.

Stakeholder Workshop for CIFRI Vision 2030

Stakeholder Workshop was organized for discussing and finalisation of CIFRI Vision 2030. Many eminent scientists and experts, *e.g.* Dr. P. Das, Former Director, NBFGR, Lucknow, Prof. N. C. Dutta, Former Head, Department of Zoology, University of Calcutta, Dr. M. K. Mukhopadhyay and Dr. N. P. Shrivastava, Former Principal Scientists, CIFRI participated actively in the workshop, besides institute scientific staff. Dr. K. D. Joshi presented the draft vision document for comments and suggestions. Number of good suggestions came up for improving the research and extension activities for all the inland waters.

हर कदम, हर डगर
किसानों का हमसफर
भारतीय कृषि अनुसंधान परिषद
Agrisearch with a human touch

सिफरी समाचार

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निदेशक की ओर से

जनवरी से जून, 2011 के दौरान हुई संस्थान की प्रगति व विकास से आप सभी को अवगत कराते हुये मै बहुत ही गर्व का अनुभव कर रहा हूँ।

वर्तमान समय में जलवायु परिवर्तन एक ऐसी समस्या है जिससे पृथ्वी के समस्त जीवों एवं विशेषकर मात्स्यिकी के लिये एक विकट परिस्थिति उत्पन्न हो गई है। इस आपदा के निराकरण के लिये संस्थान द्वारा मात्स्यिकी और जलकृषि पर जलवायु परिवर्तन के प्रभाव का अध्ययन किया गया है। अध्ययन से पता चला कि गर्म प्रदेशों में वास करने वाली मत्स्य प्रजातियों का शीत क्षेत्रों में विस्थापन हुआ है। पश्चिम बंगाल और ओडिशा की हैचरियों में मछलियों की परिवक्वता निर्धारित समय से पहले हो रही है जिससे प्रजनन काल में भी परिवर्तन देखा गया है। साथ ही यह देखा गया कि दक्षिण 24 परगना जिले के लगभग 11 प्रतिशत क्षेत्र ऐसे हैं जो समुद्री तूफानों के दौरान जलस्तर के 1–2 मी. बढ़ने से इसकी चपेट में आ जाते हैं।

सुन्दरवन को इसकी जैवविविधता के लिये एक धरोहर के रूप में घोषित किया गया है। इस मैंग्रोव में उपलब्ध विभिन्न मत्स्य प्रजातियों के अध्ययन से पता चला है कि इसमें लगभग 215 मत्स्य प्रजातियाँ उपलब्ध हैं। संस्थान ने अरूणाचल प्रदेश के नीमाजांग चू नदी, जिस पर एक नई जलविद्युत परियोजना की स्थापना की गई है, की पारिस्थतिकी एवं मत्स्य जैव विविधता के संरक्षण के लिये पर्यावरणीय प्रवाह का अध्ययन किया है। अध्ययन के बाद संस्थान ने यह सुझाव दिया है कि बराज की पारिस्थितिकी को बचाये रखने के लिये न्यूनतम जल का प्रवाह 3.5 cumsec होना चाहिये।

सस्थान ने ब्रह्मपुत्र नदी की कुछ देशज मत्स्य प्रजातियों में उपलब्ध पोषक तत्वों का अध्ययन किया है और यह परिणाम प्राप्त हुआ है कि इन प्रजातियों मे प्रोटीन, खनिज तत्व और वसा भरपूर मात्रा में उपलब्ध हैं। भारतीय मेजर कार्प प्रजाति, कतला की मांसपेशियों के प्रोटियोम मैप बनाया गया जो जलकृषि की दृष्टि से हमारे देश में उपलब्ध प्रथम वैध सूचना है। संस्थान द्वारा विकसित पेन पालन प्रणाली का असम के जिलों में सफल प्रयोग किया गया क्योंकि किसी भी तकनीक का सफल प्रयोग ही उसकी प्रामाणिकता का द्योतक है।

रिपोर्ट अवधि के दौरान संस्थान के वैज्ञानिकों द्वारा अनेकों शोध पत्र व बुक चैप्टर तथा 5 बुलेटिन (4 अंग्रेजी में और 1 हिन्दी में) का प्रकाशन किया गया।

