

सिफरी समाचार CIFRINEWS

(January - June 2024)



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13th INDIAN FISHERIES & AQUACULTURE FORUM Fostering Indian Fisheries and Aquaculture for Attaining Sustainable Development Goals 23-25 February 2024 • Kolkata, West Bengal



Inaugural session of 13th Indian Fisheries and Aquaculture Forum



Hon'ble Minister-in-Charge, Fisheries, Govt of WB visiting the Hilsa rearing ponds at Kolaghat, WB



DG (ICAR) along with the DDG (Fy. Sc.) interacting with the institute staff

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ICAR-CENTRAL INLAND FISHERIES RESEARCH INSTITUTE

(An ISO 9001 : 2015 Certified Organisation)

Barrackpore, Kolkata - 700 120

Director's Column



In collaboration with the Inland Fisheries Society of India, Asian Fisheries Society Indian Branch and Professional Fisheries Graduates Forum (PFGF), we organized the 13th Indian Fisheries and Aquaculture Forum (IFAF) during 21-23 February 2024 at the Biswa Bangla Convention Centre, Kolkata. With a theme of "Fostering growth of fisheries and aquaculture for sustainable development", the forum covered a wide range of topics under 13 themes and several sub-themes, besides 4 satellite symposia and five conclaves. About 1500 delegates from India and abroad attended the programme which was inaugurated by Shri

Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry and Dairying, Government of India. We are thankful to Dr. Himanshu Pathak, Secretary, DARE and DG, ICAR and Dr. Joykrushna Jena, DDG (Fy. Sci.) for their kind presence in the conference. The conference was a huge success.

It is a matter of great pleasure in informing you that we have successfully bred hilsa using cryopreserved milt collected from the wild. During the recent monitoring, a hilsa fish reached 689 g (43.6 cm) size at Kolaghat, which is gained during rearing of 3 years. We are successful in getting one patent for 'Vertical slab gel electrophoresis'. I congratulate the concerned scientists. Besides, one trademark and six copy rights have also been registered. Non-exclusive license for 'CIFRI Fish Tanavhari' for a period of five years for the manufacturing and sale of in the territory of India was granted to M/s. Glaucus Agrochem Pvt. Ltd.

The Institute identified a new fish species, *Opsarius siangi*, in the Siang River of Arunachal Pradesh. The whole genome

size was estimated for *M. cavasius* and *M. gulio*. These species were also subjected to genetic stock characterization. A highly invasive species, *Pterygoplichthys disjunctivus* was recorded in the Deepor beel for the first time, which is a concern. Indiscriminate use of pesticides for fishing in the River Ganga is also a grave concern. The Institute have been relentlessly trying to restore the biodiversity of fish species, particularly IMC in the River Ganga through ranching and awareness for the last couple of years. In this direction, we have conducted 18 ranching programmes in which 31.16 lakh fingerlings were released into the river Ganga.

I welcome the newly joined Adm. Officer and 12 Technical trainees. I congratulate all the staff who got promoted and also got awards/recognitions for the institute. I wish a happy and healthy retired life to all the 3 staff who got superannuated during this period. I invite suggestions from the learned readers to improve the institute newsletter.

Dr. B. K. Das
Director

August 2024

About ICAR-CIFRI

Started as Central Inland Fisheries Research Station in March, 1947 at Barrackpore, West Bengal, ICAR-CIFRI has carved a niche in inland fisheries research. Induced fish breeding, composite fish culture and other scientific fish production practices developed during the sixties by the Institute contributed to the nation's blue revolution. Reservoirs and wetland fisheries management technologies developed and disseminated by the

institute resulted in enhanced fish production from these resources. By the turn of the year 2000, the research and development agenda of the Institute concerning inland open waters shifted from fish as the only benefit to ecosystem health and ecological benefits with emphasis on sustainability, livelihood and nutritional security. In addition to the Headquarters at Barrackpore and research station at Kochi, ICAR-CIFRI has four Regional Research Centres at Allahabad,

Guwahati, Bengaluru and Vadodara, through which the issues of inland open water fisheries are being addressed.



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13th Indian Fisheries and Aquaculture Forum

"Fostering growth of fisheries and aquaculture for sustainable development"

The Institute, in collaboration with the Inland Fisheries Society of India, Asian Fisheries Society Indian Branch and Professional Fisheries Graduates Forum (PFGF), organized the 13th Indian Fisheries and Aquaculture Forum (IFAF) during 21-23 February 2024 at the Biswa Bangla Convention Centre, Kolkata with the theme of "Fostering growth of fisheries and aquaculture for sustainable development". Covering a wide range of topics including open water fisheries resource management, innovations in aquaculture, sustainable small-scale fisheries, advances in fish nutrition, fish health management, post-harvest technology, value addition, emerging contaminants, precision farming, biotechnological interventions, fisheries extension governance, and policies, the conference highlighted recent advances in the fisheries and aquaculture sector aligned with the Sustainable Development Goals set by the United Nations. There were 13 themed sessions with many sub-themed sessions, four satellite symposia and five conclaves.



Hon'ble Minister of Fisheries, Animal Husbandry and Dairying, Government of India addressing the audience

Around 1500 delegates from India and abroad including galaxy of scientists, entrepreneurs, fishers, fish farmers, scholars, government officials, industrialists and students attended the inaugural programme of the conference. The event was inaugurated by Shri Parshottam Rupala, Hon'ble Minister of Fisheries, Animal Husbandry and Dairying, Government of India in the august presence of Dr. Himanshu Pathak, Secretary, DARE and DG, ICAR, Dr. Joykrushna Jena, DDG (Fy. Sci.), ICAR, Dr. C. N. Ravishankar, Director & Vice Chancellor, ICAR-CIFE and Dr. B. K. Das, Director, ICAR-CIFRI.

The Hon'ble Minister urged all the stakeholders including researchers, government officials, farmers, industry



Dr. J. K. Jena delivering inaugural lecture

representatives, civil society organizations, and students to unite in the country's efforts towards increasing production and maintaining sustainability in fisheries and aquaculture sector. The DG (ICAR) stressed on nature-friendly, climate resilient and profit making fisheries sector with the introduction of genetically improved species, smart and precise practices, proper regulatory mechanism and skill development. On this occasion, various awards of national importance such as Prof. H.P.C. Shetty Award, Professors T. J. Pandian & A. J. Matty Award, Dr. T.V.R. Pillai Award, Dr. M. C. Nandeesh Award, Shri J.V.H. Dixitulu National Award, IFSI fellows, AFSIB Young Scientist Awards and awards to industrial partners were presented by the Hon'ble minister.

The Key-note address on "Fisheries higher education for Viksit Bharat" was delivered by Dr. C. N. Ravishankar, while Dr. V. R.



Dr. B. K. Das welcoming the dignitaries and delegates



DG (ICAR) delivering his speech

program launch workshop for the BIMSTEC-India Marine Research Network (BIMReN) was also held on 23 February alongside the Forum. The plenary-cum-vaedictory programme was graced by Dr. J. K. Jena.

P. Sinha Memorial Lecture on “Aquaculture development in India: R&D perspectives for attaining SDGs” was delivered by Dr. J. K. Jena. Dr. K. Riji John, the Former VC, KUFOS, Kochi delivered the Dr. S. D. Tripathy Memorial Lecture on “Viral diseases in aquaculture – Indian perspective”.

Four satellite symposia viz. *Fish genetic resources and conservation, Sustainable fisheries and aquaculture in Northeast India, Riverine fisheries, habitat mapping, and environmental Health, Natural Farming* were also organized under the forum. The titles of the five conclaves were *Industry conclave, Women empowerment in fisheries, Farmers conclave, Department of Fisheries (DoF) conclave and Student interface meet*. The



Hon'ble Minister unveiling the ICAR-CIFRI products



Hon'ble Minister at the ICAR-CIFRI stall

cultivation, developing nutraceuticals and therapeutics from aquatic plants and animals, development of national brood bank, satellite hatcheries and nurseries, promotion of cluster approaches in farming, creation of value chains, promotion of natural farming are some of the recommendations of the conference.

Exploring fish production from all the available water resources- including newly excavated Amrit Sarovars, establishing National Fish Coordination Committee (NFCC), reduction of post-harvest losses, quality seed production, development of easy seed transport mechanisms, diversification of fish species and culture techniques including enclosure culture of high value fish species, maintaining water quality, reduce disease loss, higher use of unconventional feed resources, addressing the environmental degradation in fish/shrimp production systems, management of illegal, unreported and unregulated (IUU) marine fishing, managing the bycatch and juvenile catch, regional conflicts and cross-border fishing, climate change impacts, anthropogenic interface, tapping the sea weed



A section of the delegates



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Secretary, DARE and DG (ICAR) visited the institute and inaugurated the National Ranching Programme 3.0



DG (ICAR) addressing the institute staff

Dr. Himanshu Pathak, Secretary DARE, and DG, ICAR visited ICAR-CIFRI, Barrackpore on 19 January 2024, and inaugurated the 3rd Phase of National Ranching Programme under the 'Namami Gange' at Seoraphuli Ghat, Barrackpore. Dr. J. K. Jena, DDG (Fisheries Science) also accompanied him. The ranching programme aimed at enhancement of stock in open water resources and is vital for the restoration, conservation, and upliftment of this declining fish fauna. In the 2nd Phase of NMCG, about 63.5 lakh advanced fingerlings were released in the river Ganga. Dr. Pathak released 50,000 advanced fingerlings of Indian Major Carps at the river Ganga. He also inaugurated the experimental boat 'Matsyikimanthan' and newly constructed 3rd floor of the main building. Afterwards, he addressed the staff of ICAR-CIFRI and elaborated the vision of ICAR in the context of Viksit Bharat.



Inauguration of 3rd phase of National ranching programme



Inauguration of the experimental boat



Inauguration of the 3rd floor of the main building



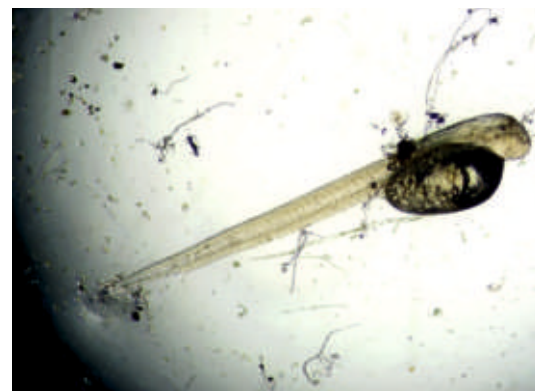
DDG (Fy. Sc.) addressing the institute staff

Research Highlights

Successful breeding of hilsa using cryopreserved milt

ICAR-CIFRI successfully bred hilsa using cryopreserved milt collected from the wild. There is a difficulty in getting both male and female at the same time from the wild, so cryopreservation of milt and genebank development of this species are needed. The institute has been working for the past ten years to establish the life cycle of hilsa in captive conditions in collaboration with other ICAR fisheries institutes. The technology is first of its kind for hilsa breeding. The study brings hope that conservation aquaculture initiatives will soon make it possible for captive rearing and induced breeding in order to address the issue of low availability of hilsa.

