CIFRI News

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Prof A P Sharma was one of the Sectional Presidents in the 100th Indian Science Congress

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Net-Pen enclosure for fish culture in Manipur wetland

CIFRI celebrated 67th Foundation Day

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

CENTRAL INLAND FISHERIES RESEARCH INSTITUTE
Barrackpore, Kolkata - 700 120

Director's Column

CIFRI has been proud to be associated with organizing the 100th Session of Indian Science Congress at Calcutta University, Kolkata. The event attracted unprecedented gatherings of over 10,000 delegates including Nobel laureates and eminent scientists from India and abroad. I was privileged to be elected as the Sectional President of Animal, Veterinary and Fisheries sciences of this Congress. Record number of papers have been submitted in this section. Moreover, the exhibition stall of CIFRI at 'Pride of India Exhibition' and the Public Outreach Session was highly appreciated by the dignitaries. Concurrent with the congress, CIFRI together with AEHMS, Canada and IFSI, Barrackpore organized a Satellite Symposium on 'Health and Fisheries of the Major river Ecosystems of India with emphasis on river Ganga' during January 05-06, 2013. Second Pillay Aquaculture Foundation Congress, visit of QRT team, RAC meeting, IRC meeting were the other major events of CIFRI during this six months period.

In the research front, CIFRI was successful in sequencing the whole genome of two phenol degrading bacteria of which the whole genome analysis of Ochrobactrum anthropi has identified presence of wide array of beneficial chemical degrading genes making it a potential candidate in pollutant degradation in field condition. Similarly a total of 262 salt stress tolerant bacteria were isolated of which 88 isolates were identified using 16S rRNA gene sequence based molecular tools. Four bacterial cultures have been submitted to NBAIM, Mau Nath Bhanjan. We have also developed a comprehensive and exclusive proteogenomics database for fish and shell fish, FISHPROT. Abundance index of the exotic fishes in 74 open water bodies spread across the southern, northern, eastern and north-eastern states was estimated which was ranged from 0.2 to 65%. Experiments in two different kinds of wetlands showed that the variation of enzyme activity can be used as a biochemical indicator to assess status of the wetlands.

Mahakumbh Mela is one of the grand mass bathing rituals of Hindus. CIFRI, Allahabad jointly with other organizations estimated the water flow requirements and water quality during Mahakumbh 2013 at Triveni Sangam, Allahabad which showed insignificant deterioration of water quality even after bathing of millions of people. Bayesian Belief Networks model showed that the Sabarmati estuarine system is environmentally degraded to the tune of 79.26%. Experiments in the wetlands of Manipur showed that net pen enclosures can be used for economically viable culture of different fish species. Experiment has also shown that additives in feed improve growth performance of fishes in cages in reservoir.

The last six months have been very productive as number of research papers, book chapters, bulletins, manuals, pamphlets and abstracts have been published. Thirteen trainings and five mass awareness camps were organized. Some of the CIFRI staff got fellowships, DBT overseas associateship and PhD degrees. We congratulate them. A total of 13 staff including two Head of the Divisions got superannuated. I join all the staff in wishing them a happy post retirement life. We heartily welcome two new staff who joined our institute recently. It is a matter of deep sorrow that one of our beloved colleagues Sh Satyabrata Banerjee, SSS left for his heavenly abode on January 14, 2013. We pray to God that his soul may rest in peace.

Any suggestions from our learned readers are welcome.

Barrackpore,
August, 2013

A. P. Sharma

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Director, CIFRI presided over the Animal, Veterinary and Fishery Sciences Section of the 100th Indian Science Congress

Indian Science Congress is a professional body under the Department of Science & Technology, Ministry of Science & Technology, Government of India. The centenary session of the Congress was held at Calcutta University, Kolkata during the period January 03-07, 2013. Prime Minister Dr Manmohan Singh who is the General President of the conference presided over the event. The central theme of this session was 'Science for Shaping the Future of India'. The event attracted huge gatherings over 10,000 delegates including Nobel laureates and eminent scientists from India and abroad. The event was inaugurated by the President Sh Pranab Mukherjee. In his address the Prime Minister urged the Indian scientific community to accord priority to certain key scientific issues including enhancing scientific temper in the country through greater investment in popularising science, not only in schools and colleges, but also at home, workplace and the community at large. He put special emphasis on research in agricultural production and productivity. During the event the Prime Minister released the Science, Technology and Innovation Policy. This policy seeks to position India among the top five global scientific powers by 2020.

CIFRI was proud to be associated with this mega event. The Director Prof A.P. Sharma was the Sectional President of Animal, Veterinary and Fisheries Sciences of this 100th Indian Science Congress. Record number of papers were submitted in this section. CIFRI also actively participated in the Pride of India Exhibition. The exhibition stall of CIFRI was visited by DG, ICAR and other distinguished visitors. The Institute also took part in the Public Outreach Session which was conducted by ICAR during the Indian Science Congress. The role and contribution of CIFRI in 100th Indian Science Congress was appreciated by the organizing Committee. CIFRI together with Aquatic Ecosystem Health and Management Society, Canada and Inland Fisheries Society of India, Barrackpore organized a Satellite Symposium on 'Health and Fisheries of the Major river Ecosystems of India with Emphasis on River Ganga' during January 05-06, 2013 concurrently.

Research Highlights

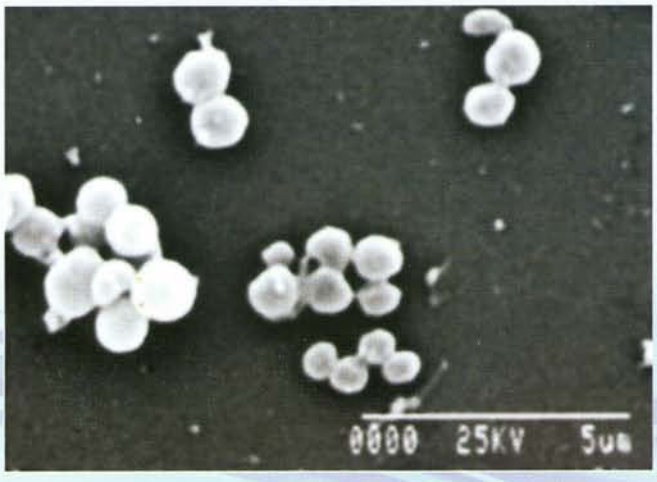
Whole genome sequence of phenol degrading bacteria

Biosafety is a major concern in pollution bioremediation programmes in openwaters for which absence of virulence genes in the bacterial inoculation is essential. Further, understanding the degradation ability of the bacteria for wide array of chemicals will also be helpful in their wide environmental use. Whole genome of two phenol degrading bacteria namely *Bacillus subtilis* (strain Hala) and *Ochrobacterium anthropi* (strain PCP60a) were sequenced in Illumina platform. The complete genome was annotated in RAST server and important genes were identified. Whole genome analysis has identified presence of wide array of pollutant degradating genes involved in glutathione-dependent formaldehyde detoxification, salicylate ester degradation, toluene degradation, quinate degradation, benzoate degradation, p-hydroxybenzoate degradation, chloroaromatic degradation pathway, catechol branch of beta-ketoadipate pathway, salicylate and gentisate catabolism, protocatechuate branch of beta-ketoadipate pathway, n-heterocyclic aromatic compound degradation, aromatic amine catabolism, thioredoxin-disulfide reductase, alkanesulfonates utilization, and alkylphosphonate utilization in *Ochrobactrum anthropi* and absence of pathogenecity or virulence gene making it a potential candidate in pollutant degradation in field condition. Strains of *Bacillus subtilis* had both chemical degradation genes and virulence and pathogenicity genes which make it unsuitable to be used for field application.

S. K. Manna, S. Samanta, S. K. Nag, Md. Aftabuddin, P. Maurye and S. Das

Salt stress tolerant bacteria from water, sediment and salt crystal

The isolation of bacteria from natural open water resources and identification of their salt tolerant genes is promising towards their use for improvement of salt tolerance of various crops and animal species. A total of 262 salt stress tolerant bacteria were isolated from water, sediment and salt crystal samples of West Bengal, Orissa and Andhra Pradesh, of which 88 isolates were identified using 16S rRNA gene sequence based molecular tools. Scanning electron microscopy of 12 isolated halotolerant bacteria have been carried out for morphological study. Based on physiological study, the number of microbes resistant to 30%, 25%, 20%, 15%, 10% and 5% NaCl concentration were 1, 8, 25, 52, 240 and 245 respectively. The whole genome transcriptome sequencing have identified 324 salt stress related ESTs and other 931 ESTs from *Staphylococcus epidermidis* grown in 20% salt condition. Four bacterial cultures (*Bacillus cereus, Serratia rubidaea, Pseudomonas aeruginosa* and *Pseudomonas stutzeri*) have been submitted to National Bureau of Agriculturally Important Microorganisms (NBAIM), Mau Nath Bhanjan.