संस्थान में कुछ महत्वपूर्ण बैठकों का सफल आयोजन किया गया – भारत सरकार की 12वीं पंचवर्षीय योजना संबंधी 2 बैठकें, अनुसंधान सलाहकार समिति बैठक एवं संस्थान अनुसंधान समिति बैठक, आदि। संस्थान में इस रिपोर्ट अवधि के दौरान गणतन्त्रता दिवस, संस्थान का संस्थापना दिवस और गुरूदेव रविन्द्रनाथ टैगोर की 150 वीं वर्षगाठ को अत्यंत ही हर्ष एवं उल्लास के साथ मनाया गया। इसके गुवाहाटी केन्द्र द्वारा "सस्टेनेबल फिशरीज डेवेलपमेन्ट इन बील्स" विषय पर असम मत्स्य विकास निगम, गुवाहाटी के साथ मिलकर एक संगोष्ठी का आयोजन किया। संस्थान के विजन 2030 के प्रलेख संबंधी आयोजित कार्यशाला में अंतर्स्थलीय मात्स्यिकी से जुड़े भागीदारों ने भाग लिया। सभी कार्यक्रम सफल रूप से संचालित हुये और सहभागियों ने इनको बहुत ही सराहा है।

रिपोर्ट अवधि के दौरान संस्थान एवं इसके केन्द्रों में मत्स्य अधिकारियों, मत्स्य पालकों एवं मछुआरों और भा. कृ. अनु. परिषद् एवं अन्य संस्थाओं से नामित सदस्यों के लिये कुल 12 प्रशिक्षण कार्यक्रम और 10 जन जागरूक कार्यक्रम आयोजित किये गये। देश के विभिन्न भागों में आयोजित प्रदर्शनियों में संस्थान द्वारा विकसित तकनीकों और इसकी उपलब्धियों को दिखाया गया। अखिल भारतीय कृषि विज्ञान मेले में संस्थान को सराहना पुरस्कार दिया गया है। संस्थान के कुछ वैज्ञानिकों को पीएच. डी. की डिग्री प्रदान की गई है।

इस दौरान कुछ अधिकारियों एवं कर्मचारियों का संस्थान के केन्द्रों/अन्य संस्थानों में स्थानांतरण हुआ तो 7 नये वैज्ञानिकों और 1 वरिष्ठ वित्त व लेखा अधिकारी की नियुक्ति हुई है, मैं संस्थान के इन नये सदस्यों को बधाई देता हूँ। साथ ही, इस दौरान सेवानिवृत्त हुये अधिकारियों एवं कर्मचारियों के स्वस्थ एवं खुशहाल जीवन के लिये शुभकामनायें देता हूँ ।

मैं संस्थान के समस्त सदस्यों के इस महान संस्थान के विकास में सहयोग और योगदान की सराहना करता हूँ और यह आशा करता हूँ कि वे भविष्य में अपने इस प्रयास में और भी अधिक सफल हों।

इस न्यूजलेटर को और भी अधिक प्रभावी व आकर्षक बनाने एवं सुधार के लिये आपके सुझाव सादर आमंत्रित हैं।

बैरकपुर, जनवरी 2012

(अनिल प्रकाश शर्मा)

