

## RESEARCH HIGHLIGHTS

### DNA barcoding

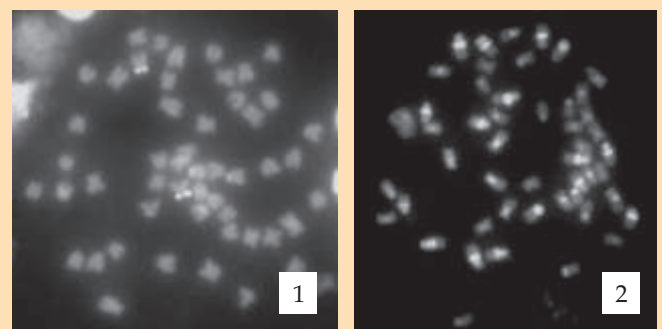
A comprehensive DNA barcoding programme for indigenous fish species has been initiated at NBFGR, for the first time in South and South East Asia. Presently, 1300 marine fish samples, covering 300 species, have been collected from Mumbai, Cochin, Vishakhapatnam, Mandapam, Andaman and Nicobar Islands. The total DNA was isolated and PCR amplification done for 700 samples, covering 150 species. DNA sequencing was done in 350 samples, covering 100 species. DNA barcodes have been prepared for 70 species. The voucher specimens of all marine fishes collected are maintained at the National Fish Museum of NBFGR, Lucknow.



DNA barcode (655bp mCOI fragment) of *Scatophagus argus*

### Cytogenetic characterization of two prioritized species from Manipur

A cytogenetic study was completed in two species collected from Manipur namely, *Osteobrama belangeri* (Valenciennes, 1844) and *Colia fasciatus* (Bloch & Schneider, 1801), locally known as Pengha and Ngapemma, respectively, using Ag-NOR, CMA3 staining and C-banding. *O. belangeri* possessed a diploid chromosome number of 50 whereas, *C. fasciatus* was found to possess diploid chromosome number of 48. The Ag-NORs were found to be localized on one pair of sub-metacentric chromosome in both the species, whereas, the NORs were found on one pair of sub-metacentric chromosome in *O. belangeri* and on four pairs in *C. fasciatus*, using CMA3 staining. The C-bands were found on a number of chromosomes in both the species.



Metaphase of chromosomes showing (1) CMA<sub>3</sub> stained NORs of *Osteobrama belangeri*, (2) C-bands in *C. fasciatus*.

### **Polymorphic microsatellite markers in lobsters**

Lobsters are one of the most valuable and highly priced sea foods. Heavy demand and attractive price for lobsters in the international market have resulted in increased exploitation of lobsters in recent years. Although the lobster fauna of commercial fishing grounds comprises fourteen species of littoral and six species of deep-sea forms, only four littoral and one deep-sea form contribute to commercial fishery viz., *Panulirus homarus*, *P. polyphagus*, *P. versicolor*, *P. ornatus*, *Thenus orientalis* and *Puerulus sewelli*. In the shallow water *P. homarus* and *Thenus orientalis* are the most dominant species and are widely distributed all along the Indian coast. A study was initiated to study the genetic stock structure of these two species. A total of 21 polymorphic microsatellite markers were identified in the lobster, *P. homarus* and *Thenus orientalis* by cross-priming from other species. These markers are being used in the population genetic studies of these species.

### **Genotoxic effects of Chlorpyrifos in fish**

Comet assay was used to assess genotoxic effects of organophosphorus pesticide, Chlorpyrifos, using fresh water murrel *Ophicephalus punctatus* as a model fish. Initially, the 96-h LC50 value was determined as 811.98 ppb,

indicating Chlorpyrifos to be highly toxic to fishes. Its presence in water bodies can pose a threat to the aquatic fauna. Analysis of the DNA damage in terms of tail length and percentage of tail DNA indicated chlorpyrifos to be genotoxic. The gill tissues were found to be more sensitive than lymphocytes as it showed higher DNA damage.