S. Samanta, S. Roy, R. Chakraborty, S. Maity, R. K. Manna, A. K. Sahoo and B. K. Das



46 hrs old hatchlings of Hilsa

Captively reared hilsa attained 689 g (43.6 cm) in pond in 3 years – a better growth than rivers!



Hilsa weighing 689 gm harvested from Kolaghat farm



Pond reared Hilsa

Juveniles of Hilsa were reared in ponds at various locations, like the freshwater zone at Rahara (ICAR-CIFA), the brackishwater zone at Kakdwip (ICAR-CIBA), and the intermediate zone at Jamitya village in Kolaghat, Midnapur East, West Bengal (ICAR-CIFRI). The broodstock ponds are fed with water from River Rupnarayana, a tributary of the Ganga at Kolaghat. Good growth and survival were recorded at all the two pond

culture facilities there. During recent monitoring, a fish of 689 g (43.6 cm) was recorded at Kolaghat, which is gained during rearing of 3 years.

S. Samanta, R. K. Manna, R. Chakraborty, S. Maity, A. K. Sahoo and B. K. Das

Opsarius siangi, a new fish species from the Brahmaputra drainage, India

The Institute identified a new fish species from the Siang River of Arunachal Pradesh. Classical taxonomy combined with a molecular approach, such as species delimitation, molecular phylogeny, and genetic divergence based on the COI gene, identified the species as a putative new species named *Opsarius siangi* (<https://doi.org/10.1080/24701394.2024.2310279>). This newly described species is distinguished by a suite of unique morphological characteristics, including a complete lateral line consisting of 65–77 scales, 32–39 pre-dorsal scales, 12–15 scales positioned between dorsal fin origin and lateral line, the presence of two pairs of barbels, body depth ranging from 18.80% to 27.42% of standard length, and a distinct pattern of 8–15 vertical bars adorning the body. This description enriches our understanding of biodiversity within the Siang River ecosystem.



Opsarius siangi sp. nov., (Holotype, ZSI FF 9339, 91.84 mm SL)

K. Kumari, S. Borah, S. M. Nair and V. R. Suresh



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Indigenous fishing crafts and gears of the Narmada River

An exploratory survey across the upper and middle stretches of the river Narmada in Madhya Pradesh by the institute revealed various fishing crafts operated in the river. These included wooden boats (plank built and dug out) locally known as *Donga* or *naav*, tin/aluminium boats (locally known as *Kisti*), and inflated tyre tubes. Tube fishing was mainly observed in the middle stretch of the river Narmada in Madhya Pradesh. These fishing crafts are primarily used for the gill net operation. Fishing gears commonly used in the River Narmada includes gill nets, trammel nets, cast nets, drag nets, scoop nets, hooks and line (locally known as *Gul*) and iron traps (locally known as *Komna*). Catch per unit effort (CPUE) from all the fishing methods varied from 0.25 to 7.5 kg/fisher/day during the survey. The most dominant species in the fish catch include *Rita rita*, *Clupisoma garua*, *Tor putitora*, *T. tor*, *Systemus sarana*, *Labeo dyocheilus*, *L. boggut*, *L. boga* and *L. gonius*.



Wooden boat (*Donga*)



Inflated tyre tube



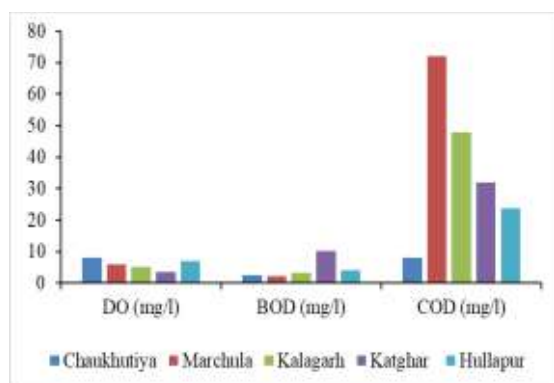
Fishing bamboo trap (*Komna*)



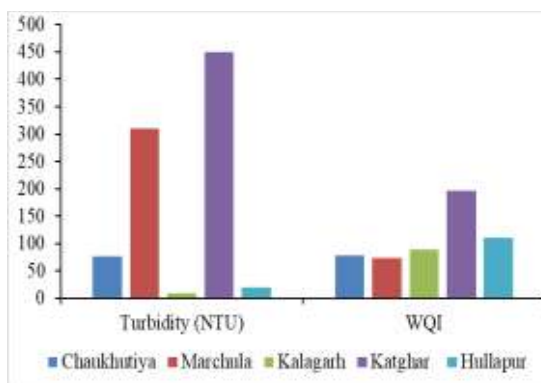
Tin/ Aluminum boats (*Kisti*)

C. Johnson, D. Bhakta, P. Gogoi, M. H. Ramteke, S. K. Manna, S. Kamble and B. K. Das

Water quality assessment during the summer season in Ramganga River, India



DO, BOD, and COD values of Ramganga



Turbidity and WQI values of Ramganga

The Ramganga, a spring-fed river that rises in Dudhatoli in Uttarakhand's central Himalaya and empties into the Ganges in Farrukhabad, Uttar Pradesh, is a tributary of the river Ganga. Hydrological sampling of this river was carried out in May 2024. Vital water quality parameters such as water temperature, pH, dissolved oxygen, TDS, electric conductivity, BOD, and COD varied from 21.7 to 29.7 °C, 7.7 to

9.0, 3.6 to 8.2 mg/l, 135 to 369 mg/l, 177.5 to 519 µ/cm, 2.2 to 10.2 mg/l, and 8 to 72 mg/l, respectively. The turbidity ranged from 9.46 (Kalagarh) to 450 NTU (Katghar), which is above the recommended limit of 5 NTU drinking water guidelines (BIS, 2012). The enormous quantity of eroded soil runoff released into the river systems was the cause of the high turbidity. Alkalinity and hardness ranged from 84 to 240 mg/l and 84 to 144 mg/l, respectively. Total phosphorus and total nitrogen ranged from 0.58 to 2.31 mg/l and 0.003 to 2.13 mg/l, respectively. The Katghar (Moradabad) site had the highest values of most of the investigated water quality variables, while the Marchula site had the lowest values. Water quality in mountainous areas (Chaukhutiya and Marchula) was in good condition, while the quality of water deteriorated at the river's plain stretch due to the various point and non-point sources of pollution. WQI indicated that the water quality of Ramganga was poor to unsuitable for drinking purposes.

B. K. Das, N. A. Pargi, S. Kumar, U. Singh, D. K. Verma, R. A. Bhat, A. Patel, S. Kumar, V. Kumar, A. Alam, V. R. Thakur, J. Kumar and D. N. Jha

Mass occurrence of Bengal whipray at lower stretch of Hooghly-Matlah estuary

A mass occurrence of Bengal whipray in the Bakkhali region of the Hooghly-Matlah estuary during the winter months, in both bagnet and shore seine net catch revealed the presence of *Brevitrygon walga* (Müller & Henle, 1841). Bengal whiprays come under the order Myliobatiformes and family Dasyatidae and are inhabited in marine and brackish water. They are tropical marine demersal fish species which enters brackish waters also. The species is found in the Indian Ocean, from Bangladesh to Myanmar (east of Bok Ye-gan) and eastern India (Bay of Bengal, Tamil Nadu). The species is recognized by its disc-shaped to sub-oval, deeply depressed, broadly rounded pectoral fin tip, severely angular and elongated snout, and small, non-protruding eye. The whip-like tail often has two effective stings. When fresh, the disc's dorsal surface and pelvic fins are both uniformly brownish or tan, its outer fringe is slightly paler brown, and its tail resembles a disk with a dusky distal half. This species seems to be widespread in intertidal zones and other seas that are less than 40 m deep. According to the local fishermen, elasmobranchs are not targeted species, but they are mainly caught as bycatch or accidental catch. Being euryhaline in nature, the lower part of the Hooghly-Matlah estuary might act as a congenial environment for breeding as well as the nursery ground of the species. As per IUCN Red List Status, *B. walga* is categorized as Near Threatened (NT) and needs enough care to avoid unwanted catch of any kind of whipray.



Bengal whipray

D. Bhakta, B. K. Das, S. Nandi, A. Ray and S. K. Chauhan

Association of Hydroid forest and sea anemones on artificial substrates in Indian Sundarbans: commensalism vs competitive inhibition

a



b



c



a) Sea anemones, b) Hydroid forest,
c) Anemones with substrates

During a recent survey in the Indian Sundarbans, a widely distributed aquatic hydroid forest, dominated by species *Eudendrium californicum* Torrey, 1902, and *Bougainvillia fulva* Agassiz & Mayer, 1899, on different submerged substrates like rope, iron jetty floats and dead tree branches were reported. Besides hydroid forest, the substrate was also observed to be effectively utilized by sea anemone, *Diadumene lineata* (Verrill, 1869), as shelter, breeding, and nursery grounds. Although the species has been recorded from the east coast of India, this study confirmed the presence of *D. lineata* in the Sundarbans Biosphere Reserve (SBR), extending its known distribution and thus an addition to the impressive diversity of nearly 2,000 species here. Maximum density of sea anemone was observed at Kadwip stretch, a zone with moderate salinity of 2.2-10.8 ppt, indicating the importance of the salinity gradient for the estuarine species. It has been noted that hydrozoans initially colonize the submerged ropes or other hard substrates, and the mucus they secrete aids in the adhesion of silt and sand in the substratum, creating a suitable bed for sea anemones to attach and thrive. It seems hydroid forest provides them much-needed safeguard against the possible dislodgement by tidal flow regime in the estuary. However, there were substrates where dense infestation of sea anemones was there without the presence of hydroid, revealing possible competitive inhibition for growth of hydroids by sea anemones.