B. K. Behera and D. K. Meena

FishProt - a web based database of fish proteomics

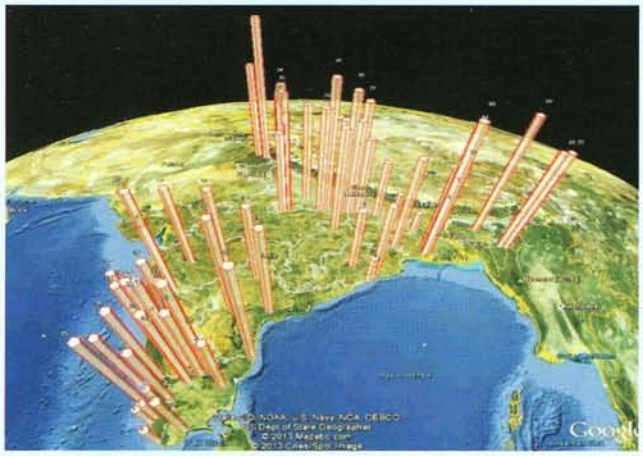
CIFRI has developed a comprehensive database (FISHPROT) which is a "Biological Fish Proteomioc Database for Biomarker Discovery and Evaluation". FISHPROT is exclusive for fish and shell fish proteogenomics. At present the database contains information on muscle proteome of IMC *Catla catla*, lens proteome of riverine cat fish *Rita rita*, liver proteome of the murrel *Channa striatus* and plasma proteome of IMC *Labeo rohita*. This web based database is linked to important national and international proteomics and bioinformatics resource sites like NCBI, SWISSPROT and Proteomic Societies like SPS, BSPR and PSI etc. The Database was formerly launched by Prof A. P. Sharma on May 29, 2013. The database can be accessed at : http://www.cifri.ernet.in/fishprot.html

B.P. Mohanty, D. Karunakaran and A. P. Sharma

Exotic fish species in inland openwaters

Exotic fish species are frequently encountered in open water resources impacting the indigenous fish biodiversity. Survey-based primary data and available secondary information from selected rivers, estuaries, reservoirs and wetlands across the country revealed presence of 15 species of exotic fishes with 10 species having food value (*Hypophthalmichthys molitrix, H. nobilis, Ctenopharyngodon idella, Cyprinus carpio, Barbonymus gonionotus, Systomus tetrazona, Oreochromis niloticus niloticus, O. mossambicus, Clarias gariepinus, Piaractus brachypomus, Osphronemus* sp.) and 4 having no food value (*Pterygoplechthys disgunctivus, P. pardalis, Gambusia affinis, Barbonymus altus*). The abundance index of the exotic fishes in 74 open water bodies spread across the southern, northern, eastern and north-eastern states ranged from 0.2 to 65%. Exotics in the Ganga and Yamuna rivers at Allahabad comprised of *Oreochromis niloticus, Cyprinus carpio, Hypophthalmichthys molitrix, Hypophthalmichths nobilis, Ctenopharyngodon idella*, and *Clarias gariepinus* contributing 65% to the total catch. Presence of all life stages and brooders indicates that common carp and tilapia have established

along Allahabad stretch of the rivers. East Kolkata Wetlands, undergoing extensive culture and culture-based fisheries, revealed sizeable presence of exotics to the tune of 55-65 % of total production. Data collected from Dumbur reservoir, Tripura showed *Cyprinus carpio* (common carp) as the only exotic fish with negligible contribution (0.5%) to the total catch.



V. R. Suresh, B. C. Jha, K. D. Joshi, S. Yengkokpam, F. Khan, P. Panikkar, A. Ekka, D. K. Biswas, S. Saha, S. Das, Y. Ali, M. E. Vijaykumar, K. K. Sarma and A. Kakati

Sediment enzyme and biochemical quality as health indicator to differentiate sewage–fed and natural wetland ecosystem

Wetland health is governed by a number of factors including ecological regimes and catchment nutrient status. Assessing the health of wetland need identifying and standardizing ecosystem health indicators where sediment biochemical quality especially enzymes can play a pivotal role. Two wetlands, viz. sewage–fed (Jhagrasisa) and natural (Khalsi) with varied ecological regimes and nutrient inputs were characterized based on their sediment enzyme and biochemical quality for identifying biochemical indicators for health assessment. Sediment organic matter was found to vary between the two wetlands, with Khalsi having more organic matter and carbon than Jhagrasisa. The potential of availability of sediment phosphorous was higher in Jhagrasisa (9.1%) than in Khalsi (8%). Total heterotrophic bacteria was 13 times more in Khalsi than Jhagrasisa, while phosphatase producing bacteria showed marginal variation between the wetlands with higher value in Khalsi than Jhagrasisa. Activity of β-glucosidase varied widely among the wetlands with Khalsi having higher activity than Jhagrasisa. Acid phosphatase and alkaline phosphatase activity showed a greater variation in Jhagrasisa and Khalsi with nearly 3 - 4 times higher activity in Khalsi than in Jhagrasisa. Khalsi had higher organic matter and carbon contents than Jhagrasisa. Variations in enzyme activity can be used as a biochemical indicator to assess status of the two wetlands.

Md. Aftabuddin and M.A. Hassan

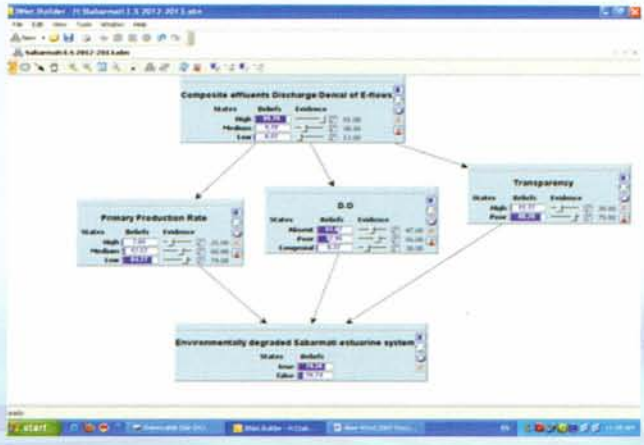
Water flow requirements and water quality at Triveni Sangam during Mahakumbh Mela

WWF-India in collaboration with Central Inland Fisheries Research Institute; IIT, Kanpur and Varanasi and Peoples Science Institute, Dehradun estimated Environmental Flow at Triveni Sangam, Allahabad during Mahakumbh 2013 (14th January to 10th March 2013). Besides bathing requirements for millions of pilgrims, sufficient water flow in desired depth and velocity was also required to sustain the aquatic life in the river. A group of biodiversity experts from above organisations projected flow requirements of the stakeholders by adopting widely accepted Building Block Methodology (BBM). Based on field visits, secondary data and expert's opinion it was recommended to maintain 1.5 m water depth. Corresponding to this stage the estimated flow was 310 cumecs (10,950 cusecs) and the estimated water surface width for this stage was 325 m. Further, studies were conducted to assess the impact of aggregation of millions of people at Triveni Sangam. Analysis of water samples from 7 sampling sites in the river Ganga-Yamuna before, during and after main bathing days during Mahakhubh 2013 showed no significant changes in water quality in River Ganga at Allahabad zone, due to release of recommended water discharge.

K.D. Joshi, S. S. Mishra, B. K. Singh, D. N. Jha and M. A. Alam

Bayesian Belief Networks in health assessment of the Sabarmati estuarine system

India has an estimated estuarine area of 2.7 million ha which are important fisheries resources. However, construction of dams, release of effluents etc. have adversely affected the estuarine health of the country. In present study the Sabarmati estuarine health has been assessed through software based predictive models viz. Bayesian Belief Networks (BBNs) using biotic and abiotic attributes as input parameters. The BBNs model was developed considering composite effluents discharge coupled with denial of environmental flow as the main causes of environmental degradation of Sabarmati estuarine system which affect transparency, D.O and primary production. After incorporation of beliefs, BBNs calculated beliefs to be true to the extent of 76.78%. Inputs of evidences finally calculated that Sabarmati estuarine system is environmentally degraded to the tune of 79.26%.



S. N. Singh and S. Monalisa Devi

Feasibility of pen culture in wetlands of Manipur

A pen culture demonstration was carried out in Takmu *pat* of Bishnupur district in collaboration with the Directorate of Fisheries, Govt. of Manipur for assessing feasibility of undertaking pen culture in wetlands of Manipurs. A pen of approximately 0.1 ha area was constructed using nylon net (25 mm mesh size) supported with bamboo poles at an interval of 1.5 m. The pen was stocked with stunted yearlings of Indian Major Carps, a minor carp pengba (*Osteobrama belangeri*) and exotic carps @ 5 fingerlings/m^2. The stocked fishes were fed with commercially available pelleted feed (23.4% crude protein) @ 5% of body weight twice daily. The highest average percentage weight gain was recorded for pengba (1107.55±2.92), followed by grass carp (785.42±53.21), catla (738.82±16.78), mrigal (323.39±7.6), rohu (251.19±6.97), common carp (191.08±4.88) and silver carp (123.01±4.6). Similarly, the highest specific growth rate (SGR) was recorded for pengba (1.38) and lowest for silver carp (0.45) indicating suitability of culturing *O. belangeri*, a high-demand indigenous minor carp in pen enclosure in the pats. Grass carp and catla were also found to be suitable for culturing in pen enclosures in the pats of Manipur. The benefit-cost ratio was found to be 1.29. The demonstration showed that net pen enclosures can be used for culturing different fish species having local demand for producing table fish in the wetlands of Manipur.