### **Successful larval rearing of endangered *Chitala chitala* in a recirculatory system**

*Chitala chitala* (Hamilton) is one of the endangered freshwater fish species in India for which the development of controlled larval rearing procedure could be very useful for stock enhancement. The study revealed that specific growth rate (SGR) was higher in post hatchlings fed on live tubifex worms ( $2.40 \pm 0.72$ ) followed by fish eggs ( $2.15 \pm 0.71$ ). Highly significant difference ( $p < 0.01$ ) in SGR was observed in fish fed on live feed, dry tubifex and fish eggs. Highest mean survival rate was observed in live tubifex (94%) and chironomous larvae (92%). The post hatchling reared with spirulina and daphnia showed same survival rate of 88%. Experiments showed that captive bred post hatchlings of *C. chitala* could be reared in experimental recirculatory system for attaining higher growth and survival. This is the first report on the successful larval rearing of captive bred population of *C. chitala* under captivity.

## **HUMAN RESOURCE DEVELOPMENT**

### **Training on Basic Tools in Molecular Biology Research**

The NBFGR organized a training programme on “Basic Tools in Molecular Biology Research” during February 5-9, 2007. The participants were exposed to the baseline theoretical, as well as, practical insights in various types of tools used in molecular biology research. The training included DNA extraction from different tissues, restriction digestion of DNA, polymerase chain reaction, DNA sequencing, etc. A total of 9 participants

belonging to different research organizations/ universities/ national institutes of India, participated in the programme.

### **Training on Genotoxicity Biomarkers in Fishes**

A training programme on “Genotoxicity Biomarkers in Fishes “ was organized during February 15-21, 2007. Dr. D.P Singh, Dean and Head, Department of Environmental Science, BBA Central University, Lucknow inaugurated the programme. The participants were given hands on

training on chromosomal aberration test, sister chromatid exchanges, micronuclei detection, and the single cell gel electrophoresis or comet assay for genotoxicity assessment in aquatic organisms including fishes. Invited lectures from eminent scientists of premier organizations/ universities were also organized during the training. A total of 20 participants from different research organizations/ universities/ national institutes of the country participated in this course.

### **Training on DNA Marker Technologies: Principles and Applications at NBFGR Cochin Unit, Kochi**

A training programme on “DNA Marker Technologies: Principles and Applications” was organized at NBFGR Cochin Unit during February 21- March 03, 2007. Altogether 21 participants from various universities, research institutes, colleges and fish processing industry attended the course. The training was aimed to impart theoretical and practical knowledge on various classes of DNA based markers and on the recent developments in the field, with an ultimate goal to develop trained manpower in the field of DNA fingerprinting. The training programme was inaugurated by Mr. G. Mohan Kumar, I.A.S., Chairman, Marine Products Export Development Authority, Kochi whereas Prof. (Dr.) Mohan Joseph Modayil, Director, CMFRI, Cochin presided over the function. In the valedictory function, the Chief Guest, Dr. K. Gopakumar, Vice Chancellor, IFCR - York College, Toronto, Canada



The training programme at NBFGR Cochin Unit

and Former Deputy Director General (Fisheries), ICAR, New Delhi distributed certificates to the participants.

### **Training on Fish Disease Reporting System for State Fisheries Officers**

The Institute organized a training programme on “Fish Disease Reporting System”, sponsored by DAHDF, Ministry of Agriculture, Govt. of India, for State Fisheries Officers during March 7-9, 2007. A total number of 21 fisheries officers from ten states participated in this training programme. Dr. P.V. Dehadrai, former DDG (Fy.), ICAR, New Delhi inaugurated the programme. The main objective of this training was to create awareness among state fisheries officers on OIE and NACA listed diseases. The training focused on level one diagnosis, collection and dispatch of samples and familiarization with modern disease diagnostic techniques. Besides the internal resource persons, leading experts from other institutions gave a series of invited lectures during the training. Shri. M. Dwivedi, Special Secretary, U.P State Fisheries was the Chief Guest of the Valedictory function whereas, Smt. Anita Mishra, Director, U.P State Fisheries was the Guest of Honour.