अनुसंधान उपलब्धियाँ

सुन्दरवन के मत्स्य समुदाय

सुन्दरवन ज्वारनदमुख विश्व का सबसे विशाल डेल्टाई मैंग्रोव है। यह अपने आप में एक अनूठा मैंग्रोव है जिसमें विश्व के प्राणी और पादप समूह की इतनी अधिक एवं भिन्न–भिन्न प्रजातियां उपलब्ध हैं कि इसे एक धरोहर के रूप में घोषित किया गया है। सुन्दरवन क्षेत्र के पुनरूद्धार के लिये विभिन्न सर्वेक्षण दल, टाइगर रिजर्व संस्था एवं अन्य दो वन्यजीव अभ्यारण्य ने इसकी मात्स्यिकी का विस्तृत रूप से अध्ययन किया है। इस क्षेत्र की मत्स्य संपदा के आंकलन के लिये PRIMER सॉफ्टवेयर (version 6) की सहायता से उपलब्ध 215 प्रजाति (158 जेनेरा, 63 वर्ग एवं 16 आर्डर) संबंधी मात्स्यिकी आंकड़ों का विश्लेषण किया गया। इससे पता चला कि कुल प्राप्त उपज में *Escualosa thoracata* लगभग 42 प्रतिशत, *Harpadon nehereus* 14 प्रतिशत और *Otolithoides pama* व *Stolephorus indicus* 5 प्रतिशत मात्रा में उपलब्ध हैं। विभिन्न समूहों के अध्ययन से पता चला है कि हुगली एवं ठाकुरान–मातला क्षेत्र के मत्स्य प्रजातियों की उपलब्धता में बहुत अधिक अंतर है। यह फरक्का बराज से होने वाले मीठाजल के अधिक प्रवाह के द्वारा निश्चिन्तपुर और काकद्वीप में मानसून के समय जल की लवणता घट जाने के कारण होता है।

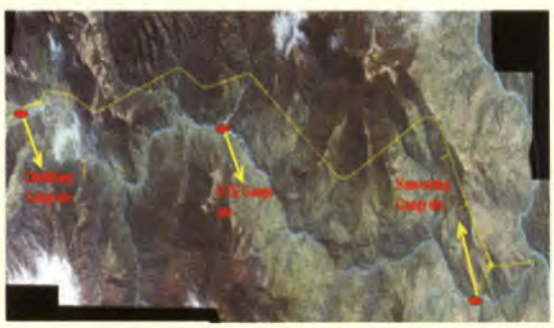
सी एम रोशिथ, आर के मन्ना एवं उत्पल भौमिक

अरूणाचल प्रदेश की नीमाजांग चू नदी की पारिस्थितिकी एवं मत्स्य जैव विविधता के संरक्षण के लिये पर्यावरणीय प्रवाह का अध्ययन

किसी भी नदी की पारिस्थितिकी एवं मत्स्य संपदा बनाये रखने के लिये जलीय प्रवाह का पर्याप्त मात्रा में होना अति आवश्यक है, विशेषकर बांधों पर बनी जलविद्युत परियोजनाओं के लिये। इसी को ध्यान में रख कर संस्थान द्वारा अरूणाचल प्रदेश के नीमाजांग चू नदी की पारिस्थितिकी एवं मत्स्य जैव विविधता के संरक्षण के लिये पर्यावरणीय प्रवाह का अध्ययन किया गया। संस्थान ने इस नदी पर स्थापित नई जलविद्युत परियोजना का अध्ययन एक वर्ष तक किया। यह परियोजना जिमीथांग और कुम्बा के बीच स्थित है। प्रवाहों का मुड़ाव जिमीथांग के निकट है और इस बांध का पावरहाउस नीमाजांग चू और तवांग चू नदियों के संगम पर स्थित है जो बराज क्षेत्र से लगभग 25 कि.मी. दूर है। बराज की प्रस्तावित लंबाई 174.50 मी. और अधिकतम ऊंचाई 10.20 मी. रखी गई है।

संस्थान द्वारा इस नदी के जल की गुणवत्ता एवं मत्स्य प्रजातियों के आंकलन के लिये इसके जैविक व रसायनिक प्राचलों और मत्स्य प्रजाति विविधता का अध्ययन Tennant, Huges & Munster और Building Block प्रणालियों की सहायता से किया गया। इस अध्ययन से यह तथ्य सामने आया कि निम्नतम 3.5 क्युसेक जल का प्रवाह अपेक्षित प्रवाह की गहराई एवं इसके वेग के लिये आवश्यक है क्योंकि इससे नीमाजांग चू जैसी नदी में जलधारण क्षेत्र (10.29 वर्ग मी.) का निर्माण होगा (गहराई – 0.55 मी. और चौड़ाई – 18.71 मी.)। इससे इस नदी की मत्स्य प्रजातियों की संपोषण में सहायता होगी।