R. K. Manna, A. Sen, D. Bhakta, S. Mandal, S. M. Nair, A. Sengupta, S. and B. K. Das

Whole genome size estimation of fish species under genus *Mystus*

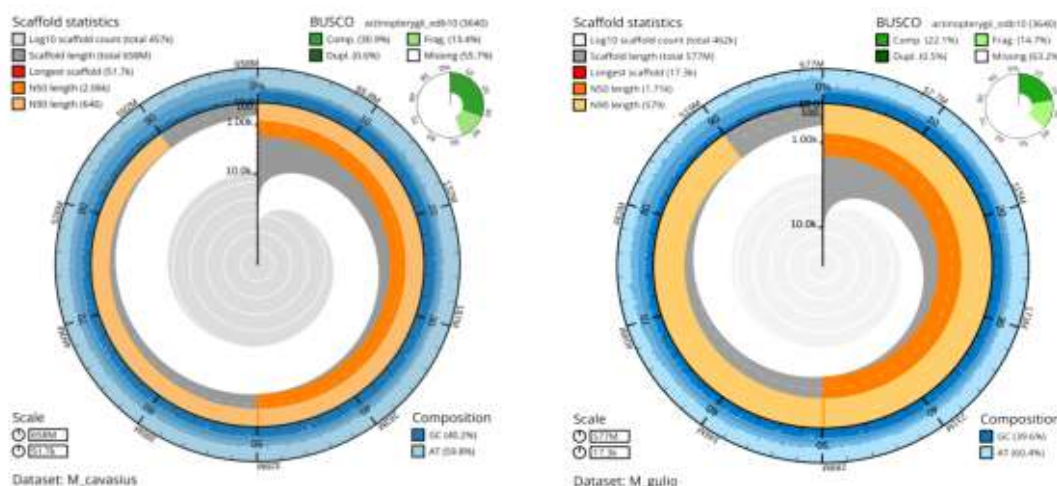
Fish species under genus *Mystus* are popular small indigenous catfishes in the family Bagridae. Establishing a breeding program to enhance economic qualities requires building a reference genome. The structural, functional, organismal, and evolutionary



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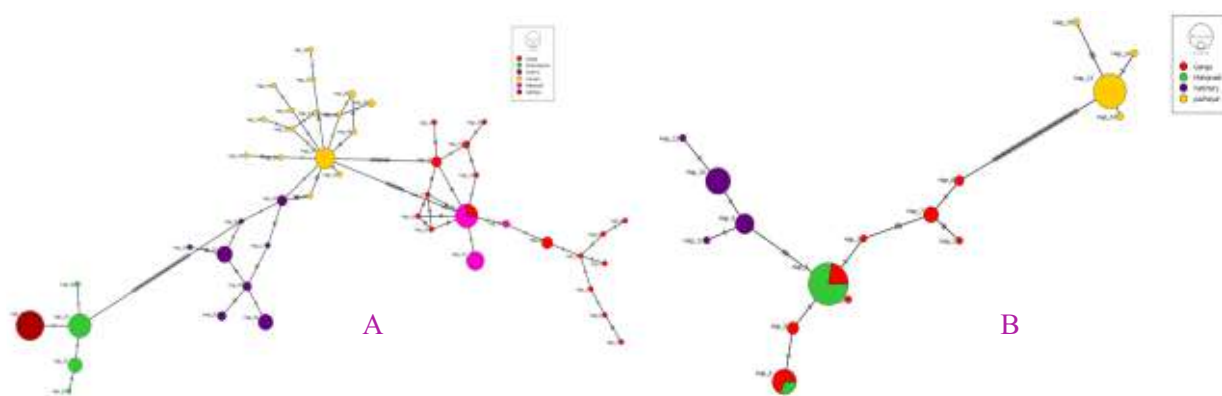
The snailplot shows a summary of the draft genome assembly statistics and the BUSCO scores against Actinopterygii for *M. cavasius* (A) and *M. gulio* (B) respectively

GenomeScope V2, and the draft genome *denovo* assembly was generated using MaSuRCA. In total, 14 GB of Illumina reads of sequencing data were generated in each case. The estimated whole genome size for *M. cavasius* was 0.752 GB and for *M. gulio* 0.665 GB. The BUSCO was used to assess the completeness of the assembled genome.

S. Roy, P. K. Parida, V. Kumar, A. K. Jana, Ramya V. L., D. Bhakta, B. K. Behera and B. K. Das

Genetic stock characterization of the small indigenous catfish, *Mystus cavasius* and *M. gulio*

Two small indigenous catfish species of the Bagridae family, *Mystus cavasius* and *Mystus gulio*, were used to characterize genetic stock. *M. cavasius* samples were collected from the rivers Ganga, Brahmaputra, Mahanadi, Krishna, Cauvery, and from one hatchery. Similarly, *M. gulio* samples were



The median-joining network of *M. cavasius* (A) and *M. gulio* (B) based on haplotypes of the mtDNA cytb region

taken from the rivers Ganga, Mahanadi, Pazhayar, and from a hatchery. A total of 189 sequences of the mitochondrial Cytb gene of *M. cavasius* and 116 sequences of the Cytb gene of *M. gulio* were submitted to NCBI. In the present study, the Cytb region generated 48 haplotypes for the *M. cavasius* population; haplotype diversity (Hd) ranged from 0.488 to 0.935; the highest Hd was observed in the Ganga River. In the case of the *M. gulio* population, the Cytb region generated 16 haplotypes, with Hd ranging from 0.225 to 0.855, the highest number of haplotypes and haplotype diversity observed in the river Ganga, and the Pazhayar population was distinctly related to other populations. Hierarchical gene diversity revealed that a high proportion of the total variance was accredited to among-population variation. The haplotype median-joining network for both *M. cavasius* and *M. gulio* populations based on the Cytb region revealed significant differences in haplotype distributions and frequencies.

S. Roy, P. K. Parida, V. Kumar, A. K. Jana, Ramya V. L., D. Bhakta, S. Borah, N. Sharma, B. K. Behera and B. K. Das

Prospects of enhancing fish yield in Sathanur reservoir, Tamil Nadu through targeted mullet fishery

The fishery of Sathanur Reservoir (area of 2000 ha at full reservoir level), located in Tamil Nadu, was assessed for estimating the catch structure. The commercial catch of the reservoir is dominated by Indian Major Carps as the fishermen practice the targeted fishery for carps using monofilament gillnets of above 180 mm mesh size. The experimental fishing using a multimeshed monofilament gill net in the monsoon season recorded a total of 32 species from the reservoir, of which the mullet *Rhinomugil corsula*, dominated, accounting for 37.5% of the catch. The average length of this species



Fishing at Sathanur dam



Mullets in experimental catch from Sathanur

was recorded at 27.5 ± 2.8 cm and weight 210.8 ± 15.6 g. About 40 fisher families are dependent on this reservoir for their livelihood. Although the mullets are abundant in this reservoir, the fish is not generally targeted in the commercial catch. A targeted mullet fishery could contribute to a higher fish yield, which would help in additional income for improving the livelihood of the fisher community.

Ramya V. L., Jesna P. K., P. Panikkar, S. Sahoo and B. K. Das

Cage culture trials of *Hypophthalmichthys molitrix* (Silver carp) in Mapithel Reservoir



Stocked Silver carp fingerlings in cages



Cages installed in Mapithel reservoir

body weight. Fishes stocked at lower density had higher growth performance than those stocked at higher stocking density. Fishes stocked at 8 and 12 no./m³ reached harvesting size (1 kg) at shorter culture periods, although higher biomass was achieved at higher stocking densities. It can be recommended that initially silver carp fingerlings can be reared at 20 no./m³ for 4 months, after which the stocking density can be reduced to 8 or 12 no./m³ to reduce the culture period.

Cage culture of *Hypophthalmichthys molitrix* (Silver Carp) was carried out in the Mapithel reservoir (Manipur). Four stocking densities, viz., 8, 12, 16, and 20 fingerlings/m³, were tested in triplicate with the participation of local cage farmers. Fingerlings of silver carp having an average weight of 32.45 ± 1.04 g and an average length of 15.3 ± 0.86 cm were used for the study. Individual cage dimensions of 6 x 6 x 4 m³ with an effective water volume of 126 m³ were tested in triplicate. Fishes were fed with floating feed containing 28% CP @ 2-3%

S. Yengkokpam, P. Das, D. Debnath, B. K. Das, T. N. Chanu and S. K. Majhi

Dori: A traditional fishing trap in Sone beel, Barak valley, Assam

"Dori", a traditional fishing trap, was found to be widely used by the fishermen in Sone beel, Karimganj district of Assam. It is a box trap, made up of split bamboo structure with 'V'-shaped inlet valves and 'U'-shaped cross section at the rear. The usual size of the trap was recorded to be 0.5-0.6 m in width and 0.5-1.2 m in height, which is supported by rows of split bamboo pieces fixed transversely at regular intervals to make it strong. It is vertically set in the slow-moving water along the marginal areas of the beel with its mouth

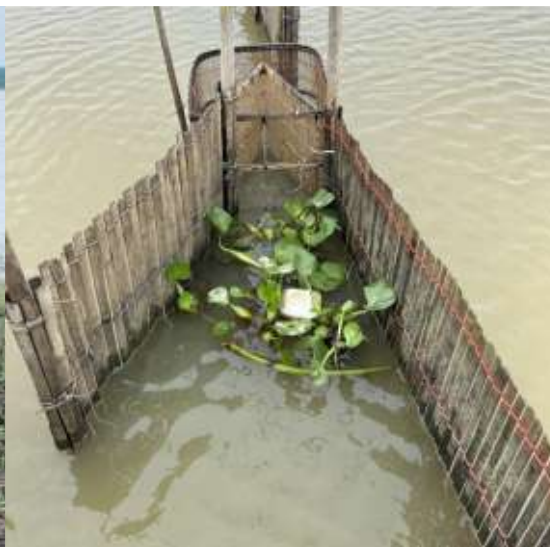


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Inner view of Dori



Dori set in the slow-moving water

directed towards water current, where depth typically ranges from 0.4 to 0.8 meters, in monsoon season. Two small-meshed nylon nets, or banas (split bamboo strips tied together with rope), each 3-3.5 meters long and 1-1.5 meters wide, are set using 1.5-2.5-meter bamboo poles in the marginal areas of the beel. These nets/banas are arranged in a 'V' shape configuration, tapering towards the trap with a gap of 0.4-0.5 meters at the narrower end. These nets/banas act as barriers for guiding fish towards the trap. The major catch in this trap comprises of

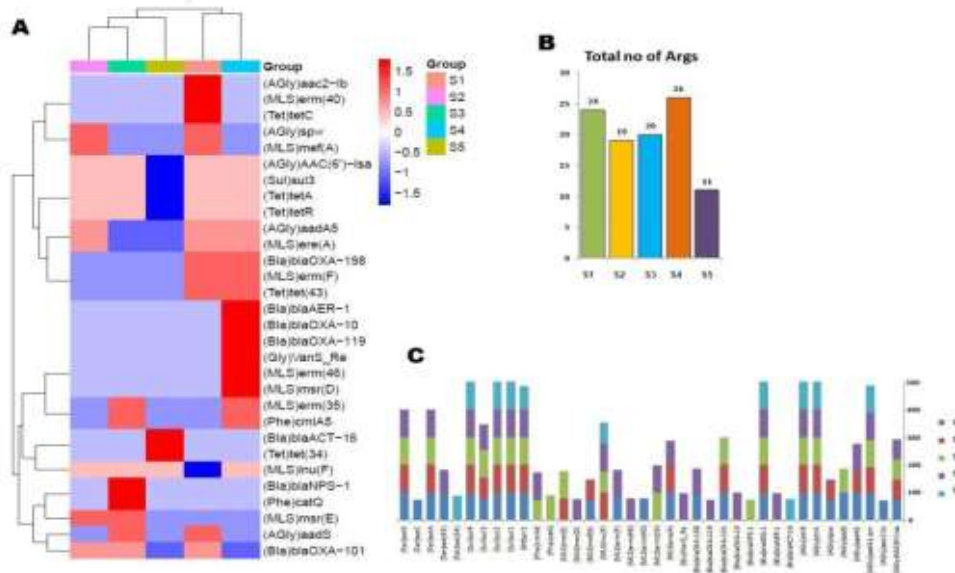
Puntius spp., *Chanda* spp., *Mystus* spp., *Macrognathus* spp., prawns etc. The CPUE varies from 250 g to 3.5 kg/operation. The cost of the trap ranges from Rs. 350-Rs. 1500 depending on the size, with a life span of 2-3 years.