### **Training on "Molecular Markers and Genetic Diversity Analysis"**

A training programme on “Molecular Markers and Genetic Diversity Analysis” was conducted from March 12-21, 2007. A total number of 18 participants representing leading national



Chief Guest Dr. S.P.S. Ahlawat, Director, IVRI, Izatnagar, Bareilly releasing the Training Manual on Molecular Markers

institutes and universities of 11 states of the country participated in the programme. The training course was inaugurated by Dr. S.P.S. Ahlawat, Director, IVRI, Izatnagar, Bareilly UP. The participants were given hands on training on

molecular techniques such as DNA isolation, genomic library construction, RAPD, allozymes, microsatellites, genotyping, mitochondrial haplotyping, sequencing and statistical tools for genetic diversity analysis.

## IMPORTANT MEETINGS ORGANIZED

### Research Advisory Committee Meeting

The Research Advisory Committee meeting of NBFGR was organized during Feb. 09-10, 2007 under the chairmanship of Dr. E.G Silas, Former Vice-Chancellor, Kerala Agricultural University.



RAC meeting in progress



A view of the SRC meeting

### Staff Research Council Meeting

The Annual Staff Research Council meeting of the Institute was organized on March 30-31, 2007 under the chairmanship of Dr. W.S. Lakra, Director, NBFGR.

## LECTURES ORGANIZED

A series of invited guest lectures by following leading experts were organized at the Institute:

- Dr. A.D Diwan, ADG (Marine Fy.) ICAR, New Delhi on "Nano-technology and its applications in fisheries" on February 10, 2007.
- Dr. Yogeshwer Shukla, Scientist E, Industrial Toxicology Research Centre, Lucknow on "Mutagenic and Carcinogenic risk with environmental carcinogens" on February 17, 2007.
- Dr. Neeraj Sinha, Senior Assistant Director, Division of Toxicology, Central Drug Research Institute, Lucknow on "Clinical Cytogenetics" on February 19, 2007.
- Shri Prabodh Kumar Trivedi, Plant Gene Expression Lab, National Botanical Research Institute, Lucknow on "Molecular basis of detoxification of heavy metals by aquatic plants" on February 20, 2007.
- Dr. S.V.S Rana, Professor and Head, Department of Zoology, CCS University, Meerut on "Biomarkers in health and disease" on February 21, 2007.
- Dr. Suraksha Agarwal, Head, Department of Genetics, SGPGI, Lucknow on "Genetic

Diversity in Human Populations" on March 13, 2007.

- Dr. Balvinder Singh, Scientist C, Bioinformatic Centre, Institute of Microbial Technology, Chandigarh on "Bioinformatic Tools in Molecular Genetics" on March 16, 2007.
- Dr. J.L Karihaloo, Project Coordinator, Asia-Pacific Consortium on Agricultural Biotechnology, National Agricultural Science Centre, New Delhi on "Agricultural Biotechnology Research in Asia: Status and Priorities" on March 17, 2007.
- Dr. S.K Jain, Professor, Department of Biotechnology, Faculty of Science, Jamia Hamdard University, New Delhi on "Advances in Functional Genomics" on March 17, 2007.
- Dr. Neeta Sehgal, Reader, Department of Zoology, University of Dehli on "Advances in

Molecular Endocrinology" on March 19, 2007.

- Dr. Rajinder Singh Sagwan, Scientist E, Central Institute of Medicinal and Aromatic Plants, Lucknow on "Genetic Diversity in Medicinal and Aromatic Plants" on March 20, 2007.
- Dr. A.K Singh, Principal Scientist & Head, Germplasm Conservation Divison, National Bureau of Plant Genetic Resources, New Delhi on "Registration of Germplasm and Genetic Stocks: Status and Opportunities" on March 20, 2007.
- Prof. Sandeep Malhotra, Department of Zoology, Allahabad University on "Diseases of aquatic animals: Modern approach to diagnostic and prophylaxis".
- Prof. Nirupama Agarwal, Head, Department of Zoology, Lucknow University on "Parasitic diseases of finfishes in India: Symptoms, diagnosis and treatment".