ए के साहू, उत्पल भौमिक, बी के भट्टाचार्य, डी देव देबनाथ एवं ए पी शर्मा

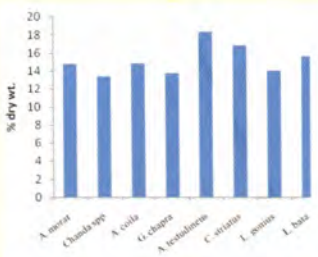


ब्रह्मपुत्र नदी की कुछ चयनित देशज प्रजातियों की पोषकता का आंकलन

ब्रह्मपुत्र नदी की छोटी एवं मध्यम आकार वाली मछलियों को प्रमुख रूप से खाया जाता है। अतः संस्थान ने कुछ चयनित देशज प्रजातियों में उपलब्ध पोषक तत्वों का आंकलन किया। इसके लिये गुवाहाटी के उजानबाजार से *Aspidoparia morar*, *Chanda* spp, *Ailia coila*, *Gudusia chapra*, *Anabas testudineus*, *Channa striatus*, *Labeo gonius* और *Labeo bata* के नमूनों को संग्रहण किया गया। इन प्रजातियों में *Anabas testudineus* में प्रोटीन अधिक होता है (0. 01 से अधिक जिसमें से सूखी प्रोटीन 18.38 प्रतिशत होती है), लिपिड (12.48 प्रतिशत) एवं ash की मात्रा (12.48 प्रतिशत) पायी गयी। इसी प्रकार *C. striatus* में अन्य प्रजातियों की तुलना में प्रोटीन की मात्रा अधिक थी। *A. morar*, *Chanda* spp एवं *A. coila* के प्रोक्सिमेट संघटन का तुलनात्मक अध्ययन किया गया। इसमें यह देखा गया कि इन तीनों प्रजातियों में आकार के अनुसार इनमें आर्द्रता एवं लिपिड की मात्रा में भिन्नता पाई गई अर्थात् बड़ी आकार वाली मछलियों में तुलनात्मक रूप से आर्द्रता की मात्रा कम पर लिपिड अधिक पायी गयी। इसी प्रकार इन तीनों प्रजातियों में प्रोटीन की मात्रा लगभग समान ही थी, केवल *A. coila* प्रजाति में बड़ी आकार की मछलियों में प्रोटीन की मात्रा अधिक थी। अतः यह कहा जा सकता है कि छोटी आकार वाली मछलियों में पोषक गुण अधिक होते हैं : अशोधित प्रोटीन – 11 से 19 प्रतिशत, उत्तम गुणवत्ता वाले वसा – 2.33 से 12.5 प्रतिशत, खनिज तत्व – 2.18 से 8.03 प्रतिशत।

पर इन सबके अलावा भी इन मछलियों के स्वाद के लिये उत्तरदायी तत्वों जैसे मुक्त अमीनो एसिड, मुक्त फैटी एसिड, नाइट्रोजन आदि का आंकलन एवं विश्लेषण आवश्यक है।

डी देवनाथ, सोना येंगकोकपम, बी के भट्टाचार्य, के के शर्मा, पी गोगोई एवं ए ककाती



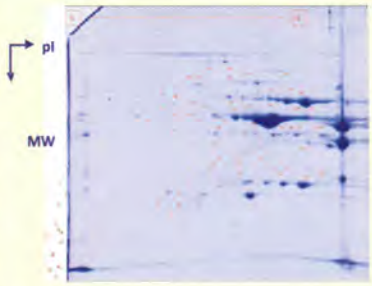
संस्थान द्वारा विकसित पेन पालन तकनीक का असम के सोनितपुर जिले में प्रयोग