S. C. S. Das, A. Kakati, D. Debnath, S. K. Majhi and B. K. Das

Revealing antibiotic resistance genes (ARGs) from a polluted wetland of Assam

The study focussed on constructing a comprehensive profile of ARGs from sediment samples of polluted Borsola wetland in Kamrup (M), Assam, using high-throughput sequencing and metagenomics analysis. Sediment samples were collected from the inlets, middle, and outlet areas of the wetland. A total of 100 ARGs were identified, with maximum ARGs in the inlet and middle points of the wetland, revealing the presence of multidrug resistance genes. The ARGs were found to be resistant to diverse types of antibiotic groups such as tetracycline (Tet), macrolide-lincosamide-streptogramin (MLS), β -lactam (bla), aminoglycoside (AGly), phenicol (phe), and sulphonamide (Sul).

The genes sul4, sul2, sul1, arr2, blaGES-1, strB, strA, and aadA1-pm were predominant at all the sites, whereas genes such as tetC, erm (40), and aac2-lb were prevalent at S1 (inlet site). The genes such as catQ and blaNPS-1 were predominant at S3 (middle site), and gene tet(34) and blaACT-16 were predominant at S5 (outlet site). The highest resistant microbe abundances were recorded for *E. coli*, *P. aeruginosa*, *K. pneumonia*, *S. aureus*, *Enterobacter* spp., and some uncultured bacteria. The study highlights the increase of ARGs in urban wetland environments and draws attention to the control use of antibiotics and emissions to protect public health.



ARGs heatmap (A), total numbers of ARGs(B) and abundance of ARGs (C)

N. Sharma, V. Kumar, S. Roy and B. K. Das

Invasive vermiculated sailfin catfish *Pterygoplichthys disjunctivus* in the Deepor beel, Assam

Pterygoplichthys disjunctivus, commonly known as the vermiculated sailfin catfish, is a species native to South America, specifically found in the Amazon River Basin and various river systems throughout Peru, Ecuador, Brazil, and Colombia. It belongs to the Loricariidae family, known for their armored bodies and sucker-mouth adaptations. They are primarily herbivorous, feeding on algae and plant matter that they scrape from surfaces using their specialized mouthparts. Recently, a specimen has been collected from Deepor Beel, the only Ramsar site in Assam. The specimen measures 28.1 cm in TL, 20.7 cm in SL, 3.5 cm in body depth, 3 cm in head depth, and 1.7 cm in mouth gap. The collected specimen has one pair of barbels. The occurrence of this invasive species in Deepor beel is a serious concern for the beel ecosystem, as it is considered invasive due to its ability to disrupt local ecosystems and out compete native species for resources.

S. Borah, P. Das, B. C. Ray and S. K. Majhi



Sailfin catfish *Pterygoplichthys disjunctivus* caught in the Deepor beel

Value addition of SIFs through smoking: perspective of Narmada River fishers



Smoked fish, and women fishers with final product

Fish species including *Puntius* spp., *Pethia* spp., *Garra* spp., *Channa* spp., *Salmophasia bacaila*, *Osteobrama cotio*, *Systomus sarana*, *Botia dario* and *Lepidocephalichthys guntea* were used for preparing smoked fish. The smoked fish is sold to the local area fish market in addition to household consumption. The cost of the smoked fish varies according to the season and species used, ranging from Rs. 250 to Rs. 400 per kg. Almost all female fishers were reported to be involved in the smoking process; the extent of this involvement varies according to the type and quality of fish harvested. According to the fishermen in the area, smoked fish has medicinal properties that should be assessed through further studies.

D. Bhakta, C. Johnson, P. Gogoi, M. H. Ramteke, S. P. Kamble, S. K. Manna and B. K. Das

First record of leech *Helobdella* sp. (annelids), a freshwater macrobenthos from the middle stretch of river Ganga at Uttar Pradesh

While studying the distribution, abundance, and seasonal variation of macro-benthic fauna in the upper and middle stretches of the river Ganga, during winter season sampling, the freshwater "two-eyed flat" leech (*Helobdella* sp.) belonging to Class-Clitellata, Order-Rhynchobdellida, and family-Glossiphoniidae was recorded for the first time from the middle stretches of the river Ganga at Bijnor (Lat 29° 22' 47" N, long 78° 02' 01" E). *Helobdella* is predatory in their feeding behavior, and they generally feed on the gastropoda (*Lymnaea acuminata*) and dead carcasses of aquatic vertebrate's viz., fish and amphibians.



Helobdella sp. from Bijnor, Uttar Pradesh

V. R. Thakur, S. K. Verma, U. Singh, S. K. Mishra, D. N. Jha, A. Alam, V. Kumar, J. Kumar and B. K. Das



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(January - June 2024)

Range expansion of a cold-water fish *Schizothorax richardsonii* in the Ganga River: A probable impact of climate change



Schizothorax richardsonii

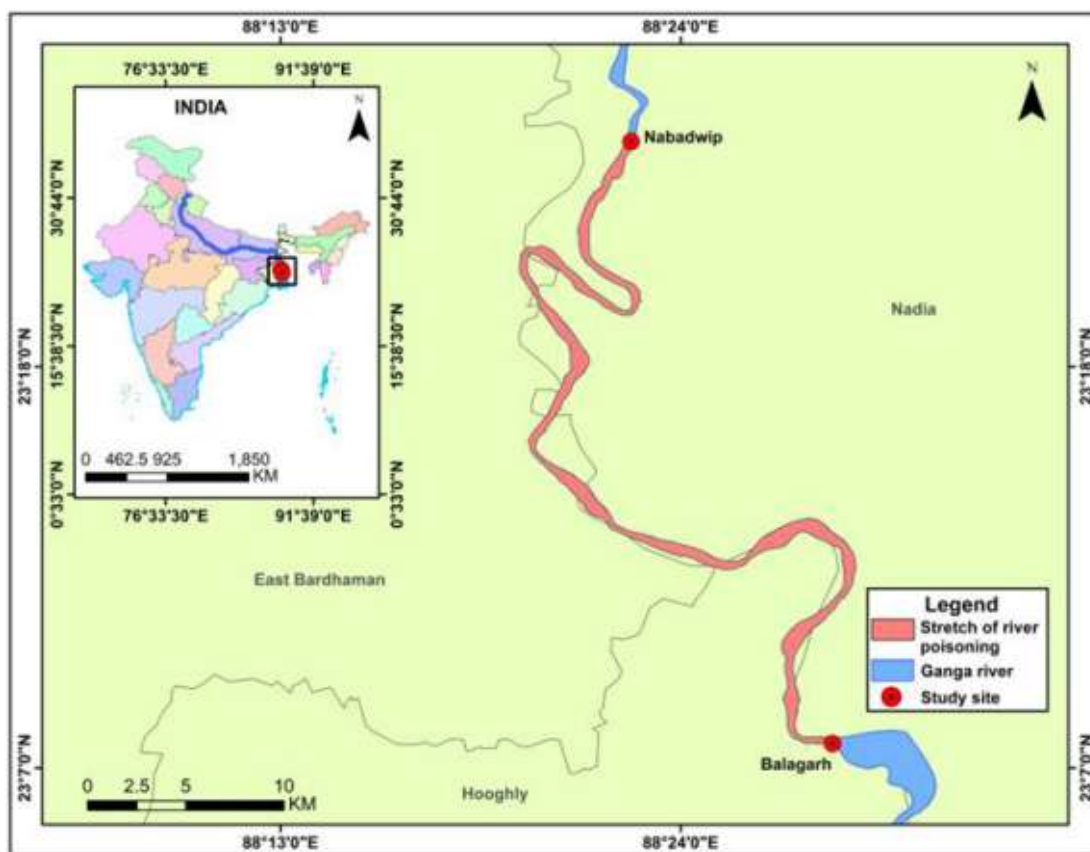
with temperatures ranging from 8°C to 22°C, water flow of 2.8-4 m/s, pH levels between 7.4 and 8.2, and DO concentrations of 8-10 mg/l. The capture of *Schizothorax richardsonii* from Bijnor (Latitude 29°22'48" N and Longitude 78°02'40" E) marks the first report of this cold-water fish species being found in an area with environmental conditions significantly different from its native higher-altitude habitats. Their presence in Bijnor, a region characterized by higher temperatures and different water chemistry, suggests a notable shift in their distribution likely driven by changing climate conditions. This first report of the *S. richardsonii* in such an area underscores the need for continuous monitoring and research to understand the long-term climatic impact on the species.

Changes in temperature, precipitation patterns, and the frequency of extreme weather events can significantly affect the habitats and survival of the cold-water species. *S. richardsonii* is widely distributed across the Himalayan region in India. This species is typically found at elevations ranging from 300 to 2810 MSL. *S. richardsonii* can withstand a wide range of temperature variations but prefers snow-fed torrential streams and pools

A. Alam, R. A. Bhat, D. N. Jha, V. R. Thakur, V. Kumar, S. K. Mishra and J. Kumar

Indiscriminate use of pesticides for fishing in River Ganga raises alarm

A recent survey has found the fishers using synthetic pyrethroid groups of pesticides in harvesting crustaceans and other aquatic ichthyofauna in the Ganga. In the lower stretch of the Ganges in West Bengal, fishers use pesticides rampantly targeting lucrative giant freshwater prawn species *Macrobrachium rosenbergii*. During the high tide, when the water level rises, illegal fishers manually disperse the chemicals in the river. The fishing operation lasts for 4-5 h close to the banks of the river, where the flow is generally lower than the mid-channel. This practice causes long-lasting and irreversible damage to aquatic ecosystems and kills almost all living organisms. The practice also has serious impacts on cattle, other terrestrial animals, and the local populace of the region. Fish caught using pesticides can be dangerous for human consumption too. Stringent action plans are greatly warranted by the government and environmental agencies to protect the aquatic flora and fauna.