## LECTURES/TALKS DELIVERED

The following invited lectures/ talks were delivered by the NBFGR scientists at various places:

- Dr. Puyesh Punia, Sr. Scientist delivered a talk on activities and achievements of the Institute in fish biotechnology and conservation on the occasion of National Science Day at CIMAP (CSIR), Lucknow on February 28, 2007.
- Dr. A.K. Singh, Sr. Scientist delivered a talk on "Diversification in fish culture" on the occasion of the National Farmer's Meet organized by Indian Vegetable Research Institute, Varanasi, during January 27-28, 2007.
- Dr. A.K. Singh, Sr. Scientist delivered a guest lecture on "Exotic fish introductions in India: An overview" at the 9<sup>th</sup> Indian Agricultural Scientists and Farmers Congress held at Allahabad during Jan 29-30, 2007.
- Dr. P.K Varshney, Sr. Scientist delivered a lecture on "More crop per drop- in relation to fisheries" on the occasion of National Science Day - 2007 at District Science Club, Lucknow on February 27, 2007.
- Dr. P.K Varshney, Sr. Scientist delivered a lecture on "Integrated fish farming" in a Workshop organized by the UP State Fisheries Department at Lucknow on March 14, 2007.

## PARTICIPATION IN WORKSHOPS /SEMINARS /MEETINGS/ TRAININGS

### Abroad

- Dr. T. Raja Swaminathan, Scientist (SS) attended a FAO/DA- BFAR/ NACA-workshop on “Information requirements for maintaining aquatic animal biosecurity” at Cebu City, Philippines during February 14-18, 2007.

### In India

- Dr. W. S. Lakra, Director attended the 12th meeting of the National Committee on Introduction of Exotic Aquatic Species on January 19, 2007 at DAHDF, MOA, New Delhi.
- Dr. W. S. Lakra, Director attended the Mega Seed Project meeting of ICAR on March 01, 2007 at NASC, New Delhi.
- Dr. W. S. Lakra, Director attended the 6th meeting of the Bioscience sub-group of ICAR-CABI Work Plan Committee, New Delhi on March 08, 2007.
- Dr. U.K Sarkar, Sr. Scientist and Shri A.K. Pathak Scientist (SS) attended a training programme on “Application of remote sensing in agriculture and allied sciences research” at Remote Sensing Application Centre (RSAC), Lucknow during February 19-25, 2007.
- Dr. L.K Tyagi, Scientist (SS) and Hindi Officer attended half-yearly meeting of the *Nagar Rajbhasha Karayawahana Samiti* at Central Drug Research Institute (CSIR), Lucknow on February 26, 2007.
- Dr. U.K. Sarkar, Sr. Scientist attended a Consultation Workshop of the Ministry of Environment and Forest, Animal and Plant Committee for Development of Criteria for inclusion of flora & fauna in the schedules of the Indian Wildlife (Protection) Act, 1972, held at WII, Dehradun, during March 19-20, 2007.
- Shri Gulab Chandra, T-2 attended a training programme on “Supervisory Development” at Foremen Training Institute, Jamshedpur during January 08-12, 2007.

## EXTENSION ACTIVITIES

The Institute participated in the following exhibitions related to fisheries and aquatic resources:

- National Farmer’s Meet organized by Indian Vegetable Research Institute, Varanasi, during January 27-28, 2007 which was inaugurated by Hon’ble Dr. Mangala Rai, Secretary, DARE and Director General, ICAR New Delhi.
- National Science Day exhibition organized by Central Institute of Medicinal & Aromatic Plants (CSIR), Lucknow, on Feb. 28, 2007.
- State level workshop-cum-exhibition on *Samanvit matasya palan* (In Hindi) organized

by Uttar Pradesh State Fisheries Department on March 14, 2007 at Lucknow.

The following batches of students and farmers visited different laboratories and fish farm of the Institute during this period:

- Fifty progressive farmers from Krishi Vigyan Kendra, Ujwa, Delhi on March 01, 2007.
- Eleven trainees of Jammu & Kashmir State Fisheries undergoing training at NBFGR Unit, Chinhat, Lucknow on March 07, 2007.
- Twenty-five students of M.Sc. Zoology along with the faculty members from T.D College, Jaunpur, U.P on March 28, 2007.

## STAFF NEWS

### Welcome

The following persons joined NBFGR on local transfer from CIFE Centre, Chinhat, during the period under report:

- Shri. Amit Singh Bisht
- Shri A.K. Yadav
- Shri. Dus Raj
- Shri S.P. Singh
- Shri. Mahesh Chand
- Shri S.K. Upadhyay
- Shri. Anwar
- Shri Ravi Kumar
- Shri Om Prakash
- Shri S.K. Singh
- Shri Sajivan Lal
- Shri P.C. Jaiswal
- Shri Narayan
- Shri Jogendra Singh
- Shri P.K. Awasthi

- Shri P.C. Verma
- Shri Mohd. Gyas

The NBFGR family welcomes all the new staff members.