संस्थान द्वारा पेन पालन तकनीक का विकास किया गया है जिसमें स्थानीय तौर पर कम मूल्य पर प्राप्त वस्तुओं से बने पेन में कार्प मछलियों के जीरों को पालन किया जाता है। वर्ष 1996–98 से इस पालन का प्रयोग किया जा रहा है और वर्ष 2000–04 में इससे अच्छे परिणाम प्राप्त हुये। इस तकनीक को असम के सोनितपुर जिले के दो स्वयंसेवी (रंगापाणी बील आत्मसहायक गोथ और नयनज्योति) और एक गैर–सरकारी संस्था द्वारा उपयोग में लाया गया है। रंगापाणी बील आत्मसहायक गोथ ने रंगापाणी बील में बड़ी कार्प मछलियों के पालन हेतु इस प्रणाली का उपयोग किया है। वर्ष 2008–09 में महात्मा गांधी राष्ट्रीय ग्रामीण रोजगार योजना (MNREGS) के अंतर्गत 0.24 हे. वाले दो जल क्षेत्रों में 1,30,844 रूपये की लागत से बील स्थापित किये गये। इस प्रयास में सोनितपुर के जिला मात्स्यिकी कार्यालय द्वारा संस्थान के प्रौद्योगिकी संबंधी दिशानिर्देशों पर आधारित तकनीकी सहायता दी गई। रंगापाणी बील आत्मसहायक गोथ द्वारा कतला, रोहू, मृगल, सिल्वर कार्प, कॉमन कार्प और ग्रास कार्प के जीरों का (6000 जीरे प्रति हे. की दर से) पालन किया गया और इससे मत्स्य उत्पादन 2400 कि.ग्रा प्रति हे. की दर से प्राप्त हुई। बालीपाड़ा ब्लॉक के परमाइगुली ग्राम के नयनज्योति स्वंयसेवी संस्था द्वारा अप्रैल 2010 में रंगापाणी बील में पेन पालन किया गया। इसका कुल लागत मूल्य (बील संरचना का निर्माण एवं स्थापना, बीज और मछलियों के लिये भोजन आदि) 1,60,000 रूपये था जिसका 85 प्रतिशत भाग मात्स्यिकी विभाग द्वारा वहन किया गया। वर्ष 2009–10 में गैर–सरकारी संस्था, मांडल द्वारा सोनितपुर जिले के चिलोनी ग्राम के काचु बील में 1.35 हे. जलक्षेत्र में 3,73,950 रूपये लागत पर पेन पालन किया गया जो बहुत ही सफल रहा।

बी के भट्टाचार्य, डी देवनाथ, सोना येंगकोकपम, के के शर्मा, पी गोगोई एवं वी कोलेकर

भारतीय मेजर कार्प मछलियों को प्राटियोमिक्स का अध्ययन

हमारे देश में मछलियों के जीनोम और प्राटियोमिक्स संबंधी सूचनाओं का अभाव है। मास स्पेक्ट्रोमेट्री द्वारा पेप्टाइड के परीक्षण संबंधी सूचनाओं में तकनीकी विकास से उत्तकीय प्रोटीन की पहचान के लिये नई प्रणालियों की खोज की गई है जो बहुत ही सहायक सिद्ध हुई हैं। मछलियों के शरीर की संरचना में मांसपेशियों की प्रधान भूमिका है। ऐसी बहुत सी मत्स्य प्रजातियां हैं जिन्हें मछलियों की मांसपेशियों को समझने, उनमें होने वाले आणविक परिवर्तनों को जानने के लिये परीक्षण के लिये उपयोग किया जा सकता है। संस्थान द्वारा कतला की मासंपंशियों के प्रोटियोम का



अध्ययन किया गया। कुल 60 प्रतिशत प्राटियोम की पहचान की गई – 2-D GE, immunoblotting, MALDI-TOF-MS और LC-MS-MS। प्रोटीन स्पॉन जिनकी पहचान की गई, वे हैं – glyceraldehyde-3-phosphate dehydrogenase, creatine kinase M1, creatine kinase M2, phosphoglycerate kinase, phosphoglucomutase, apolipoprotein, enolase, aldolase A, -actin, glutamic-oxaloacetic transaminase, pyruvate kinase, -1 antitrypsin, phosphorylase, triosephosphate isomerase, lactate dehydrogenase, transferrin variant F, zgc protein, novel protein similar to vertebrae desmoplakin (DSP), novel protein similar to vertebrae Rho guanine nucleotide exchange। उपर्युक्त सूचनायें प्रोटियोम के इतिहास में प्रथम बार विकसित की गईं। ये सूचनायें भविष्य में कतला एवं अन्य प्रजातियों के प्रोटियो–जीनोम संबंधी सूचना प्राप्त करने और जैव प्रौद्योगिकी परीक्षणों में बहुत सहायक सिद्ध होने की आशा है। इन परीक्षणों से मछलियों की स्वास्थ्य वृद्धि एवं इनमें होने वाली बीमारियों की रोकथाम में सहायता होगी। साथ ही इन प्रजातियों के सत्यापन की जांच और इन्हें वर्गीकृत करने संबंधी अंतर्राष्ट्रीय दिशानिर्देशों की प्राप्ति होगी जिससे मछलियों की गुणवत्ता में सुधार और इनके उत्पादन में वृद्धि होगी।