Prevalent area in River Ganga for rampant use of pesticides for fishing

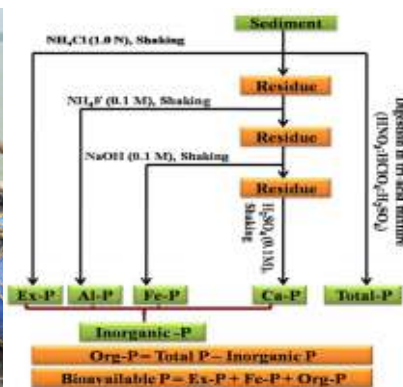
A. Saha, A. Ray, V. Kumar, K. Mondal and B. K. Das

Sampling



Ganga River
Sediment
collection

Extraction



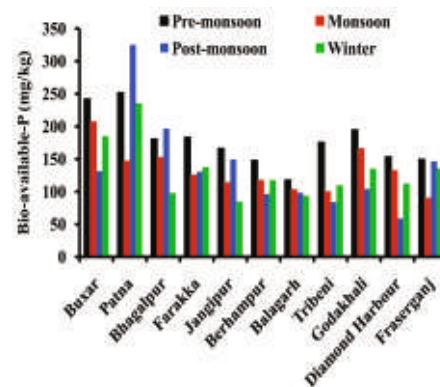
Sequential p
extraction

Analysis



Phospho-
molybdenum
blue

Result



Dominance of bio-
available P can change the
trophic status of the river

Sediment phosphorus fraction in Ganga River

Geochemical partitioning of sediment-bound phosphorous in River Ganga: Status of bioavailability, pollution sources, and eutrophication implications

Geochemical fractions, bioavailability, and ecological risk of phosphorus in surface sediment of the river Ganga were investigated. To better understand the P dynamics, sequential chemical extraction techniques were used to study sediment P pool distribution such as exchangeable (Ex-P), aluminum bound (Al-P), iron bound (Fe-P), calcium bound (Ca-P), and organically bound phosphorus (Org-P). A significantly higher level of total P was recorded in the pre-monsoon season (438.49 ± 95.76 mg/kg) than in other [winter (345.68 ± 110.62 mg/kg), post-monsoon (319.20 ± 136.30 mg/kg), and monsoon (288.63 ± 77.32 mg/kg)] seasons and was primarily composed of inorganic P. Ca-bound P was the dominant fraction of P in sediments. Sources such as agricultural activities along with sewage from both industry and domestic activities all have an impact on the P dynamics in the river Ganga. Bioavailable phosphorus (BAP) suggests the availability of an ample amount of bioavailable P fractions (37.8-46.0%) in sediments. However, an estimated phosphorus pollution index based on sediment total P content showed no ecological risk of phosphorus to Ganga River sediment. This information will be useful for applying different mitigation techniques to lower the phosphorus load in river ecosystems.

A. Saha, B. K. Das, N. K. Tiwari, S. Chauhan, C. Jana, M. H. Ramteke, C. Johnson, R. Baitha, H. S. Swain, A. Ray, S. Das Gupta, P. Gogoi and T. Kayal

Fish farmers are more technically efficient than crop and vegetable farmers-revealed Data Envelopment Analysis

In the farming system analysis, the technical efficiency (TE) models are widely used to study the technical performances of farms. The present investigation analyses the primary data collected from 320 member farmers of 16 FPOs of West Bengal and Assam in the year 2023-24. The study found that the cost of cultivation/culture was highest in fishes followed by vegetables and crops. In fishes, the cost per acre was found to be more than Rs. one lakh. Feed was the major cost item in fishes whereas labour was found to be the major cost item for crops and vegetables. The yield of all the crop, vegetable and fishes were found to be higher in West Bengal. However, the net return in vegetables was higher in Assam owing to higher farm gate prices. The output-input ratios were highest in fishes followed by vegetables and crops. The pattern is similar in both the states. The Data Envelopment Analysis (DEA) indicated that the fish culture was more technically efficient than crop and vegetables. The average measure of overall technical efficiency in crop and vegetables was very low, 0.305 and 0.270, respectively in West Bengal (TE ranges from 0 to 1, 0 being the least efficient). In Assam, the corresponding figures are 0.176 and 0.438. In fish farmers the overall technical efficiency was better at 0.762 and 0.731 in West Bengal and Assam, respectively. Further, it was found that the scale in-inefficiency was primarily responsible for overall technical in-efficiency as compared to the pure technical in-efficiency. Majority of the crop and vegetable farmers were operating under sub-optimal scale. Adoption of the best practices of the efficient farms could improve the technical efficiencies and the problem of overall technical in-efficiency can be tackled by solving the problem of increasing return to scale.

A. Pandit, B. Saha, H. K. De and A. Ekka



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सिफरी समाचार CIFRI NEWS

(January - June 2024)

Activities Under NEH Projects

Satellite symposium on NE fisheries

The Guwahati Regional Centre of the Institute organized a satellite symposium on “Sustainable fisheries and aquaculture in Northeast India” as a part of the 13th Indian Fisheries and Aquaculture Forum (13th IFAF), 23-25 February 2024. Deliberations were made on different aspects of NE fisheries during the symposium. On the occasion, a book on “Open water fisheries development in Northeast India: ICAR-CIFRI's interventions” was released along with eight leaflets and two technology factsheets pertaining to NE open water fisheries.

B. K. Das, S. K. Majhi, B. K. Bhattacharjya, S. Yengkokpam, D. Debnath, A.K. Yadav, P. Das, S.C.S. Das, S. Borah, N. Sharma and R. Kumar



Satellite symposium on NE fisheries in 13th IFAF

Popularization of ornamental fish farming in Sikkim for livelihood improvement



Awareness cum input distribution programme at Gangtok, Sikkim



The Institute, in collaboration with the Department of Fisheries (DoF), Govt. of Sikkim, organized an awareness-cum-input distribution program in Gangtok, Sikkim, on 11 June 2024. Inputs such as FRP tanks, ornamental fish seeds (goldfish and Koi carps), fish feed, and all necessary accessories for start-up ornamental fisheries in the state were distributed among 52 beneficiaries in the five (Gangtok, Soreng, Geyzing, Namchi, and Mangan) districts of Sikkim under the NEH and SCSP

programs of the institute. A technical session was also conducted by the scientists of ICAR-CIFRI for discussing ornamental fisheries setup, breeding, and fish health management.

Niti Sharma, B. K. Das and S. K. Majhi

Field visit to cage culture sites in Dumbur Reservoir, Tripura

Dumbur reservoir is located around Gomti and Dhalai districts of Tripura with a water-spread area of 3049 ha. Dr. B. K. Das, Director of the institute, along with Dr. S. C. S. Das, Senior Scientist, visited the cage culture sites in the reservoir on 18 May 2024. The ICAR-CIFRI team was accompanied by Shri S. Das, TCS, SSG, Director of Fisheries, Tripura; Shri Gopal Shepra, Joint Director of Fisheries; Executive Engineer (Fisheries); Dy. Director of Fisheries, Gomati district; Supdt. of Fisheries, Planning; Supdt. of Fisheries, GRP; Supdt. of Fisheries, Gandatwisa; Shri Manoj Paul, Junior Engineer; and other fisheries officials. The DoF officials informed the joint team that a total of 1512 cages were installed in the reservoir. Some suggestions made by the institute were i) culturing locally important candidate fish species; ii) regular and proper feeding; iii) precautionary measures from chocking of net cages due to bio-fouling; iv) training of fishers on different aspects of cage culture; v) proper site selection and installations of cages; vi) cohesive cage farmer groups for better operational convenience; and vii) ensuring the supply of quality seed and feed for cage culture by the DoF.



Visit to cage culture sites in Dumbur Reservoir

B. K. Das, S. C. S. Das and S. K. Majhi

River Ranching Programme

With the objective of restoring the indigenous fishery in the river Ganga, the institute has been continuing its efforts of ranching the fingerlings of the selected fishes. During the last 6 months, the institute has ranched a total of 31.16 lakh fingerlings of Indian Major Carps (IMC), Mahseer, and catfish in 18 different events in Uttar Pradesh, Bihar, Jharkhand, and West Bengal under the Namami Gange Project. The fishes were bred artificially using wild brooders from the Ganga and reared up to fingerling/advanced fingerling size before releasing them into the river. The maximum ranching activities were carried out in the state of West Bengal (57%), followed by Bihar (23%), Uttar Pradesh (12%), and Jharkhand (8%) during the period from January to July 2024. The National Ranching Mission-III was inaugurated by the Secretary, DARE, and DG, ICAR Dr Himanshu Pathak, and DDG (Fisheries Sc.) Dr. Joykrushna Jena on 19 January 2024 at Barrackpore, West Bengal.

Shri G. Asok Kumar, IAS, the former DG, NMCG, participated in the ranching program at Farakka and Nabadwip on 10 February 2024. The District Magistrate, Shri Avneesh Kumar, IAS, released the seeds of IMC at Munger, Bihar. In addition, 10,000 individual Sarana (Sar Puti) were released into the Ganga River at Barrackpore with the presence of Sri Saurav Barik, SDO, Barrackpore. Along

with the river ranching activities, ICAR-CIFRI is also generating awareness among the stakeholders for restoration and conservation of fisheries and aquatic organisms.

The ICAR-CIFRI, Prayagraj organized a series of ranching cum mass awareness programs under the National Ranching Programme 3.0 in the rivers Ganga and Yamuna. Depleted fish species of the Ganga River system were released into the Yamuna River at Prayagraj on 7 May 2024, and into the Ganga River at Kadadham, Sirsa, and Mirzapur, respectively, on 9, 11, and 15 May 2024. Around 10,000 advanced fingerlings of Indian Major Carp were ranched into the Yamuna River, while 10,000, 15,000 and 25,000 fingerlings were ranched into the Ganga River at Kadadham, Sirsa, and Mirzapur, respectively.