### Congratulations !

The following staff members of the Bureau were promoted to the next higher grade:

- Dr. U.K Sarkar, Scientist (SS) to Senior Scientist w.e.f. 30.01.2006.
- Shri Rajeev Singh, Scientist to Scientist (SS) w.e.f. 29.10.2005.
- Dr.T. Raja Swaminathan, Scientist to Scientist (SS) w.e.f. 22.11.2005.
- Shri. M.S Verma, Scientist to Scientist (SS) w.e.f. 05.11.2005.
- Shri. Karan Veer Singh, Scientist to Scientist (SS) w.e.f. 07.02.2006.

The NBFGR family extends hearty congratulations to all the above staff members for their success.

## OTHER ACTIVITIES

### CIFE, Chinhat Centre merged with NBFGR, Lucknow

The assets and farm facilities, along with twenty two staff members of the Chinhat, Lucknow Centre of the Central Institute of Fisheries Education, Mumbai were transferred to the Bureau w.e.f. February 21, 2007.

### Awards / Honours

- Dr. A.K. Singh, Sr. Scientist was honoured with the S. Z. Quasim Medal 2007, by the Bioved Research and Communication Centre, Allahabad at the 9<sup>th</sup> Indian Agricultural Scientists and Farmers Congress during Jan 29-30, 2007.
- The Bureau was awarded an appreciation letter by the *Nagar Rajbhasha Karayanvayan Samiti* for organizing a workshop in Hindi.

Dr. L.K Tyagi, Scientist (SS) and Hindi Officer received this appreciation letter on behalf of the Director and staff of the Institute on February 26, 2007 at Central Drug Research Institute, Lucknow.

### Professional services

- Shri Karan Veer Singh, Scientist (SS) served as an external examiner for B.Tech. (Biotechnology & Bioinformatics) programme of the Uttar Pradesh Technical University, Lucknow in January, 2007.
- Dr. Rehana Abidi, Sr. Scientist served as an external examiner for M.Sc (Molecular Biology) practical exams of the Nehru Biotechnology Centre, Allahabad University on February 5-6, 2007.



Dr. W.S. Lakra, Director addressing the staff on Republic Day

## Republic Day celebrations

- A flag hoisting ceremony was observed on the Republic Day. Dr. W.S. Lakra, Director hoisted the National Flag in the presence of other staff members of the Bureau. On this occasion, a series of sports events were organized for the staff and their family members. Dr. W.S. Lakra, Director distributed prizes to the winners.

## DISTINGUISHED VISITORS

- Dr. N.K. Tyagi, Member, Agricultural Scientist's Recruitment Board, ICAR, New Delhi.
- Dr. P.V. Dehadrai, Former Deputy Director General (Fy.), ICAR, New Delhi.
- Dr. E.G. Silas, Former Vice-Chancellor, Kerala Agricultural University and Former Director, CMFRI, Cochin.
- Prof. H.R. Singh, Former Vice-Chancellor, Allahabad University, Allahabad.
- Dr. S.P.S. Ahalawat, Director, Indian Veterinary Research Institute, Izatnagar, Barielly.
- Dr. A.D. Diwan, Assistant Director General (Marine Fy.) ICAR, New Delhi.
- Dr. B.C. Panda, Former Professor and Head, Biophysics Division, IARI, New Delhi
- Prof. T.R. Rao, Former Director, School of



Dr. N.K. Tyagi, Member, Agricultural Scientist's Recruitment Board, ICAR, New Delhi visiting laboratories of the Institute

Environmental Sciences, Delhi University, Delhi.