B. K. Bhattacharjya, D. Debnath, Sona Y., A. K. Yadav, P. Das and K. K. Sarma

Feeding of additives improves growth performance of fishes in cages in reservoir

Culture of Indian Major Carps in cages may cause stress-mediated reduction in growth and feed efficiency. Beneficial effect of probiotics and attractant in form of increasing feed intake and utilization has been tested for cage environment in reservoir. Two experimental diets, containing probiotics and attractant (D1) and another containing probiotics, attractant and anti-stressor agent (D2), a reference diet having none of these ingredients (RD) were fed to fishes for 45 days. The effect of inclusion of probiotics, attractant and anti-stressor agent in fish feed were manifested by marginal increase in weight gain (5%) due to inclusion of probiotics and attractants, while markedly higher (58%) weight gain due to addition of anti-stressors. Carcass quality was also improved in term of increased crude protein and decreased crude lipid content in the order of D2>D1>RD. FCR was observed to be better than indoor growth trials of feed containing probiotics and attractants.

Md. Aftabuddin, M. A. Hassan and D. K. Meena

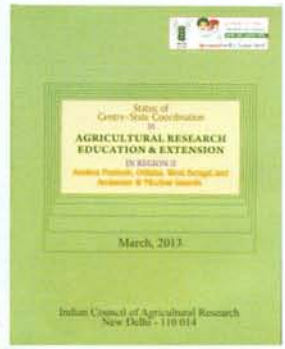
Publications

During the six months period the following documents were published:

Research papers	: 20
Book Chapters	: 14
Abstracts	: 84

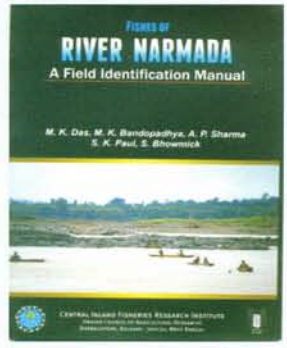
Special Publications

Status of Centre – State Coordination in Agricultural Research & Education



The ICAR Region II includes the states of Andhra Pradesh, Odisha, West Bengal and Andama & Nicobar Island. This region is surplus in many commodities and contribute major share in national production of rice, maize, tobacco, jute and mesta, livestock products like egg, meat and fish. This document is the outcome of the 21st Meeting of the ICAR Regional Committee II, held at NAARM, Hyderabad during July 19-20, 2012. This compendium incorporates the scenario of research and transfer of relevant technologies in agriculture, horticulture, animal husbandry and fisheries in the region. The compendium contains useful data on production and productivity of various crops, livestock and fisheries in the region. It highlights the major recommendations made at the meeting, which focus on emerging issues, problems and prospects of R&D on various agricultural commodities of the region.

Fishes of River Narmada: A field identification manual



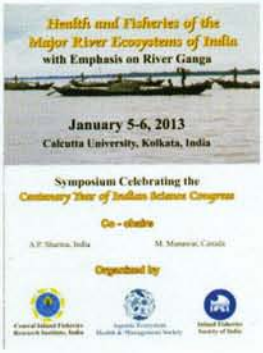
The Indian fish fauna is an assemblage of about 2500 species, of which 930 species belonging to 326 genera inhabit the inland waters. For these valuable aquatic resources, a database of the available fish species with respect to their morphological, biological and adaptive characters along with their common names is essential for management and conservation. This manual has been prepared based on research work carried out at CIFRI which would serve as a quick identification guide for students, teachers and extension personnel and aquaculturists.

मछली का औषधीय गुण

मछली एक स्वास्थ्यप्रद भोजन है तथा प्रोटीन के स्त्रोत के रूप में सस्ते मूल्य पर उपलब्ध है। यह एक सर्वमान्य तथ्य है कि मछली में चिकित्सकीय तत्व/गुण उपलब्ध हैं और जो अनेक रोगों के इलाज में सहायक हैं। चूंकि मछली प्रोटीन का एक सस्ता स्त्रोत है, इसलिये अविकसित और विकासशील देशों में प्रोटीन की कमी के कारण उत्पन्न कुपोषण के निदान में यह अत्यन्त लाभकारी है। मछली पोलिअनसैचुरेटेड फैटी एसिड का एक पौष्टिक स्त्रोत है अतः ओमेगा–3 वसा अम्ल को नाड़ी संबंधी रोग जैसे हृदय रोग, गठिया, भुलक्कड़पन, उम्र के कारण मांसपेशियों का क्षय होना, दमा और मानसिक अवसाद/विकार इत्यादि के निदान के लिये प्रयोग किया जा रहा है। प्रस्तुत बुलेटिन, मछली का औषधीय गुण

भारतीय कृषि अनुसंधान परिषद् के आउटरीच एक्टीविटी–3 कन्सार्टियम के अन्तर्गत प्रकाशित आहारी घटक और पोषक तत्व प्रोफाइलिंग के रूप में मछली का मूल्यांकन मछली के औषधीय गुणों पर आधारित है। यह मछली के औषधीय गुणों पर विस्तृत प्रकाश डालता है।

Health and fisheries of the major river ecosystems of India-with emphasis on river Ganga

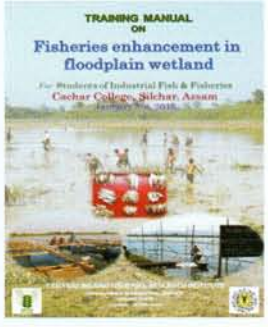


India is endowed with rich water resources including 14 major rivers. Among them river Ganga occupies a unique position in the history, culture, religion and civilization of the Indian subcontinent. In recent decades, India's water resources and especially her rivers have been exposed to various anthropogenic stresses. However, the data available on the fishes, fisheries and the health of these rivers in India are fragmented and scattered. CIFRI, Aquatic Ecosystem Health & Management Society (AEHMS), Canada and IFSI organized the international symposium entitled 'Health and fisheries of the major river ecosystems of India-with emphasis on river Ganga' in conjunction with the 100th Indian Science Congress at Kolkata. The abstracts of the paper presented was published in the form of this book which was edited by A.P. Sharma of CIFRI, Barrackpore and M. Munawar of AEHMS of Canada.

राजभाषा (हिन्दी) की गतिविधियाँ एवं उपलब्धियाँ

फरवरी 2013 में संसदीय राजभाषा समिति के आगमन के दौरान संस्थान द्वारा राजभाषा (हिन्दी) की गतिविधियाँ एवं उपलब्धियों पर एक बुलेटिन का प्रकाशन किया गया। इस बुलेटिन में संस्थान की राजभाषा (हिन्दी) संबंधी गतिविधियों पर प्रकाश डाला गया है। इसमें संस्थान द्वारा हिन्दी मे प्रकाशित बुलेटिन, पोस्टरों एवं लिफलेट के साथ संस्थान के विकास और इसकी ऐतिहासिक घटनाओं से जुड़े विशिष्ट महानुभावों की झलकियाँ दी गई हैं।

Training manuals



Three training manuals were published by CIFRI during the period. 'Fisheries enhancement in floodplain wetland' was compiled and edited by Sona, Y., Dipesh, D. and Yadav A. K. The manual contains lecture delivered during the training programme on 'Fisheries enhancement in floodplain wetland' at CIFRI Regional Centre, Guwahati during January 02-08, 2013 for the students of Cachar College, Assam.

'Fisheries enhancement/culture-based fisheries in floodplain wetlands for increasing fish yield on sustainable basis' is another training manual compiled and edited by Das, P., Yadav, A. K. and Bhattacharjya, B. K. The manual contains lectures delivered during the training programme on 'Fisheries enhancement / culture-based fisheries in floodplain wetlands for increasing fish yield on sustainable basis' at CIFRI Regional Centre, Guwahati (sponsored by DOE, New Delhi) during January 29-February 05, 2013 for department officials of West Bengal, Punjab and Assam along with the KVK officials from AAU, Jorhat and Arunachal Pradesh. 'Wetland fishery management techniques' is a 106 pages training manual released from Guwahati centre. This manual was compiled and edited by Das, P., Yadav, A. K. and Bhattacharjya, B. K and contains lecture delivered during the training programme on 'Wetland fishery management techniques' at CIFRI Regional Centre, Guwahati (sponsored by NFDB, Hyderabad) during February 19 - 23, 2013for department officials of West Bengal, Bihar, Assam and Arunachal Pradesh.