Ranching at Barrackpore (19.01.24)



Ranching at Sangam, UP (06.03.24)



Ranching and awareness at Ayodhya, UP (13.03.24)



Ranching at Prayagraj in Yamuna river (09.05.24)



Ranching at Sirsa in Ganga river (11.05.24)



Ranching at Belur (15.06.24)



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सिफरी समाचार CIFRINEWS

(January - June 2024)

Technology Management News

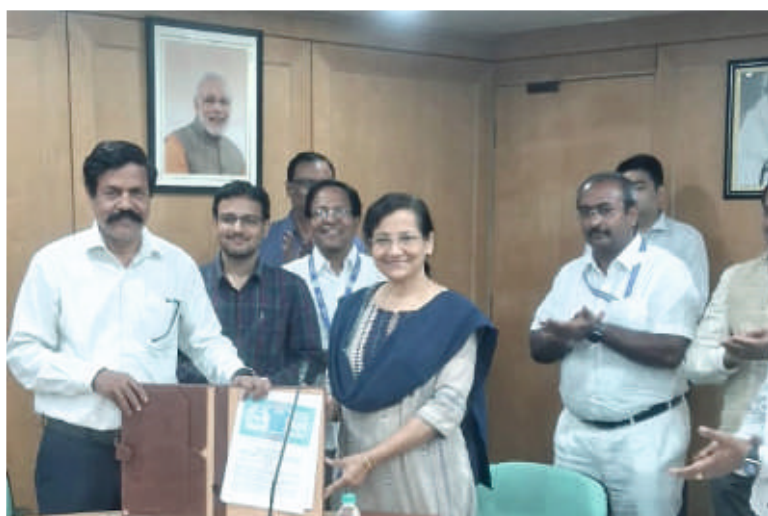
Sr. No.	Kind of IPR	Name	Status	Number	Date
1.	Patent	Vertical slab gel electrophoresis	Granted	523365	11 March
2.	Patent	Do it yourself (DIY) type out-staged bio-filter recirculatory aquarium (OBRA) system for ornamental fish rearing	Filed	202431021172	20 March
3.	Patent	Incorporating <i>Antheraea mylitta</i> pupae meal in fish feed, restricting fish meal, methods thereof	Filed	202431034963	02 May
4.	Patent	IOT-based dissolve oxygen management system with aerator controller and cloud-based monitoring system	Filed	202431039433	20 May
5.	Trademark	Fish Tanavhari	Registered	5164182	15 February
6.	Trademark	CIFRI Alga S+	Filed	6364884	30 March
7.	Trademark	CIFRI Aquapromo	Filed	6432012	14 May
8.	Copyright	Mapping of Inland Water Bodies of Telangana	Registered	L-141507/2024	18 January
9.	Copyright	Inland Waterbodies of Bihar	Registered	L-142372/2024	30 January
10.	Copyright	Catch Assessment Software for the Chhattisgarh State, India	Registered	SW-18310/2024	20 February
11.	Copyright	Catch Estimation Methodology for Inland Water Bodies	Registered	L-146050/2024	01 April
12.	Copyright	Success stories from wetlands	Registered	L-143399/2024	12 February
13.	Copyright	GIS Mapping of Inland Water Bodies of Odisha	Registered	L-146952/2024	23 April
14.	Copyright	Catch Estimation Methodology for Inland Water Bodies	Filed	2813/2024-CO/L	24 January
15.	Copyright	Eco Restoration of Duma Fisheries-CIFRI Intervention	Filed	2816/2024-CO/CF	24 January
16.	Copyright	Success Stories Wetlands of Bihar Series II	Filed	7575/2024-CO/L	11 March
17.	Copyright	Inland Fisheries Development in Mayurbhanj	Filed	7690/2024-CO/L	12 March
18.	Copyright	Sundarbaner Khudra Matsya Chasider Daridta Durikarner Mahat Prayas (in Bengali)	Filed	8835/2024-CO/CF.	21 March

Commercialization and licensing of CIFRI Fish Tanavhari

The Institute signed a technology license agreement for “CIFRI Fish Tanavhari” with Glaucus Agrochem Pvt. Ltd. on 16 April 2024. A non-exclusive license for a period of five years for the manufacturing and sale of CIFRI Fish Tanavhari in the territory of India was granted. The commercialization process was completed through Agrinnovate India Ltd., the commercial arm of the ICAR.

MoU Signed

Sr. No.	Date	With	Purpose
1.	19 March 2024	Damodar Valley Corporation	Establishing Cage Culture Station at Maithon Reservoir, Bankura, West Bengal
2.	16 April 2024	Glaucus Agrochem Ltd. And Agrinnovate India (AgIn)	Non-exclusive license agreement of "CIFRI Fish Tanavhari" technology



MoU with DVC



MoU with M/S Glaucus Agrochem Ltd.

Staff Corner

New appointments (January – June 2024)



Name & designation ► **Armaan U. Muzaddadi**
PS & HoD, OWAPM

Shri Biswajit Barua
Administrative Officer

Shri Rikesh Sarkar
Technical Trainee

Abdul Ajj Al Amin
Technical Trainee

Place of posting ► ICAR - CIFRI
Headquarters
Barrackpore

ICAR - CIFRI
Headquarters
Barrackpore

ICAR - CIFRI
Headquarters
Barrackpore

ICAR - CIFRI
Headquarters
Barrackpore

Date of joining ► 12 March

01 May

24 April

29 April



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सिफरी समाचार CIFRINEWS

(January - June 2024)

New appointments (January – June 2024)



Name & designation ► Shri Chandan Kumar
Technical Trainee

Place of posting ► ICAR - CIFRI
Headquarters
Barrackpore

Date of joining ► 30 April



Shri Manish Kumar
Technical Trainee

ICAR-CIFRI
Regional Centre
Prayagraj

30 April



Shri Sandeep Kumar Saw
Technical Trainee

ICAR - CIFRI
Headquarters
Barrackpore

02 May



Shri Chandan Kumar
Technical Trainee

ICAR - CIFRI
Headquarters
Barrackpore

02 May



Name & designation ► Shri Pankaj Kumar
Technical Trainee

Place of posting ► ICAR - CIFRI
Headquarters
Barrackpore

Date of joining ► 02 May



Shri Abhijeet Kumar Gupta
Technical Trainee

ICAR - CIFRI
Headquarters
Barrackpore

06 May



Shri Sumeet Dungdung
Technical Trainee

ICAR-CIFRI
Regional Centre
Guwahati

08 May



Name & designation ► Shri Sitanshu Kumar
Technical Trainee

Place of posting ► ICAR-CIFRI
Regional Centre
Vadodara

Date of joining ► 08 May



Shri Shubham Kumar
Technical Trainee

ICAR - CIFRI
Headquarters
Barrackpore

09 May



Shri Hansraj Kumar
Technical Trainee

ICAR - CIFRI
Headquarters
Barrackpore

03 June

Superannuation (January – June 2024)

Name & designation	Last place of posting	Date of superannuation
Shri S. Kalita, Skilled Support Staff	Regional Centre, ICAR-CIFRI, Guwahati	31 January
Shri U. S. Ram, Skilled Support Staff	Regional Centre, ICAR-CIFRI, Prayagraj	31 January (VRS)
Sheri M Pennapaa, Technician	Regional Centre, ICAR-CIFRI, Bangalore	31 May

Promotions (January – June 2024)

Name & designation	Promoted to	With effect from
Ms. Sreemanti Saha, UDC	Upper Division Clerk	10 April
Shri Aritra Datta, UDC	Upper Division Clerk	10 April
Shri Debasish Acharya, UDC	Upper Division Clerk	10 April
Shri Syed Abol Kabi, UDC	Upper Division Clerk	10 April
Shri Somenath Banerjee, UDC	Upper Division Clerk	10 April
Shri Manish Kumar Singh, Assistant	Assistant	19 April

Transfers (January – June 2024)

Name & designation	From	To
Shri Kumar Vivek, Chief Administrative Officer	ICAR-CIFRI, Head Office Barrackpore	ICAR-IGFRI, Jhansi



Shri Kumar Vivek (at the right)



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Cसिफरी समाचार CIFRI NEWS

(January - June 2024)

Awards & Recognition

- Dr. B. K. Das, Director, was the Chief Guest in the International Seminar on “Green Management of the Environment Using Eco-Friendly Technology-2024”, organized by the University of Kalyani, Kalyani, on 20 February 2024. He also served as the Chief Guest in the capacity-building program on “Scientific Agri. Horticultural Practices to Augment the Income from Small Farming” for PC, SMS, and other technical staff of KVKs of West Bengal on 08 January 2024.
- Dr. B. K. Das, Director delivered a keynote address on “Aquaculture and Inland Fisheries of India: Status, Challenges, and Opportunities on 22 March 2024 in the National Seminar on “Recent Innovations in Animal Science Research” at U. N. Autonomous College, Adaspur, Cuttack. He also delivered a keynote address (online mode) on the “Fisheries Enhancement in River Ganga: A holistic approach in the last eight years” in the 4th International Conference on River Corridor Research Management (RCRM) on 09 March 2024.
- Dr. B. K. Das, Director, represented ICAR-CIFRI, in the State Level Workshop on Sustainable Development and Management of Floodplain Wetlands (Beels) in Assam on 19 June 2024 at Khanapara, Guwahati.
- Dr. Dibakar Bhakta received the Best Oral presentation award for his presentation on “Status of Gangetic River dolphin *Platanista gangetica* (Lebeck, 1801) in the lower stretch of the Ganga River, India, with emphasis on treats, conservation, and recommendations” during the 13th Indian Fisheries and Aquaculture Forum 2024 on 23–25 March 2024.



Dr. D. Bhakta (at the middle)



Dr. Jesna P. K. (third from left)

- Dr. Sona Yengkokpam received the Best Oral presentation award for her presentation on “Polyculture of *Amblypharyngodon mola* with major carps in pens in a floodplain wetland of Manipur, India,” during the 'Satellite Symposium on NE Fisheries' during the 13th Indian Fisheries and Aquaculture Forum on 23-25 Feb, 2024.
- Dr. Suvra Roy received the Best Oral Paper Presentation Award for her work “Parental conditioning with phloroglucinol protects their offspring from biotic and abiotic stressors in brine shrimp and freshwater prawn” during the 13th Indian Fisheries and Aquaculture Forum 2024 on 23–25 March 2024. She also bagged the Best Poster Presentation Award for the poster “A metagenomic tale: new insights into the microbial community of East Kolkata Wetland natural sewage treatment system”.
- Dr. Simanku Borah received the Best Poster Presentation Award for his work “Fostering food and livelihood security of small scale beel fishers through culture-based fisheries and stock enhancement” in the 13th Indian Fisheries and Aquaculture Forum 2024 on 23–25 March 2024 on the theme 'OMICs approach in fisheries and aquaculture'.
- Dr. Jesna P. K. received the Best Poster Presentation Award for her work “The phytoplankton dynamics in a tropical reservoir, indicating the health of the system” in the 13th Indian Fisheries & Aquaculture Forum on the theme 'OMICs approach in fisheries and aquaculture' during 23-25 February 2024.
- Dr. Pronob Das was awarded the “Excellence in Research Award” by the Society for Agriculture and Allied Sciences, Odisha, for his outstanding contribution in the field of fisheries science.