- Dr. Dilip Kumar, Vice-Chancellor and Director, Central Institute of Fisheries Education, Mumbai.
  - Dr. B.N. Pandey, Bhabha Atomic Research Centre, Mumbai.
  - Dr. D.P. Singh, Dean and Head of the Department, Environmental Science, BBR Ambedkar University, Lucknow.
  - Dr. George John, Advisor, Department of Biotechnology, Govt. of India, New Delhi.
  - Shri G. Mohan Kumar, Chairman, Marine Products Export Development Authority, Kochi. #
  - Prof. Mohan Joseph Modayil, Director, CMFRI, Cochin. #
  - Dr. K. Gopakumar, Vice Chancellor, IFCR – York College, Toronto, Canada & Former Deputy Director General (Fisheries), ICAR, New Delhi. #
  - Shri M. Dwivedi, Special Secretary, Fisheries, Govt. of U.P. Lucknow.
  - Smt. Anita Mishra, Director, Uttar Pradesh State Fisheries Department, Lucknow..
  - Dr. G. Choudhary, Professor and Head, Department of Gastroenterology, Sanjay Gandhi Post Graduate Institute, Lucknow.
  - Prof. Sandeep Malhotra, Department of Zoology, Allahabad University, Allahabad.
  - Prof. Nirupama Agarwal, Head, Department of Zoology, Lucknow University.
- # Visited only NBFGR Cochin Unit.



## अनुसंधान समाचार

### डीएनए बारकोडिंग :

संस्थान में भारतीय मछलियों की डीएनए बारकोडिंग पर एक विस्तृत कार्यक्रम आरम्भ किया गया है। दक्षिण एवं दक्षिणी-पूर्वी एशिया में पहली बार इस तरह का कार्यक्रम आरम्भ किया गया है। अभी तक 300 समुद्री प्रजातियों के 1300 नमूने एकत्र किए गए हैं। कुल 150 प्रजातियों के 700 नमूनों से डीएनए पृथक किया गया, 100 प्रजातियों के 350 नमूनों की डीएनए सीक्वेंसिंग की गई तथा 70 प्रजातियों की डीएनए बारकोडिंग की जा चुकी है। सभी समुद्री प्रजातियों के वाउचर स्पेसीमेन्स भी ब्यूरो के राष्ट्रीय मत्स्य संग्रहालय में एकत्र किए जा रहे हैं।

### मणिपुर की दो प्राथमिकता प्राप्त प्रजातियों का चरित्र-चित्रण

मणिपुर से एकत्र की गई दो प्राथमिकता-प्राप्त प्रजातियों, *ऑस्टिओब्रामा बेलागेंरी* तथा *कोलिआ फासिएटस* का, एजी-एनओआर, सी एम ए 3 स्टेनिंग तथा सी-बैन्डिंग द्वारा कोशिकानुवांशिकी चरित्र-चित्रण किया गया। *ऑस्टिओब्रामा बेलागिरी* में डिप्लायड क्रोमोसोम संख्या 50 थी जबकि *कोलिआफासिएटस* में यह संख्या 48 थी। दोनों प्रजातियों में सब-मेटासेन्ट्रिक क्रोमोसोम के एक युग्म (Pair) पर एजी एन ओ आर लोकेलाइज्ड थे। एन ओ आर, *ऑ. बेलागेंरी* में सब-मेटासेन्ट्रिक क्रोमोसोम के एक युग्म पर, जबकि *को. फासिएटस* में चार युग्मों पर पाए गए। दोनों प्रजातियों में सी-बैन्ड्स कई क्रोमोसोम पर पाए गए।

### लोब्सटर्स में पालीमारफिक माक्रोसेटेलाइट मार्कर्स

लोब्सटर्स एक बहुत ही मूल्यवान समुद्री खाद्य पदार्थ है। अन्तर्राष्ट्रीय बाजार में इनकी भारी मांग तथा आकर्षक कीमतों के कारण, हाल के वर्षों में लोब्सटर्स के दोहन में अत्यधिक वृद्धि हुई है। यद्यपि लोब्सटर्स की 16 लिटौरल एवं 6 गहरे समुद्र की