Small Indigenous fishes for nutritional security and rural livelihood

Small indigenous fishes are rich sources of animal protein and essential micronutrients. They occupy an important space in the diet of rural population. However, most of the people are not aware about the nutritional value of these fishes. This pamphlet was published in both english and Bengali languages to increase the awareness regarding the nutrional value of these fishes. The awareness would help in conservation of the SIFs.

Genomic resources submitted to NCBI Gene Bank

Accession nos. of bacterial 16S gene: JX000001, JX024253, JX134615-134618, JX437940-437942. JQ265998-266008, JQ965767-965768, JQ957862-957863, JQ995148, JX024250, JN172939, JX024251-024252, JX047377-047380, Jx081585.

88 Accession numbers received from NCBI GenBank for microbial 16S rRNA gene sequences.

324 Salt stress related genes (ESTs) have been submitted to NCBI Gen Bank and accession numbers received (JZ198817-JZ198968, JZ198969-JZ199140).

931 other genes (ESTs) have been submitted to NCBI Gen Bank and accession numbers received (JZ347617-JZ348547).

310 Accession numbers received from NCBI Gen Bank for Cytochrome b gene of *L. rohita, C.catla, C.mrigala* species.

35 Accession numbers received from NCBI Gen Bank for ATPase 6/8 gene of *L. rohita, C. catla, C. mrigala* species.

GenBank Accession Nos. of *Catla catla* muscle transcriptomes : KC788422, KC788423, Kc788424, KC7887541, KC816537, KC816538, KC816539, KC816540, KC816541, KC816542, KC887542, KC887543, KC887540, Kc887544, KC887545, Am690341.

Awards/Recognitions

Name	Award/Recognition	Awarding authority
Dr K.D. Joshi	Honorary Fellowship	Bioved Research Institute of Agriculture & Technology, Allahabad
Sh Feroz Khan	PhD degree for his research work 'Trophic modeling for ecosystems based fisheries management of an Indian reservoir'	CMJ University, Shillong
Dr M. K. Bandyopadhyay and Dr B. P. Mohanty	Chief Guest and Guest of Honour for the inaugural programme of training programme on 'Ornamental fish breeding and culture'	eAqua Agro RMCMSS Ltd., Barrackpore
Dr B. P. Mohanty	Expert Member in selection committee for faculty member	Shri Venkateswara Veterinary University, Tirupati
Dr D. Debnath	DBT Overseas Associateship	Department of Biotechnology, Ministry of Science and Technology, Govt. of India
Ms. Deepa Sudheesan	PhD degree for her research work on 'Species differentiation of grey mullets (family: Mugilidae) from Indian waters'	CIFE, Mumbai

Exhibitions

Name	Date	Venue
Pride of India expo: 100th Indian Science Congress	January 03 – 07, 2013	Salt Lake Stadium, Kolkata
Gaighata block *Puspa Krishi O Shilpo Mela*	January 12 – 20, 2013	Thakurnagar, N 24 Parganas, WB
Exhibitions organized by Krishi Vigyan Kendra, Kausambi, Uttar Pradesh *Virat Krishi Mela*	January 26, 2013	KVK, Kausambi, UP.
XIth Agricultural Science Congress Exhibition	February 07 – 09, 2013	OUAT, Bhubaneswar, Odisha
2nd PAF congress Exhibition	February 09 – 11, 2013	CIFRI, Barrackpore
Agri-business camp	February 13, 2013	NRC on Pig, Rani, Guwahati
Kerala Agri Food Pro Meet	February 18-21, 2013.	Jawarlala Nehru Stadium, Kochi, Kerala
Agricultural Scientists and farmers Congress Exhibition	February 22 – 24, 2013	Bioved Research Institute of Agriculture and Technology, Allahabad, UP
Kisan Mela	March 17, 2013	Katihar, Bihar
International symposium exhibition	May 21-23, 2013	CIFT, Kochi

Mass Awarness Campaigns

Name	Date	Venue	Participants
Ganga Nadee kee bahumulya matsya sampada ke Sanrakshyan evam Sambardhan ke Upay (in Hindi)	February 04, 2013	Gopalpur, Madguda village near Vindhyanchal town of Mirzapur district of UP	100 fishers
Conservation of river fisheries in Uttar Pradesh	February 23, 2013	Bioved Research Institute of Agriculture and Technology, Allahabad,	120 river fishers
Small indigenous fish for nutritional security and rural livelihood	March 22, 2013	Madanganj, Namkhana, S 24 Parganas, WB	300 men & women fishers and fish farmers
Matsya Palan Evam Matsyikee Vikas under TSP Programme	March 17, 2013	Chandan Chouki, Paliya, Lakhimpur district of Uttar Pradesh	200 tribal fishers, fish farmers, tribal women and villagers
Recent advances in wetland management with integrated farming, fish health management and fish feeding management, Jointly organized by CIFRI, BTC, Aquaculture Development Organization for ST, SC & Backward Classes, Assam and Aqua-International, Kolkata	April 12, 2013	Koklabari, Barma, Dist. Baksa, Assam	200 people

Transfers

Name &Designation	Last place of posting	Date of relieve
Sh R Balamurugan, T-3, Driver	Bangalore	February 18, 2013 (AN)
Dr P K Katiha, Principal Scientist	Barrackpore	April 09, 2013 (AN)
Ms S Monalisa Devi, Scientist	Vadodara	April 16, 2013 (AN)

Superannuation

Name & Designation	Last place of posting	Date of superannuation
Dr B C Jha, Head RWF Division	Barrackpore	January 31, 2013
Sh J K Patra, SSS	Kolkata	January 31, 2013
Sh D Sanfui, T-5	Barrackpore	February 28, 2013
Sh S K Ghosh, T-5	Barrackpore	February 28, 2013
Sh K K Dutta, T-5	Barrackpore	February 28, 2013
Sh S K Sadhukhan, T-8	Kolkata	March 31, 2013
Sh S C Burman, SSS	Barrackpore	March 31, 2013
Dr U Bhaumik, Head REF Division	Barrackpore	April 30, 2013
Sh B N Das, T-5	Barrackpore	April 30, 2013
Sh Karam Raj, T-1	Allahabad	April 30, 2013
Sh G Gharami, SSS	Barrackpore	April 30, 2013
Sh J Mukhia, SSS	Barrack pore	May 31, 2013
Sh K Ninge Gowda, SSS	Bangalore	May 31, 2013

Trainings

Name	Date	Venue	Participants
Fisheries enhancement in floodplain wetland	January 02-08, 2013	CIFRI, Guwahati	12 undergraduate students of Cachar College, Assam
Inland fisheries production and resource management	January 16- 22, 2013	CIFRI, Barrackpore	28 fish farmers, Nawada distract of Bihar
Fisheries enhancement/ culture-based fisheries in floodplain wetlands for increasing fish yield on sustainable basis	January 29- February 05, 2013	CIFRI, Guwahati	12 officials from West Bengal, Punjab and Assam fishery departments; KVK officials from AAU, Jorhat and Arunachal Pradesh
Fishery enhancement in large inland waters through enclosed farming	February 18-22, 2013	CIFRI, Barrackpore	18 officials from, state fisheries, fisheries corporation and KVK
Wetland fishery management techniques	February 19-23, 2013	CIFRI, Guwahati	12 officials from fisheries departments of West Bengal, Bihar, Assam and Arunachal Pradesh
Inland fisheries production and resource management	February 27 – March 05, 2013	CIFRI, Barrackpore	28 fish farmers, Begusarai district of Bihar
Inland fisheries production and resource management	February 28 – March 03, 2013	CIFRI, Barrackpore	30 fish farmers, Saran district of Bihar
Ecology and Fisheries assessment of Chilika lake	March 11 – 23, 2013	CIFRI, Barrackpore	Three CDA staff
Matsya Palan Evam Matsyikee Vikas under TSP programme	March 18 – 20, 2013	CIFRI, Allahabad	50 tribal fishers, fish farmers and tribal women
Inland fisheries production and resource management	March 18 – 24, 2013	CIFRI, Barrackpore	30 fish farmers, Khagaria district of Bihar
HPLC : Principle and applications	May 28 – 30, 2013	CIFRI, Barrackpore	Officers of Directorate of Fisheries, Govt. of West Bengal
Inland fisheries development	June 21 – 27, 2013	CIFRI, Barrackpore	30fishers of Banka district of Bihar
Pen aquaculture in beels of Assam for fisheries enhancement (Under NEH Component of CIFRI)	June 24-26, 2013	CIFRI, Guwahati	24 beel lessees/ fishers' co-operative society members from 12 beels under AFDC

New Appointments

Name & Designation	Place of posting	Date of joining
Dr Dibakar Bhakta, Scientist	Barrackpore	April 10, 2013 (FN)
Sh K P Nath, SFAO	Barrackpore	April 18, 2013 (FN)

Promotions

Name &Designation	Promoted to	With effect from
Dr Rani Palaniasamy	Principal Scientist	April 27, 2010
Sh Sudipta Gupta	Asst. Adm. Officer	June 06, 2013
Sh Sarbananda Karmakar	Assistant	June 07, 2013
Sh Uday Bhanu Bhattacharyya	Assistant	June 07, 2013
Sh P K Ghosh	Assistant	June 10, 2013
Smt Jaysree Pal	Assistant	June 07, 2013

Meetings

Seminar on Water Pollution

One day National Seminar on "Water Pollution" was jointly organized by National Environmental Science Academy, West Bengal and Central Inland Fisheries Research Institute at Barrackpore on January 20, 2013. Dr Amit Krishna De, Executive Secretary, Indian Science Congress Association welcomed all the participants. Prof N. C. Dutta, President of National Environmental Science Academy, West Bengal Chapter chaired the Seminar. Dr M. K. Das, Head, FREM Division, CIFRI delivered the Key Note Address on the Impact of water pollution on Fisheries. Many participants highlighted the various problems of water pollution in the seminar.