Dr. S. Roy (at the middle)



Dr. Pronob Das was awarded with
“Excellence in Research Award”



Dr. B.K. Behera (third from left) is being felicitated on his selection as the Dean of the College of Fisheries,
RLB Central Agricultural University, Jhansi



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सिफरी समाचार CIFRI NEWS

(January - June 2024)

Training and Capacity Building

Training of the Bihar fishers/fish farmers: A total of 10 training programs were organized during January-June 2024 on 'Inland Fisheries Management' for the Bihar fishers/fish farmers at the CIFRI HQ. The details are as follows:

Sl. No.	Date	No. of participants
1.	03-09 February	30 fish farmers from Sheohar
2.	30 January to 05 February	30 fish farmers from Gopalganj
3.	07-13 February	30 fish farmers from Darbhanga
4.	05-11 March	30 fish farmers from Katihar
5.	02-08 April	30 fish farmers from Munger
6.	11-17 April	30 fish farmers from Jamui
7.	23-29 April	30 fish farmers from Sheikhpura
8.	02-08 May	30 fish farmers from Saran
9.	14-20 May	30 fish farmers from Madhepura
10.	07-13 June	30 fish farmers from Rohtas



Gopalganj district farmer trainees



Katihar district farmer trainees

Other trainings for farmers/fishers: January-June 2024

Sl. No.	Title of the training programme	Date	No. of participants	Venue
1.	ATMA sponsored training on "Inland Fisheries Management"	16-20 January	21 farmers from Sahibganj, Jharkhand	CIFRI HQ
2.	Pen and Cage culture for production enhancement in inland openwaters	13-15 February	25 fish farmers	ICAR-CIFRI Regional Centre, Guwahati
3.	ATMA sponsored training on "Inland Fisheries Management"	27 February - 02 March	25 farmers from Pakur, Jharkhand	CIFRI HQ
4.	Status, prospects and management of river, wetland and reservoir fisheries in Northeast India	12-14 March	25 fish farmers	ICAR-CIFRI Regional Centre, Guwahati
5.	Training on "Inland Fisheries Management" in collaboration with Development Foundation (NGO)	28-31 May	21 farmers from Gajapati District, Odisha)	CIFRI HQ
6.	Training on "Inland Fisheries Management" in collaboration with Development Foundation (NGO)	26-29 June	21 farmers from Kalahandi District, Odisha)	CIFRI HQ



The DDG (Fy. Sc.) and the Director with the trainees of ATMA, Sahibganj



Fish farmers from Bihar at ICAR-CIFRI ornamental unit



Training programs conducted by the ICAR-CIFRI, Guwahati center



Students Training

Sl. No.	Title of the training programme	Date	No. of participants	Venue
1.	Inland fisheries management	11-20 January	10 nos. of 3 rd semester students of FRM Dept, ICAR-CIFE, Mumbai	CIFRI HQ
2.	Fish Proteomics	16-18 January	18 participants (Faculty, UG and PG students, researchers, and faculties)	CIFRI HQ
3.	Bioinformatics tools and its application in predictive ecology and fisheries	19-25 January	16 participants (Faculty, researchers, and students)	CIFRI HQ
4.	Collaborative training programme of ICAR-CIFRI and MANAGE, Hyderabad on Nutri-Fish to nutritional security of the rural populace	20-22 March	20 participants	CIFRI HQ
5.	A fundamental GIS training programme on GIS mapping	29 April-01 May	38 research scholars	CIFRI HQ
6.	Basics of GIS mapping on open source software	21-24 May	36 participants including scientists, research scholars	CIFRI HQ
7.	Hands on training on "Molecular tools for Aquatic Resource Management"	27 May-01 June	32 trainees including Assistant professor, students (UG, PG, and PhD) and researchers from various universities, colleges and research institutes across the country	CIFRI HQ



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Training on bioinformatics tools



CIFRI-MANAGE training programme



Training on molecular tools for aquatic resource management

Official Training

Sl. No.	Name of the training	Date	Participants	Venue
01.	Inland fisheries management	29 January - 02 February	30 nos. of officials under JOHAR programme, Jharkhand State Livelihood Promotion Society under Dept. of Rural Development, Jharkhand	CIFRI HQ
02.	Hands-on-training on e-HRMS 2.0	19 June	30 officials of different ICAR institutes	CIFRI HQ



Training on e-HRMS 2.0

Exposure Visits

Sl. No.	Particulars of visitors	Date of visit	Venue
1.	23 farmers from Rahe, Ranchi, Jharkhand under Jharkhand Samajik Kalyan Sansthan sponsored by ATMA, Dhanbad under Dept. of Agri, AH and Co-operative, Govt. of Jharkhand	23 January	CIFRI HQ
2.	40 B.Sc. (Hort.) students (7 th Semester) of College of Horticulture, Chaibasa under BAU, Ranchi	31 January	CIFRI HQ
3.	15 nos. of B.F.Sc. students of ICAR-CIFE, Kolkata	05 February	CIFRI HQ
4.	16 fish farmers from Tehri, Garhwal, Uttarakhand	12 February	CIFRI HQ
5.	41 B.F.Sc students of CoF, Tripura under CAU, Imphal	29 February	CIFRI HQ
6.	45 B.F.Sc. Students, and two Asst. Professors from College of Fisheries, Mangalore, Karnataka	14 March	ICAR-CIFRI Regional Centre, Bangalore
7.	40 B.F.Sc. 4 th year students of TNJFU, Tamil Nadu	16 March	CIFRI HQ
8.	2 nos. trainees from ICAR-CIFE, Kolkata	19 March	CIFRI HQ
9.	15 nos. students from Gurukul College, Sonarpur, WB	03 April	CIFRI HQ
10.	30 nos. B.F.Sc. students from CoF, OUAT, Rangeilunda, Odisha	09 April	CIFRI HQ
11.	35 nos. 4 th Year B.F.Sc. students from TNJFU, Tamil Nadu	12 April	CIFRI HQ
12.	21 students of Allen Career Institute, Barrackpore, West Bengal	06 June	CIFRI HQ
13.	29 nos. students of B.Sc. Zoology Hons. 3 rd year students of Bhairab Ganguly College, Belgharia, West Bengal	28 June	CIFRI HQ



Students of College of Fisheries, Mangalore at ICAR-CIFRI Regional Centre, Bangalore



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Exhibitions/Mela

Exhibitions ICAR-CIFRI participated during January to June 2024

Sl. No.	Date	Particulars	Place
1.	03-05 January	Exhibition at the Farmers' Fair organized by ICAR-NINFET	Ranikuthi, Tollygunj, Kolkata
2.	12-14 January	Exhibition at Krishi Samridhi Mela cum National Seminar: 2022-23	Sargachi, Murhidabad, WB
3.	02-04 February	Aqua Goa Mega Fish Festival at Panjim, Goa	Panjim, Goa
4.	03-05 February	Regional Agricultural Fair for Eastern Region - 2024	KVK, Diyankel, Torpa Block, Khunti, Jharkhand
5.	07-09 February	Krishi Mela at Sashya Shyamala KVK	Sashya Shyamala KVK, Sonarpur
6.	08-10 February	Regional Farmer Fair, RLBCAU, Jhansi	Rani Lakshmi Bai Central Agricultural University, Jhansi
7.	16-18 February	F&ARD fair "Matsya-Pranee Samavesh Odisha (MPSO)-2024"	Janata Maidan, Bhubaneswar, Odisha
8.	23-25 February	Exhibition at 13 th Indian Fisheries and Aquaculture Forum on "Fostering Indian Fisheries and Aquaculture for Attaining Sustainable Development Goals"	Biswa Bangla Convention Centre, Kolkata
9.	02 March	Exhibition at the Kisan Mela cum farmers-Scientists Interaction on "Livestock Fiesta: Raising Resilient Livelihood in Eastern India" organized by NDRI, Kalyani Centre	ICAR-NDRI, ERS, Kalyani
10.	09-11 March	Exhibition at Dairy and Krishi Mela, Chaibasa organized by ICAR-NDRI	Chaibasa, Jharkhand



ICAR-CIFRI stall at Sonarpur KVK



ICAR-CIFRI, Prayagraj stall at RLBCAU, Jhansi



ICAR-CIFRI stall at Aqua Goa Mega Fish Festival at Panjim, Goa



NINFET, Kolkata Exhibition

Mass Awareness Campaign

Name of the Camp	Purpose	Date	Venue	Participants
Awareness programme on 'Disease surveillance and report fish disease application' at Kolaghat and Contai, West Bengal	Disease surveillance	09 February 2024	Kolaghat and Contai, West Bengal	50
Awareness cum input distribution programme for the fish farmers of Assam held at Guwahati	Input distribution programme	29 February 2024	ICAR-CIFRI Regional Centre, Guwahati	30
Awareness cum input distribution programme for the fish farmers of Sikkim held at Gangtok, Sikkim	Input distribution programme	11 June 2024	Department of Fisheries, Gangtok, Sikkim	50



Awareness cum input distribution programme at Guwahati, Assam



Awareness - cum - input distribution programme at Gangtok, Sikkim



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Meetings and Events

Workshop on Fish Proteomics

The 3-days workshop on proteomics was organized by the institute for faculty, researchers, and students during 16 to 18 January 2024 at Barrackpore. Dr. B. P. Mohanty, ADG (Inland Fisheries), New Delhi, and Dr. B. K. Das, Director inaugurated the programme and emphasized the need for fish Proteomics technologies and its prospects to address key areas in aquaculture. Dr. B. P. Mohanty highlighted the importance of proteomics tools in the food industry, disease diagnosis, clinical studies, biomarker discovery, and drug discovery. Dr. B. K. Das emphasized the role of proteomics technology in the study of interactions, function, composition, and structures of proteins and their cellular activities in fish, bacteria, fungi, or any organism or cell type.



Republic Day

The 75th Republic Day was observed on 26 January at ICAR-CIFRI with great enthusiasm and joy. Dr. B. K. Das, Director hoisted the National Flag and addressed the staff. He emphasized that the Institute has achieved many milestones. He praised the staff members for their untiring and sincere efforts as well as encouraged all to work hard to keep the Institute's success on the higher note. Cultural programme was also organized on the occasion. On this special Day, the Institute awarded the best scientific, technical, administrative, skilled support staff and research scholars.

World Wetland Day

The World Wetland Day was celebrated on 02 February 2024 at Institute headquarters which was attended by a number of dignitaries. Dr. Sandeep Behera, Sr. Consultant, Biodiversity, NMCG, mentioned the genesis and purpose of the wetland day celebration and mentioned the importance of wetlands. Prof. (Dr.) B. B. Jana, University of Kalyani, also praised CIFRI's accomplishments in wetland development and emphasized the critical role of wetlands in sustaining human well-being. Prof. (Dr.) Ashis Kumar Panigrahi, Pro-

Vice Chancellor, University of

Burdwan, WB, mentioned the need for conservation of wetland and praised the role of CIFRI in wetland development at grass-roots level. Prof. Soma Mukherjee, HoD, Department of Environmental Science, University of Kalyani, WB, highlighted the importance of wetland for human wellbeing.



Industry Conclave during the 13th IFAF

The institute organized Industry Conclave during the 13th IFAF Kolkata on 24 February 2024. Shri Sagar Mehra, Joint Secretary, Department of Fisheries, Government of India, graced the event as the chief guest. The session was chaired by Dr. L. N. Murthy, Chief Executive (I/C), National Fisheries Development Board,

Dr. George Ninan, Director, ICAR-CIFT, and Shri Amit Saraogi, Managing Director, Anmol Feeds Ltd. & Chairman, Livestock Task Force of the Confederation of Indian Industries. Dr. B. K. Das, Director, ICAR-CIFRI, and Convener, 13th IFAF & Director, ICAR-CIFRI, were also present. The dignitaries briefed about the importance of industrial promotion and collaborative research and development in the fisheries and aquaculture sectors. Dr. Arun Pandit and Shri Ganesh Chandra coordinated the event.