प्रजातियां पाई जाती हैं किन्तु कुल 4 लिटौरल तथा 1 गहरे समुद्र की प्रजाति ही व्यवसायिक मात्स्यिकी में योगदान करती हैं। ये प्रजातियां हैं : *पेन्युलिरन होमारस*, *पे. बॉलाफेगस*, *पे. वर्सीकोला*, *पे. ओरनेटस*, *थीनस आरिऐन्टेलिस* एवं *प्युरेडुलस सेवेली*। संस्थान की कोचीन इकाई पर *पे. होमारस* तथा *थी. आरिऐन्टेलिरन* की आनुवंशिक संरचना का अध्ययन आरम्भ किया गया। इन प्रजातियों में कुल 21 पालीमारफिक माइक्रोसेटेलाइट चिन्हकों की पहचान की गई। इन चिन्हकों का प्रयोग, इन प्रजातियों की जनसंख्या आनुवंशिकी के अध्ययन में, किया जा रहा है।

### मछली में क्लोरपायरीफास के आनुवंशिक विषाक्तता प्रभाव

कामेट ऐसे द्वारा मीठाजल मुरैल प्रजाति *ओफिसिफेलस पंक्टेटस* को एक मॉडल फिश के रूप में प्रयोग करते हुए, आरगेनोफास्फोरस कीटनाशक क्लोरपायरीफास के आनुवंशिक विषाक्तता प्रभावों का अध्ययन किया गया। आरम्भ में, 96 घण्टे पर LC 50 का मान 811.98 पीपीबी, पाया गया जिससे पता चलता है कि यह कीटनाशक मछलियों के लिए अत्यधिक विषाक्त है तथा जल निकायों में इसकी उपस्थिति मछलियों को खतरा उत्पन्न कर सकती है डीएनए हानि के विश्लेषण से पता चला कि क्लोरपायरीफास आनुवंशिक रूप से भी विषाक्त है।

### संकटग्रस्त प्रजाति चिताला चिताला का, री-सरकुलेटरी तंत्र में सफलतापूर्वक डिम्बक पालन

*चिताला चिताला*, भारत में मीठाजल की एक प्रमुख संकटग्रस्त प्रजाति है जिसके लिए नियंत्रित परिस्थितियों में डिम्बक पालन तकनीक का विकास, इस प्रजाति के स्टाक बढ़ोतरी कार्यक्रमों में बहुत सहायक हो सकता है। ब्यूरो ने इस दिशा में एक अध्ययन किया जिसमें पाया गया कि *चिताला*

चिताला की उन हैचलिंग्स में विशिष्ट वृद्धि दर अधिक थी जो कि जीवित ट्यूबीफेक्स वर्म्स तथा मछली के अण्डों पर आश्रित थे। सर्वाधिक उत्तरजीविता दर जीवित ट्यूबीफेक्स पर आश्रित डिम्बकों में पाई गई। प्रयोगों से पता चला कि चिताला

चिताला के कैप्टिव प्रजनन से उत्पन्न हैचलिंग्स को, उच्च वृद्धि एवं उत्तरजीविता दर की प्राप्ति हेतु, प्रयोगिक री-सरकुलेटरी तंत्र में सफलतापूर्वक पाला जा सकता है। इस प्रकार की यह पहली शोध रिपोर्ट है।

## मानव संसाधन विकास

### “बेसिक टूल्स इन मालीक्युलर बायोलॉजी रिसर्च” पर प्रशिक्षण कार्यक्रम

एनबीएफजीआर ने “बेसिक टूल्स इन मालीक्युलर बायोलॉजी रिसर्च” पर फरवरी 5–9, 2007 के दौरान एक प्रशिक्षण कार्यक्रम का आयोजन किया। प्रशिक्षण में भाग लेने वाले सहभागियों को आणविक जीव-विज्ञान शोध में प्रयोग होने वाले विभिन्न प्रकार के टूल्स से सम्बन्धित सिद्धांत्मक एवं व्यावहारिक प्रशिक्षण दिया गया। इस प्रशिक्षण में भारत के विभिन्न शोध संस्थानों/विश्वविद्यालयों/राष्ट्रीय संस्थानों से आए 9 सहभागियों ने भाग लिया।

### मछलियों में जीनोटाक्सिसिटी बायोमार्कर्स पर प्रशिक्षण

संस्थान में “जीनोटाक्सिसिटी बायोमार्कर्स इन फिशेज” पर फरवरी 15–21, 2007 के दौरान एक प्रशिक्षण कार्यक्रम आयोजित किया गया। सहभागियों को कुछ मानक ऐसेज द्वारा मछलियों तथा अन्य जलीय जन्तुओं में आनुवांशिक विषाक्तता के अध्ययन से सम्बन्धित प्रशिक्षण दिया गया। इस प्रशिक्षण में 21 सहभागियों ने भाग लिया।