Quinquennial Review Team Meeting

Quinquennial Review Team Meeting was convened at CIFRI, Barrackpore during February 01-02, 2013 at Barrackpore. Dr M.V Gupta, World Food Prize Laureate is the chairman of QRT meeting. Eminent scientific personnel like Prof L. Kannan, Prof U.C. Goswami, Dr Dilip Kumar, Dr R.S. Biradar, Dr N. Sarangi and Dr Sathiadhas are the other members of QRT. The committee critically reviewed all the activities and achievements of the institute. The team also expressed their satisfaction regarding the achievements of CIFRI during the year 2007-12.

Consultation on 'Prospect of Fish Culture in Sunderbans'

A consultation on 'Prospect of Fish Culture in Sunderbans' was jointly organised by State Government and CIFRI at CIFRI,Barrckpore on 8th February,2013. It was chaired by Dr S.D. Tripathi, Former Director CIFE. Eminent scientists, State personnel , fish farmers and fishers from Sundarban area and the NGO personnels also participated in that programme. An elaborate discussion was held during the session.Overall consultation meeting was proved to be successful.

Pillai Aquaculture Foundation Congress

2nd Pillay Aquaculture Foundation Congress was jointly organized by Pillay Aquaculture Foundation, Central Inland Fisheries Research Institute and Inland Fisheries Society of India during February 09-11, 2013 at CIFRI, Barrackpore. The congress was aimed at providing an effective platform for participation of private agencies, NGOs, fishers, fish farmers, policy makers, investors, researchers and academicians to discuss and deliberate the emerging issues and opportunities in aquaculture and culture based fisheries. Honorable Minister Sri Giriraj Singh, Department of Animal Husbandry and Fishery, Govt of Bihar was the Chief Guest of the programme. Dr S. Ayappan, Secretary, DARE and DG, ICAR delivered the presidential address. Several eminent personnel delivered lectures and shared their valuable thoughts on issues and opportunities in aquaculture and culture based fisheries and its development through PPP mode. On the occasion an exhibition was organized where eight fishery institutes, two publication houses and two corporate houses participated.

Hilsa Advisory Committee Meeting

The Second Advisory Committee meeting of the NFBSFARA funded project on 'Stock characterization, captive breeding, seed production and culture of hilsa (*Tenualosa ilisha*)' was held on April 13-14, 2013 at CIFRI, Barrackpore. Prof A. P. Sharma, Director CIFRI welcomed the Chairman, Dr K. K. Vass, member Prof K. G. Padmakumar; member representative, Dr S. S. Chakraborty and all the participants. The Chairman in his opening remarks stressed that the project workers needs to take it as a challenge and find it as a great opportunity for each partner to make significant contribution in the project. The ATR was discussed and accepted with minor changes. The achievements and progress made by different consortium partners were presented by CCPI, Dr D. N. Chattopadhyay, CIFA, Dr Shubhadeep Ghosh, CMFRI, Dr (Mrs.) Vindhya Mohindra, NBFGR, Dr S. Dasgupta, CIFE, Dr Surjya Saikya, Viswabharti University, Dr Debasis De, CIBA and Dr V. R. Suresh, CIFRI. Major action points regarding research, administrative aspects and deliverables for 2013-14 was also fixed in the meeting. Chairman and members expressed their satisfaction over the detailed interaction of each partner,

appreciated the work done so far but expressed that more thinking for each work component has to be made to achieve the final objective.

Research Advisory Committee Meeting

The Institute Research Advisory Committee (RAC) Meeting was held at Barrackpore during April 05-06, 2013. Prof. Brij Gopal, Chairman, RAC, presided over the meeting. Other members Dr N Sarangi, Dr C. Vasudevappa, Dr V.V. Sugunan, Dr M.R. Bhupendernath and Scientists of CIFRI were also present. The Heads of division, Regional centre and Research stations presented the progress of institute research projects started during XII plan made during the year. The PI of externally funded projects and out-reach projects also detailed the progress. The Charman expressed that urgent attention need to be given for ecological/environmental flow research focusing on cause – effect relationship between river obstruction (dams and barrages) and fisheries through capacity building in river ecological models with international agency and collaboration with Ministry of Water Resources for impact study on fisheries due to river obstruction and integrated water resource management with special focus on ecology and fisheries.

Stakeholders' Meeting at Regional Centre, Guwahati

The centre conducted a 'Stakeholders meeting on R&D linkages in open water fisheries in NE Region' on April 11, 2013 on the occasion of the QRT's visit to the Centre. Officials from the Department of Fisheries, Assam including the Director of Fisheries, Assam and Project Director, AFDC, Ltd; Bodoland Territorial Council, Kokrajhar; Fishery Scientists from Assam Agricultural University, Jorhat; representatives of NGOs and fish farmers participated in the meeting. The QRT of CIFRI comprising Dr M.V. Gupta, Chairman and members Dr Dilip Kumar, Prof L. Kannan, Prof U.C. Goswami and Dr N. Sarangi visited the CIFRI Regional Centre, Guwahati during April 8-15, 2013. The team reviewed the activities of the Centre for the period from 2007-12 on April 11, 2013.

Institute Research Committee Meeting

The annual meeting of IRC was held during May 27-29, 2013 at Barrackpore. Prof AP Sharma, Director presided over the meeting. All the Head of Divisions and scientists of all cadres participated in this important meeting. Scientists also presented their achievements made during previous year and also the future work plans in this meeting. The Chairman expressed that Scientists should strictly follow suggestions of Research Advisory Committee. He emphasized the need for timely submission of appropriate inputs from the regional centers for Monthly, Quarterly and Half yearly reports of the Institute. He explained that the Institute has identified some flagship programmes which are to be given proper focus during the XII Plan. In addition to the regular presentations Dr S.K. Manna, Dr S.K. Nag and Dr Arun Pandit presented and discussed the reporting system including HYPM, Result Framework Documents (RFD) and performance indicator, respectively.

Events

Republic Day

The institute celebrated republic day on January 26, 2013 with great enthusiasm and fanfare. All the institute staff and their family members attended the function. Prof Sharma unfurled the National Flag in front of all the staff and their family members. In his motivating speech, Prof A.P. Sharma, Director urged the staff to perform their respective duties to their potential. Small cultural programme was also organized on this occasion.

CIFRI Foundation Day

Central Inland Fisheries Research Institute, Barrackpore celebrated its 67th Foundation Day on 17th March, 2013. Prof Vinod Tare, IIT, Kanpur and Leader, Consortium of Seven IITs graced this occasion as Chief Guest. In his welcome address, Prof AP Sharma, Director, CIFRI gave a brief account of the institute technologies, activities, outreach programmes and researchable issues for the upcoming years in systematic manner. Prof Tare, in his Foundation day lecture, described the status of the water bodies and cautioned that the water bodies of India, in general, are shrinking and polluted. The rivers, in particular, have low water flow and may carry sewage and industrial effluents during non-monsoon period. He advocated that there is a need of applying modern science and new technologies with traditional wisdom. He proposed that the usage of water should have sequential priority from 'water for life' to 'livelihoods' to 'developmental activities'. There should be institutional arrangements for usage of water based on principles of equity, resource-conservation, protection of water resources, and harmonization of water use. The meritorious wards of the CIFRI staff were also felicitated on this occasion. A small cultural programme by the CIFRI staff was organized.

Dr V N Sharda, the member, ASRB and Sh Mansih Gupta, Mininster Govt of WB visited CIFRI

Dr V.N. Sharda, member of ASRB visited CIFRI on February 22, 2013. He visited CIFRI laboratories and interacted with the Scientists of the institute. He joined the valedictory function of the training programme on 'Fishery enhancement in large open waters'. Sh Manish Gupta, the Minister-in-Charge, Govt of West Bengal also visited CIFRI on 25.06.13. He took keen interest on the activities of CIFRI and appreciated the contribution of CIFRI to the nation.