बी पी मोहान्ति एवं ए पी शर्मा

भारत में जलवायु परिवर्तव का मात्स्यिकी पर प्रभाव

संस्थान द्वारा अंतर्स्थलीय मात्स्यिकी पर जलवायु परिवर्तन के प्रभाव का अध्ययन किया गया जिससे निम्नलिखित परिणाम प्राप्त किये गये –

गंगा नदी एवं इसके मैदानी क्षेत्रों से संबंधित गत् 30 वर्षों में हुये वर्षापात, तापमान और मत्स्य प्रजाति विविधता आंकड़ों से यह तथ्य सामने आया कि गर्म प्रदेशों में रहने वाली कुछ मत्स्य प्रजातियों जैसे *G. giuris, P. ticto, X. cancila, M. vittatus* और *Catla catla* अब हरिद्वार के शीत क्षेत्रों में पाई जाती हैं जहाँ जल के औसत तापमान में 1.6° से. ग्रे. की वृद्धि हुई है। इसी प्रकार शीत प्रदेशों में पाये जाने वाले कुछ पादपप्लवक जैसे, *Amphicampus, Tetracycles, Diatoma* एवं *Ceratoneus* की उपलब्धता गंगा नदी के ठंडे क्षेत्रों में तापमान बढ़ने के कारण कम हो रही है।

मीठाजल क्षेत्रों में तापमान वृद्धि और वर्षापात में परिवर्तन के कारण भारतीय मेजर कार्प प्रजातियों का अंडजनन प्रभावित हुआ है। इसके कारण गत् दो दशकों से पश्चिम बंगाल और ओडिशा की हैचरियों में पालित मछलियों की परिपक्वता समय से पहले होने के कारण प्रजनन काल में भी परिवर्तन हो रहा है। पिछले दशकों में

प्रजनन अवधि में 45–60 दिनों की और प्रजनन काल में 110–120 से 160–170 दिनों की वृद्धि को देखा गया।

इस जलवायु परिवर्तन से अंतर्स्थलीय मात्स्यिकी पर सूखा और बाढ़ जैसी प्राकृतिक आपदाओं के प्रभाव का अध्ययन किया गया है। इससे यह तथ्य सामने आये कि वर्ष 2009–10 में पश्चिम बंगाल के जिलों में मार्च से सितम्बर महीनों के बीच वर्षापात कम होने से (उत्तर 24 परगना– 20 प्रतिशत, बांकुड़ा– 27 प्रतिशत, बर्दवान– 23 प्रतिशत और हुगली– 34 प्रतिशत) सूखे जैसी स्थिति का सामना करना पड़ा। इससे मत्स्य प्रजनन और मत्स्य पालन भी प्रभावित हुआ है। गत् 4 वर्षों की तुलना में इस वर्ष उत्तर 24 परगना और बांकुड़ा जिलों में क्रमशः 61 एवं 73 प्रतिशत मत्स्य बीज नष्ट हो गये। अतः 80 प्रतिशत हैचरियों में, जिनमें भारतीय मेजर कार्प प्रजातियों का पालन किया जाता था, उनमें अन्य प्रजातियों जैसे, Pangasius (*Pangasius sutchi)*, *Puntius javanicus* और *C. garipenus* को पाला जाने लगा क्योंकि ये प्रजातियाँ अधिक पर्यावरणीय दाब और अधिक तापमान में भी जीवित रहती हैं।