### डीएनए मार्कर तकनीक पर एनबीएफजीआर कोचीन इकाई द्वारा कोचीन में प्रशिक्षण

ब्यूरो की कोचीन इकाई ने “डीएनए मार्कर तकनीक : सिद्धान्त एवं उपयोग” पर फरवरी 21–मार्च 03, 2007 के दौरान कोचीन में एक प्रशिक्षण कार्यक्रम का आयोजन किया। जिसमें 21 सहभागियों ने भाग लिया।

### “फिश डिसेज रिपोर्टिंग सिस्टम” पर राज्य मात्स्यकी अधिकारियों के लिए प्रशिक्षण कार्यक्रम

संस्थान ने एक नया प्रयास करते हुए, “फिश डिसेज रिपोर्टिंग सिस्टम” पर, राज्य मात्स्यकी विभागों के अधिकारियों के लिए मार्च 7–9, 2007 के दौरान एक प्रशिक्षण कार्यक्रम आयोजित किया जिसमें 10 राज्यों के 21 मात्स्यकी अधिकारियों ने भाग लिया।

### “मालीक्युलर मार्कर्स एन्ड जेनेटिक डायवर्सिटी एनालिसिस” पर प्रशिक्षण

संस्थान ने “मालीक्युलर मार्कर्स एन्ड जेनेटिक डायवर्सिटी एनालिसिस” पर मार्च 12–21, 2007 के दौरान एक प्रशिक्षण कार्यक्रम आयोजित किया जिसमें देश के विभिन्न शोध संस्थानों व विश्वविद्यालयों के 18 सहभागियों ने भाग लिया।

### महत्वपूर्ण बैठकें

संस्थान की शोध सलाहकार समिति की बैठक डा. ई.जी. सायलास, पूर्व कुलपति, केरल कृषि विश्वविद्यालय की अध्यक्षता में, फरवरी 9–10, 2007 को आयोजित हुई।

संस्थान की स्टाफ शोध परिषद की वार्षिक बैठक मार्च 30–31, 2007 को डा. वजीर एस लाकड़ा, निदेशक की अध्यक्षता में आयोजित हुई।

## व्याख्यानों का आयोजन

संस्थान में निम्नलिखित आमंत्रित विशेषज्ञों द्वारा व्याख्यान दिए गए :

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## अन्य गतिविधियां

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- संस्थान के वैज्ञानिकों ने तिमाही के दौरान विभिन्न स्थानों पर 5 तकनीकी व्याख्यान दिए।
- संस्थान ने उत्तर प्रदेश के विभिन्न भागों में आयोजित तीन कृषि एवं मत्स्य प्रदर्शनियों में भाग लिया तथा देश के विभिन्न भागों से आए कृषकों एवं छात्रों ने संस्थान का भ्रमण किया।
- भारतीय कृषि अनुसंधान परिषद, नई दिल्ली के निर्देशानुसार केन्द्रीय मात्स्यिकी शिक्षा संस्थान, मुम्बई के चिनहट, लखनऊ स्थित केन्द्र का, राष्ट्रीय मत्स्य आनुवंशिक संसाधन ब्यूरो, लखनऊ में विलय किया गया।
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- लखनऊ की नगर राजभाषा कार्यान्वयन समिति द्वारा, ब्यूरो को हिन्दी में कार्यशाला आयोजित करने पर, एक सान्तवना प्रमाण-पत्र प्रदान किया गया।
- संस्थान में गणतंत्र दिवस समारोह उल्लासपूर्वक मनाया गया। इस अवसर पर संस्थान के स्टाफ व उनके परिवार के सदस्यों हेतु क्रीड़ा प्रतियोगिताएं भी आयोजित की गईं। सभी विजेताओं को निदेशक डा. वजीर एस. लाकड़ा ने पुरस्कार वितरित किए।

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**E-mail:** [nbfgr@sancharnet.in](mailto:nbfgr@sancharnet.in); [director@nbfgr.res.in](mailto:director@nbfgr.res.in)

**Website :** <http://www.nbfgr.res.in>