FISH FACT

Inadequate post-harvest fish handling infrastructure is causing an annual loss of over Rs 15,000 crore to India's marine and inland fisheries sector. This is about 25% of the Inland and marine fish industry which is worth over Rs. 61,000 crore. (Courtesy : ASSOCHAM)

हर कदम, हर डगर
किसानों का हमसफर
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निदेशक की ओर से

रिपोर्ट अवधि के दौरान कलकत्ता विश्वविद्यालय में आयोजित भारतीय विज्ञान कांग्रेस के 100वें अधिवेशन में संस्थान की भूमिका सराहनीय रही। इस अधिवेशन में देश–विदेश के लगभग 10,000 प्रतिनिधियों ने भाग लिया जिसमें नोबेल पुरस्कार विजेता और उत्कृष्ठ वैज्ञानिक थे। सौभाग्यवश, मुझे इस कांग्रेस की पशु चिकित्सा एवं मात्स्यिकी अनुभाग के अध्यक्ष के रूप में कार्य करने का सुअवसर प्राप्त हुआ। इस अनुभाग के अंतर्गत बहुत सारे शोध पत्र प्रस्तुत किये गये। इसके साथ संस्थान की 'प्राइड ऑफ इंडिया' प्रदर्शनी और 'पब्लिक आउटरीच सेशन' मे भाग लेना उच्च पदाधिकारियों द्वारा सराहा गया। इस कांग्रेस के साथ केन्द्रीय अंतर्स्थलीय मात्स्यिकी अनुसंधान संस्थान, बैरकपुर; ए ई एच एम एस, कनाडा और आई एफ एस आई, बैरकपुर के सौजन्य से "हेल्थ एण्ड फिशरीज ऑफ दी मेजर रिवर इकोसिंस्टम्स ऑफ इंडिया विथ एम्फसिस ऑन रिवर गंगा" पर जनवरी 5–6, 2013 के दौरान एक सैटेलाइट संगोष्ठी का आयोजन किया गया। इसी दौरान पिल्लई एक्वाकल्चर फाउण्डेशन कांग्रेस, पंचवर्षीय अनुसंधान दल का आगमन, अनुसंधान सलाहकार समिति बैठक, संस्थान अनुसंधान समिति बैठक और अन्य महत्वपूर्ण बैठकों एवं समारोह का आयोजन हुआ।

अनुसंधान के क्षेत्र में संस्थान ने फेनोल के दुष्प्रभाव को कम करने वाले दो बैक्टीरिया का सिक्वेंसिंग कर उनकी पहचान की है। *Ochrobactrum anthropi* के जीनोम विश्लेषण यह बताते हैं कि इस बैक्टीरिया में प्रदूषण और रसायनिक तत्वों के प्रभाव को कम करने की विशेष संभावना है। इसी प्रकार, लवणीयता सहन करने वाले कुल 262 बैक्टीरिया की पहचान की गई जिसमें से 88 बैक्टीरिया को 16 S rRNA जीन सिक्वेसिंग द्वारा पहचान कर अलग किया गया। ऐसे चार बैक्टीरिया के नमूनों को एन बी ए आई एम, मऊ नाथ भंजन केन्द्र में जमा कर दिया गया है। संस्थान द्वारा मछली और शेल मछली संबंधित आंकड़ों पर आधारित एक विशिष्ट प्रोटियोजीनोमिक्स डेटाबेस, फिशप्रोट (FISHPROT) बनाया गया है। साथ ही, देश की दक्षिणी, उत्तरी, पूर्वी और उत्तर–पूर्वी क्षेत्रों के 74 खुला जल क्षेत्रों में 0.2 से 65 प्रतिशत तक उपस्थित विदेशी प्रजातियों की उपलब्धता सूची को बनाया गया है। दो पृथक लक्षण वाले आर्द्रक्षेत्रों में किये गये परीक्षणों से यह पता चलता है कि इन आर्द्रक्षेत्रों की स्थिति का पता इनके एन्जायम संबंधी कार्यकलापों को जैवरसायन सूचक के रूप में प्रयोग कर लगाया जा सकता है।

हिन्दू धर्म को मानने वालों के लिये महाकुंभ मेले में स्नान का विशेष महत्व है। महाकुंभ मेला 2013 के दौरान संस्थान के इलाहाबाद केन्द्र द्वारा अन्य संगठनों की मदद से त्रिवेणी संगम, इलाहाबाद में जल प्रवाह की उपलब्धता को मापा गया और यह देखा गया कि इन लाखों लोगों के स्नान के बाद भी जल की गुणवत्ता में कोई ह्रास नहीं हुआ है। बेसियन बिलीफ नेटवर्क मॉडल से यह तथ्य सामने आया है कि साबरमती ज्वारनदमुख क्षेत्र में पर्यावरणीय प्रदूषण 79.26 प्रतिशत तक है। ज्वारनदमुख के विकास एवं इसकी निरंतरता में मैंग्रोव की एक अभिन्न भूमिका है जिसका कारण इसमें कार्बन तत्व के जमाव के कारण इसकी बायोमास और उपज का अधिक होना है। मणिपुर के आर्द्रक्षेत्रों में परीक्षण से यह तथ्य सामने आया कि आर्थिक तौर पर महत्वपूर्ण प्रजातियों का पेन पालन संभव है। पिंजरा पालन में मछलियों के भोजन में यौगिक तत्वों को मिश्रित करने पर मछलियों का विकास उत्तम होता है।

रिपोर्ट अवधि के दौरान कई शोध पत्र, बुक चैप्टर, बुलेटिन, पैम्फलेट एवं सार ग्रंथों का प्रकाशन किया गया है। इस दौरान 12 प्रशिक्षण एवं 5 जन जागरूक कार्यक्रमों का आयोजन हुआ। कुछ सिफरी सदस्यों को फेलोशिप, पीएच डी डिग्री और डी बी टी विदेशी एशोसियेट उपाधि से सम्मानित किया गया। हम उन सभी सदस्यों को बधाई देते हैं। कुल 13 अधिकारी व कर्मचारी सेवानिवृत्त हुये जिनमें दो प्रभागाध्यक्ष थे। मैं उन सभी को हार्दिक शुभकामनायें देता हूँ और उनके खुशहाल जीवन के लिये ईश्वर से प्रार्थना करता हूँ। मैं संस्थान के नये सदस्यों का स्वागत करता हूँ एवं उनके सुनहरे भविष्य की कामना करता हूँ। मैं संस्थान के कुशल सहायक कर्मचारी, श्री सत्यब्रत बैनर्जी की दिनांक 14 जनवरी, 2013 को आकस्मिक मृत्यु पर गहरा शोक व्यक्त करता हूँ। ईश्वर! उनकी आत्मा को शांति प्रदान करें।

प्रस्तुत न्यूजलेटर को और भी उपयोगी एवं आकर्षक बनाने हेतु आपके सुझाव आमंत्रित हैं।

बैरकपुर
अगस्त, 2013

अनिल प्रकाश शर्मा

अनुसंधान उपलब्धियाँ

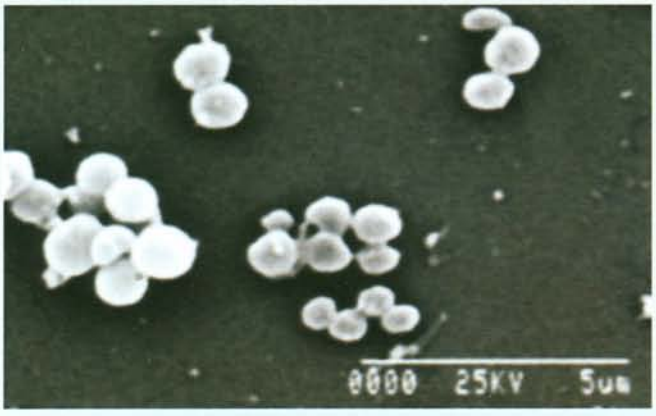
फेनोल प्रभाव को कम करने वाली बैक्टीरिया को जीनोम सिक्वेन्सिंग