पश्चिम बंगाल में 'आइला' जैसे समुद्री तूफान के प्रभाव से बचाव के लिये दक्षिण 24 परगना जिले में डिजीटल एलिवेशन मॉडेल (DEM) की स्थापना की गई है। इससे यह आंकलन किया गया कि समुद्री जल के 1 मी. उपर उठने से 3 प्रतिशत स्थल क्षेत्र जलमग्न होते हैं पर अगर यह जल 2 मी. बढ़े तो यह कृषि क्षेत्र एवं जलकृषि पोखरों को प्रभावित करता है। अध्ययन से यह देखा गया कि दक्षिण 24 परगना जिले के लगभग 11 प्रतिशत क्षेत्र समुद्री तूफानों के दौरान जलस्तर के 1–2 मी. बढ़ने से इनकी चपेट में आ जाते हैं।

एम के दास, पी के साहा, एस के साहु, पी के श्रीवास्तव एवं एस दे

OBITUARY

Dr. P. V. Dehadrai
(1938-2011)

Born on 21st December 1938, **Dr. Padmakar Vishwanath Dehadrai** persued research in physiology and endocrinology of fishes at Delhi University for Ph.D degree in 1961. He moved to Canada to join St. Andrews University to persue Post Doctoral research during 1963-66 on respiratory physiology of salmon, pathological biochemistry of cod and fishing in North Sea under National Research Council of Canada.

He was Scientist B at National Institute of Oceanography and played significant role in the establishment of NIO as founder scientist. His findings related to chlorophyll based estimation of primary productivity got wide appreciation and application.

Dr. Dehadrai joined CIFRI (ICAR) in May 1971 as Scientist S-3 and Project Coordinator of "All India Coordinated Research Project on Air-breathing Fish Culture" and did outstanding work on swamp ecology of Bihar, Assam and several other states of India, which led to the development of air-breathing fish culture technology.

In November 1981 Dr. Dehadrai joined as the first Fisheries Development Commissioner (FDC) under the Ministry of Agriculture, New Delhi. During his five year term he was instrumental in speeding up the overall development of fisheries sector in the country - both marine and inland fisheries.

After completing his five year term as Fisheries Development Commissioner, Dr. Dehadrai came back to ICAR as Assistant Director General (Fisheries) and worked for about one year. He became the first DDG (Fisheries) and completed two successful terms of five years each. It was during his tenure that fisheries sector got prominence. Four new fisheries institutes (CIFA, CIBA, NBFGR and NCCWFR) were created and fully established and CIFE acquired the status of Deemed University. A major thrust was given to fisheries and aquaculture research in the country under his able leadership. He was instrumental in promoting research in several emerging areas such as aquatic animal health, genetics, fish nutrition and bioenergetics,biotechnology, aquatic environment and nutrient dynamics, aquaculture engineering, *etc.* Just before his superannuation in 1998, Dr. Dehadrai also worked as OSD as Head, Directorate of Publication and Information of ICAR. After his retirement he was Consultant for World Bank and other projects and kept supporting ICAR and other scientific agencies in the capacity of Chairman/member of various advisory and expert committees.

Dr. Dehadrai was awarded Fellowships of highly acclaimed National and International professional Societies and Associations like Zoological Society of India (FZSI), Fellow of Zoological Society of London (FZSL), Fellow-National Academy of Sciences, India (FNASc), Fellow-National Academy of Agricultural Sciences, India (FNAAS), Fellow, Inland Fisheries Society of India (FIFSI) *etc.* Besides, he was also recipient of several awards and honour including Rafi Ahmed Kidwai Memorial Prize of ICAR, INDIAQUA award of MPEDA, Ministry of Commerce, Govt. of India. He was also awarded Honorary D.Sc. by CIFE.

He departed for his heavenly abode on 2nd June, 2011. He is survived by his wife, two sons, two daughter in-laws and five grand children.

Dr. Dehadrai was a versatile genius, an excellent communicator with equally good command over fisheries and aquaculture research and development. He was an institution builder, great visionary and an illustrious Team Leader. He was simple, kind hearted, lively and ever accessible to all. With his demise the Asian Region and the country have lost a great fishery scientist and his colleagues have lost their well wisher.

Dr. Dehadrai was one of the stalwarts in inland fisheries research and development and will be ever remembered by all the stakeholders of Indian Fisheries for the cause of his noble contribution in growth and prosperity of the fisher community.