बायोसेफ्टि एक ऐसी तकनीक है जिसमें नदीय क्षेत्र में बायोरिमेडिएशन के लिये फेनोल के प्रभाव को कम करने वाले बैक्टीरिया का प्रयोग किया जाता है। ऐसे बैक्टीरिया का प्रयोग रसायनों के प्रभाव को भी कम करते हैं। इस प्रक्रिया में फेनोल के प्रभाव को कम करने वाली दो बैक्टीरिया, *Bacillus subtilis* (strain Hala) और *Ochrobacterium anthropi* (strainPCP60a) का सिक्वेंसिंग इलुमिना प्लेटफार्म पर किया गया। इस संपूर्ण जीनोम प्रक्रिया को RAST सर्वर द्वारा विश्लेषण कर अत्यावश्यक जीन की पहचान की गई है। इस प्रक्रिया से रसायनों के घातक प्रभाव को कम करने वाली जीन की पहचान की गई जो निम्नलिखित क्रिया में सहायक हैं – glutathione आधारित कुछ जीन हैं – formaldehyde detoxification, salicylate ester degradation, toluene degradation, quinate degradation, Benzoate degradation, p-hydroxybenzoate degradation, chloroaromatic degradation pathway, catechol branch of beta-ketoadipate pathway, salicylate and gentisate catabolism, protocatechuate – इन सभी जीन का प्रदूषण को कम करने में अभिन्न भूमिका है। *Bacillus subtilis* जीन के स्ट्रेन में रसायनिक प्रदूषण को कम करने की क्षमता होती है।

एस के मन्ना, एस सामन्ता, एस के नाग, मो. अफ्ताबुद्दीन, पी मौर्य एवं एस दास

जल, तलछट और लवणीय क्रिस्टल में पायी जाने वाली बैक्टीरिया का लवण सहनता

खुला जल क्षेत्रों में लवणीयता सहन करने वाली बैक्टीरिया की पहचान कर उनका अलग करना एक महत्वपूर्ण कार्य है इससे विभिन्न फसलों एवं मत्स्य प्रजातियों की लवण सहनता में सुधार के साथ पर्यावरण में उपस्थित लवणीयता भी कम होती है। पश्चिम बंगाल, उड़ीसा और आंध्र प्रदेश के जल, तलछट और लवणीय क्रिस्टल में पायी जाने वाली कुल 262 लवणीयता सहन करने वाली बैक्टीरिया की पहचान की गई है जिसमें से 88 बैक्टीरिया को 16 तत्छ। जीन सिक्वेंसिंग आधारित मोलेक्युलर टूल से पहचान की गई। इन बैक्टीरिया की संरचना अध्ययन के लिये 12 हैलोबैक्टीरिया की पहचान की गई। इनकी भौतिक संरचना के अध्ययन हेतु कुछ सूक्ष्मजीवी को 30 सोडियम क्लोराइड के 30 प्रतिशत, 25 प्रतिशत, 20 प्रतिशत, 15 प्रतिशत और 10 प्रतिशत वाले घोल में रखा गया और ऐसे सूक्ष्मजीवी क्रमशः 1, 8, 25, 52, 240 और 245 प्राप्त हुये। संपूर्ण ट्रांसक्रिपटोम विश्लेषण से की *Staphylococcus epidermidis* 324 जीन (20 प्रतिशत लवणीयता सहन करने वाली) और *Staphylococcus epidermidis* की 931 जीन की पहचान की गई। ऐसे चार बैक्टीरिया (*Bacillus cereus, Serratia rubidaea, Pseudomonas aeruginosa* और *Pseudomonas stutzeri*) को नेशनल ब्युरो ऑफ एग्रीकल्चरली इंपोर्टेन्ट माइक्रोऑर्गेनिजम्स, मउ में जमा कर दिया गया है।



बी के बेहरा और डी के मीणा

फिशप्रोट डेटाबेस का विकास

संस्थान ने फिश प्रोटियोमिक्स पर वेब आधारित डेटाबेस, फिशप्रोट सॉफ्टवेयर का विकास किया है। यह सॉफ्टवेयर एक फिश प्रोटियोमिक डेटाबेस है जिसका प्रयोग जैव सूचकों की पहचान एवं उनका मूल्यांकन करना है। इसे विशेष रूप से मछली और शेल मछली के प्रोटियोजीनोमिक्स को ध्यान में रख कर बनाया गया है। अभी इस डेटाबेस में भारतीय मेजर कार्प, कतला कतला का मांसपेशी प्रोटियोम; नदीय कैटफिश, रीता रीता का लेंस प्रोटियोम; मरेल प्रजाति, चन्ना स्ट्रियेटस का लीवर प्रोटियोम और भारतीय मेजर कार्प, लेबियो रोहिता की मांसपेशी का प्लाज्मा प्रोटियोम संबंधी जानकारी दी गई है। इस वेब आधारित डेटाबेस को अन्य महत्वपूर्ण राष्ट्रीय और अंतर्राष्ट्रीय प्रोटियोमिक्स और जैवसूचना स्रोत जैसे, NCBI, SWISSPROT और प्रोटियोमिक्स संगठन जैसे SPS, BSPR एवं PSI इत्यादि से लिंक किया गया है। इस डेटाबेस को प्रयोग हेतु आधिकारिक तौर पर संस्थान के निदेशक, प्रोफेसर ए पी शर्मा द्वारा 29 मई 2013 को लॉन्च किया गया। इस डेटाबेस लिंक (http://www.cifri.ernet.in/fishprot.html) को संस्थान के वेबसाइट से प्राप्त किया जा सकता है।

बी पी मोहान्ति एवं डी करूणाकरन ए पी शर्मा

अंर्तस्थलीय खुला जल क्षेत्रों की विदेशी मत्स्य प्रजातियों का प्रलेखन

अंर्तस्थलीय खुला जल क्षेत्रों में उपस्थित विदेशी प्रजातियों के कारण देशी प्रजातियों की अतिजीविता पर पड़ता है। देश के चयनित नदियों, ज्वारनदमुखों, जलाशयों और आर्द्रक्षेत्रों के सर्वेक्षण से प्राप्त आंकड़ें यह बताते हैं कि इनमें 15 विदेशी प्रजातियां और 10 आहार उपयोगी प्रजातियां (*Hypophthalmichthys molitrix, H. nobilis, Ctenopharyngodon idella, Cyprinus carpio, Barbonymus gonionotus, Systomus tetrazona, Oreochromis niloticus niloticus, O. mossambicus, Clarias gariepinus, Piaractus brachypomus, Osphronemus sp.*) और 4 आहार अनुपयोगी प्रजातियां (*Pterygoplechthys disgunctivus, P.pardalis, Gambusia affinis, Barbonymus altu*) उपलब्ध हैं। देश के दक्षिणी, उत्तरी, पूर्वी और उत्तर–पूर्वी राज्यों की 74 खुला जल क्षेत्रों में विदेशी प्रजातियों की उपस्थिति इंडेक्स इनकी उपलब्धता 0.2 से 65 प्रतिशत तक बताते हैं। इलाहाबाद में गंगा और यमुना नदियों में उपलब्ध विदेशी प्रजातियां हैं, *Oreochromis niloticus, Cyprinus carpio, Hypophthalmichthys molitrix, Hypophthalmichths nobilis, Ctenopharyngodon idella* और *Clarias gariepinus* जो कुल उपज का 65 प्रतिशत हैं। इलाहाबाद क्षेत्र में कॉमन कार्प और तिलापिया मछलियों के अण्डें पाये गये हैं। पूर्वी कोलकाता के आर्द्रक्षेत्रों में गहन एवं पालन आधारित मत्स्य कृषि के दौरान कुल उत्पादन का 55–65 प्रतिशत विदेशी प्रजातियों को देखा गया। त्रिपुरा के डुम्बुर जलाशय में कॉमन कार्प, *Cyprinus carpio* जो एक विदेशी प्रजाति है, की उपलब्धता नगण्य (0.5 प्रतिशत) थी।

वी आर सुरेश, बी सी झा, के डी जोशी, सोना येंगकोपम, एफ खान, प्रीथा पनिक्कर एवं अंजना एक्का, डी के बीश्वास, एस साहा, एस दास, उआइ आली, एम इ विजयकुमार, के के शर्मा और ए काकाति

तलछट एनजायम एवं जैव रसायनिक प्राचलों से अपरद आधारित एवं प्राकृतिक आर्द्रक्षेत्रों में पार्थक्य

आर्द्रक्षेत्रों का सही नियंत्रण पारिस्थितिकी एवं जलग्रहण क्षेत्र की पोषकता पर निर्भर करता है। इसके लिये आर्द्रक्षेत्र की पारिस्थितिकी स्वास्थ्य सूचकों की पहचान एवं इनका मानकीकरण करना है जिसमें तलछट जैवरसायन की महत्वपूर्ण भूमिका है। अपरद सिंचित आर्द्रक्षेत्र (झगरासिसा) एवं प्राकृतिक आर्द्रक्षेत्र (खलसी) दोनों की पारिस्थितिकी और पोषकता अलग–अलग हैं। दोनों आर्दक्षेत्रों की तलछट में उपस्थित जैव तत्व अलग–अलग हैं जैसे, खलसी में जैव तत्व एवं कार्बन तत्व झगरासिसा से अधिक पाये गये पर तलछट फॉस्फोरस झगरासिसा में अधिक, 9.1 प्रतिशत था और खलसी में 8 प्रतिशत था। हेटरोट्रोफिक बैक्टीरिया खलसी मे 13 गुणा अधिक थे जबकि दोनों आर्द्रक्षेत्रों में फॉस्फेटोज उत्पन्न करने वाले बैक्टीरिया की उपस्थिति में अधिक अंतर नहीं था। खलसी में β-glucosidase की सक्रियता अधिक था। अम्लीय फॉस्फेटोज और क्षारीय फॉस्फेटोज खलसी में झगरासिसा से 3–4 गुणा अधिक थे। एन्जायम भिन्नता को दोनों आर्द्रक्षेत्रों की स्थिति की आंकलन में जैवरसायन सूचक के रूप में उपयोग में लाया जा सकता है।

मो. अफ्ताबुद्दीन एवं एम ए हसन

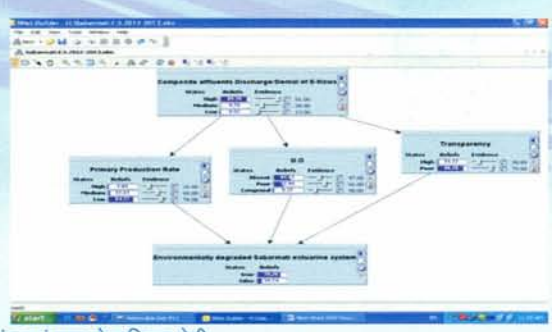
महाकुंभ के दौरान त्रिवेणी संगम के जलप्रवाह का आंकलन

विश्व वन्य जीव निधि, भारत; केन्द्रीय अंतर्स्थलीय मात्स्यिकी अनुसंधान संस्थान, इलाहाबाद; आइ आइ टी, कानपुर और पीपल्स साइंस इन्सिट्युट, देहारदून के सम्मिलित प्रयास से महाकुंभ के दौरान (14 जनवरी से 10 मार्च 2013) इलाहाबाद के त्रिवेणी संगम पर पर्यावरणीय प्रवाह का आंकलन किया गया। लोगों के स्नान के अलावा जलीय जीवों के के लिये भी जलप्रवाह का पर्याप्त होना आवश्यक है। उपर्युक्त संगठनों के जैवविविधता विशेषज्ञ दल ने बिल्डिंग ब्लॉक मेथोडोलॉजी द्वारा जलप्रवाह की आवश्यकता पर जोर दिया है। प्रक्षेत्र संदर्शन, गौण आंकड़ें एवं विशेषज्ञों के अनुसार जल की गहराई 1.5 मी. तक होना चाहिये। पर वास्तविकता में जल सतह की चौड़ाई 325 मी. और आंकलित जलप्रवाह 310 क्युसेक (10,950 क्युसेक) था। विशेषज्ञों के अध्ययन के आध्धर पर त्रिवुणी संगम पर स्नान करने वाले लोगों पर इसके प्रभाव का आंकलन किया जा रहा है। महाकुभ 2013 से पहले और बाद के समय के दौरान गंगा–यमुना के 7 सैंपलिंग क्षेत्रों के जल का विश्लेषण किया गया है पर इससे कोई विशेष परिणाम प्राप्त नहीं हुआ जिसका कारण अणिक जलप्रवाह का होना है।

के डी जोशी, एस एस मिश्रा, बी के सिंह, डी एन झा एवं एम ए आलम

साबरमती ज्वारनदमुख में बेसियन बिलीफ नेटवर्क मॉडल का प्रयोग

भारत में ज्वारनदमुख संसाधन क्षेत्र 2.7 मिलियन हे. है जो अत्यन्त महत्वपूर्ण हैं। पर बांध निर्माण, बहिःस्राव के कारण ज्वारनदमुखों के लिये हानिकारक है। वर्तमान अध्ययन में साबरमती ज्वारनदमुख का बेसियन बिलीफ नेटवर्क मॉडल के द्वारा इसके जैव एवं अजैव कारको के आधार पर आंकलन किया गया। इस मॉडल का विकास बहिःस्राव एवं पर्यावरणीय प्रवाह के आधार पर किया गया जिससे ज्वारनदमुख में हुये पर्यावरणीय ह्रास का अनुमान किया जा सके एव इस ज्वारनदमुख की पारदर्शिता, घुलित ऑक्सीजन एवं प्रारंभिक उत्पादन को हानि पहुंचाने वाले कारकों का पता चले। इस मॉडल से प्राप्त परिणाम लगभग 76.78 प्रतिशत सत्य सिद्ध हुये हैं। प्राप्त परिणाम यह बताते हैं कि साबरमती ज्वारनदमुख में पर्यावरणीय ह्रास 79.26 प्रतिशत हुआ है।



एस एन सिंह एवं एस मोनालिसा देवी

मणिपुर आर्दक्षेत्र में पेन पालन की संभावना हेतु अध्ययन

मणिपुर के विष्णुपुर जिले के ताकमू पाट में मात्स्यिकी निदेशालय, मणिपुर सरकार के सहयोग से पेन पालन का प्रदर्शन किया गया। यहां पेन पालन की संभावना का पता लगाने के लिये लगातार 180 दिन तक पेन पालन किया गया। इसके लिये 0.1 हे. क्षेत्र में नाइलोन जाल (25 मि.मी जाल छिद्र वाली) से पेन लगाया गया। इस जाल को 1.5 मीटर के अंतराल पर बांस के बल्लों के सहारे पेन को स्थापित किया गया। इस पेन में मेजर कार्प प्रजातियों, माइनर कार्प, pengba (*Osteobrama belangeri*) एवं विदेशी कार्प प्रजातियों का संग्रहण (5 अंगुलिकाये प्रति वर्ग मीं. की दर से) किया गया। संग्रहित मछलियों को पैलेट चारा (23.4 प्रतिशत प्रोटीन वाली) उनकी शारीरिक भार का 5 प्रतिशत तक दिन मे दो बार दिया गया। चमदहइं का औसत शारीरिक विकास 1107.55±2.92 हुआ। इसके बाद ग्रास कार्प (785.42±53.21), कतला (738.82±16.78), मृगल (323.39±7.6), रोहू (251.19±6.97), कॉमन कार्प (191.08±4.88) और सिल्वर कार्प (123.01±4.6) आते हैं। इसी प्रकार, विशिष्ट विकास दर सबसे अधिक चमदहइं का (1.38) और सबसे कम सिल्वर कार्प (0.45) था। इससे मणिपुर के पाटों में अधिक मांग वाली देशी मानर कार्प प्रजाति, *O. belangeri* के पेन पालन की संभावना का पता चलता है। साथ ही, यहाँ ग्रास कार्प और कतला का पेन पालन भी किया जा सकता है। लाभ–लागत अनुपात 1.29 प्राप्त किया गया। इस प्रदर्शन में अधिक मांग वाली स्थानीय प्रजातियों का पेन पालन की संभावना को पता चलता है।

बी के भट्टाचार्य, डी देबनाथ, सोना येंगकोकपम, ए के यादव, पी दास एवं के के सर्मा

जलाशयों में पिंजरा पालन में मछलियों के भोजन में यौगिक तत्वों का समावेश

मेजर कार्प प्रजातियों के पिंजरा पालन से भोजन की उपयोगिता और विकास दर को कम करता है। अतः प्रोबायोटिक्स और आकर्षित करने वाले यौगिक तत्वों को मिलाने से मछलियों को खुराक बढ़ता है। मछलियो के विकास दर पर प्रतिकूल प्रभाव डालने वाले अन्य कारकों का भी अध्ययन किया गया है। इसके लिये तीन प्रकार के भोजन को तैयार किया गया – प्रथम, प्रोबायोटिक्स और आकर्षित करने वाले तत्वों से युक्त (डी 1), द्वितीय, प्रोबायोटिक्स, आकर्षित करने वाले तत्व और तनाव खतम करने तत्वों से युक्त (डी 2) और तृतीय ऐसा भोजन जो प्रोबायोटिक्स, आकर्षित करने वाले तत्व और तनाव खतम करने तत्वों से रहित (आर डी)। इन तीनों प्रकार के भोजन को मछलियों के अलग–अलग वर्गों को 45 दिनों तक दिया गया। प्रोबायोटिक्स और आकर्षित करने वाले तत्वों से युक्त भोजन ग्रहण करने वाले मछलियों का विकास केवल 5 प्रतिशत हुआ जबकि प्रोबायोटिक्स, आकर्षित करने वाले तत्व और तनाव खतम करने तत्वों से युक्त भोजन ग्रहण करने वाले मछलियों का विकास 58 प्रतिशत हुआ। मछलियों के हड्डियों का अध्ययन यह बताता है कि डी 1, डी 2 और आर डी में क्रमशः अशोषित प्रोटीन अधिक है और अशोधित लिपिड की मात्रा कम है। इसी प्रकार, प्रोबायोटिक्स और आकर्षित करने वाले तत्वो से युक्त भोजन करने करने मछलियों का एफ सी आर उननत पाया गया।

मो. अफ्ताबुद्दीन, एम ए हसन एवं डी के मीणा