Conclave on Career Opportunities in Fisheries and Aquaculture Sector

'Student Interface Meet' was held on 23 February 2024 under the aegis of 13th IFAF. On this occasion, Prof. Manimaran Baskaran, Former VC, TNJFU, Prof. Iddya Karunasagar, Research Advisor, NITTE University, Mangalore, and Prof. S.D. Singh, Former ADG, ICAR, chaired the session, while Prof. S.K. Udgate, Dean, CoF, Odisha, Prof. R.K. Trivedi, WBUAFS, Kolkata, and Dr. S.K. Majhi, Head, ICAR-CIFRI, Regional Centre, Guwahati, acted as panellists.

Technical Session on Precision Farming, ICT, Sensors, GIS and Robotics

A technical session on

"Precision farming, ICT, sensors, GIS, and robotics in fisheries" was conducted on 25 February 2024 during the 13th IFAF on 23-25 February 2024, at Biswa Bangla Convention Centre, Kolkata. The session was chaired by Dr. Amitabha Bondyopadhyay, Chairman (TAC), ICAR-NePPA, and Dr. Rabi N. Sahoo, Principal Scientist, IARI, and Program Leader (ICAR-NePPA). Other dignitaries, Dr. J. K. Jena, DDG (Fishery Science), ICAR, New Delhi; Dr. B.P. Mohanty, ADG (Fishery Science), ICAR, New Delhi; Dr. Dilip Kumar, Former Director, ICAR-CIFE, Mumbai; Dr. B.K. Das, Director, ICAR-CIFRI, Barrackpore; and Dr. P. K. Sahoo, Director, ICAR-CIFA, Bhubaneswar, were also present in the session.



78th Foundation Day of the ICAR-CIFRI

ICAR-CIFRI commemorated its 78th Foundation Day on 17 March 2024, at its headquarters in Barrackpore. Since its establishment in 1947, ICAR-CIFRI has been actively engaged in research, training, and extension activities aimed at the comprehensive development of fisheries in inland open waters. The event was chaired by Dr. B. Meenakumari, Former Deputy Director General (Fy. Sc.), ICAR, as the Chief Guest. Dr. B. P. Mohanty, ADG (Inland Fisheries), ICAR; Prof. Gautam Saha, Vice Chancellor of BCKV; Dr. Pradip Dey, Director of ICAR-ATARI; Dr. A. K. Singh, Former Director of ICAR-DCFR; and Dr. Madan Mohan, Former ADG (Marine Fy.), ICAR, were present as Guests of Honor. Dr. B. K. Das, Director highlighted the institute's achievements and contributions over the

past 77 years, focussing on enhancing fisheries in inland open waters, biodiversity conservation, stakeholder empowerment, and the integration of cutting-edge technologies like drones and sensor-based systems.





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Farmer Scientist Interaction on Fish Disease Surveillance

ICAR-CIFRI has organized two awareness programmes on fish disease surveillance and health management under the NSPAAD phase-II project funded by Pradhan Mantri Matsya Sampada Yojana



(PMMSY). The program was conducted at 4 No Bheri and Sardar Bheri, Kolkata, West Bengal on 16 and 17 April 2024, respectively. At 4 No Bheri, a total of 32 farmers including 14 women and 18 men participated in the programme, while at Sardar Bheri 48 farmers including 18 women and 30 men participated in the programme. Dr. B. K. Das, Director addressed the gathering and enlightened the fishers on several areas such as sustainable fish farming, disease and health management of fish, and the application of drone-based technology for disease management in East Kolkata Wetlands by spraying liquid medicine to reduce time and manpower.



IRC Meeting

Institute Research Committee (IRC) Meeting for the year 2023-24 was held during 22-25 April 2024 at the Institute headquarters. All the scientists of the headquarters as well as regional centers and stations attended the meeting and presented their achievements. The Member Secretary Dr. Arun Pandit

briefed the house regarding the current status of 21 institutional projects including two network projects during 2023-24. He informed that most of the institutional projects have been concluded by 31.03.2024. The Director and the Chairman IRC Dr. B.K. Das gave a brief overview of the recent developments in the research, and development works of the institute. He stressed that scientists should strive for product/patent/IPR/copyright/high impact publications signifying the institute's growth. He informed that from now onwards project-based budgeting will be followed where the expenditure in the project will be governed by the budget prescribed in the RPP1. The Chairman also suggested that the HODs should monitor the performance of the scientists and address their weakness and make efforts to convert their weakness into strength for developing synergy in research activities. He further advised the house to execute activities like Natural Farming, Atma Nirbhar Bharat, Viksit Bharat, and 100 days programme for the development in the inland fisheries sector.

Director, ICAR-CIFRI Visited Directorate of Fisheries, Government of Assam

Dr. B. K. Das, Director visited the Directorate of Fisheries, Guwahati, Assam, on 04 May 2024. He was accompanied by Dr. S. K. Majhi, Head, CIFRI Regional Centre, Guwahati; Dr. B. K. Bhattacharjya, Principal Scientist; Dr. A. K. Das, Principal Scientist; and Dr. Simanku Borah, Scientist of the Institute. A meeting was organized among the officials of the Department of Fisheries, Assam led by Mr. Gauri Shankar Das, Director of Fisheries, Government of Assam, and ICAR-CIFRI personnel with the



objective of deciding the plan of action and technical aspects of the Asian Development Bank's (ADB)-sponsored Sustainable Wetland and Integrated Fisheries Transformation (SWIFT) Project to be implemented by the Department of Fisheries, Assam.

Institute Scientists Visited Bichom Reservoir, Kameng HEP, West Kameng, Arunachal Pradesh



The Kameng Hydroelectric Project in West Kameng, Arunachal Pradesh, is developed by NEEPCO. The project comprises two components, one each at the Bichom and Tenga rivers, both of which are tributaries of the Kameng river. ICAR-CIFRI team, under the leadership of Dr. B. K. Das, Director, and Principal Investigator of the NEEPCO-sponsored consultancy project on "Planning and design of fish hatchery at Bichom dam site along with studies on reproductive biology of snow trout, *Schizothorax richardsonii*, for conservation and

artificial propagation in river Bichom, Arunachal Pradesh" visited the site on 03 May 2024.

Interactive Meeting with NABARD Officials

Scientists of ICAR-CIFRI Regional Centre, Guwahati, participated in an interactive meeting with officials of NABARD at their Regional Office, Guwahati, on 27 May 2024. Dr. S. K. Majhi, Head, Dr. S. C. S. Das, Senior Scientist, and Dr. Simanku Borah, Scientist from ICAR-CIFRI, and Shri Loken Das, CGM, NABARD, Assam Regional Office, Guwahati, Shri Nabin Kumar Roy, GM, NABARD, along with their team, participated in the interactive meeting. A host of issues, including possible collaboration between NABARD and ICAR-CIFRI for the development of the fisheries sector in North-East India, were discussed in the meeting. It was decided to focus on skill development of fish farmers and fishermen of the region by conducting trainings with active involvement of both the organizations.



World Environment Day

The institute celebrated the day on 05 June 2024 with a series of programmes in collaboration with the National Academy of



Agricultural Sciences, Kolkata Chapter. On World Environment Day, ICAR-CIFRI carried out a ranching program at Seoraphuli Ghat, followed by an awareness camp on plastic pollution. Under the "Namami Gange" program around 3.22 lakh fingerlings, including 3 lakh IMC, and 0.22 lakhs of indigenous fish, *Systomus sarana* (Olive Barb), were released into the River



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Ganga at Monirampore Ghat. 'Team-CIFRI' conducted a public awareness campaign on 'plastic waste' by involving local communities.



Input distribution-cum-Awareness programme for the Fish Farmers of Sikkim

The institute, in collaboration with the Department of Fisheries (DoF), Govt. of Sikkim, organized an awareness cum input distribution program in Gangtok, Sikkim, on 11 June 2024. Inputs such as FRP tanks and accessories for ornamental fisheries in the state were distributed among 52 beneficiaries in the 5 (Gangtok, Soreng, Geyzing, Namchi, and Mangan) districts of Sikkim under the SCSP and NEH programs of the institute. Ms. Roshni Rai, Secretary, DoF, Sikkim; and Mr. K. K. Shrestha, Director, DoF, Sikkim graced the occasion. The programme was also attended by the Director and Scientists from ICAR-CIFRI, Barrackpore; Secretary, DoF, Govt. of Sikkim; Director and Joint Director, DoF, Sikkim; DoF officials from all 5 districts; and fish farmers of Sikkim.

52nd Institute Management Committee Meeting

The 52nd Institute Management Committee (IMC) meeting was held at Barrackpore on 20 March 2024. Dr. B. K. Das, Chairman, IMC, and Director, ICAR-CIFRI, Barrackpore, briefed the house about the research and development activities being carried out in the institute since the last IMC meeting, overall institute management, and linkages established with others. The Chairman emphasized the initiative of “doubling the income of fishermen.” He also appraised the committee members on the successful completion of the 13th Indian Fisheries and Aquaculture Forum held during 23-25 February 2024 at Biswa Bangla Conclave, Kolkata.



Interaction Meeting at Rishia Dam, Odisha

On 05 April 2024, ICAR-CIFRI, Barrackpore, organized an interaction meeting to meet SDG 8 "Decent Work and Economic Growth" at Risia Dam, Kuldiha, Odisha. Dr. B. K. Das, Director, ICAR-CIFRI, and his team interacted with local fishermen and emphasized the need for sustainable climate-smart fisheries. The program was aimed at creating awareness of climate change and its deleterious impacts on reservoir fisheries and understanding the various problems faced by the local fishers under the “ICAR Window 3 program (WorldFish)”. The program was attended by 58 fishermen.



ICAR-CIFRI organised interactive meeting at Rishia Dam, Odisha for Livelihood Development of Tribal Community

International Women Day Celebration

The Institute organized the International Women's Day on 08 March 2024, at ICAR-CIFRI, Barrackpore, Kolkata, in which a brainstorming session on “Accelerate progress in economic empowerment of women in Inland Fisheries” was organized based



International womens day

and identifying the key research areas for the coming years. Dr. Das also highlighted notable accomplishments, including the publication of 109 research articles, 6 patents, 2 trademarks, and 7 copyrights, along with the signing of a few MOUs. The members of RAC, Dr. Madan Mohan, former ADG (marine fisheries), Dr. A. K. Singh, former Director, ICAR-DCFR, and Dr. B. P. Mohanty, ADG (inland fisheries), expressed their satisfaction with the overall research achievements of the institute. Dr. A. K. Sahoo, member secretary of RAC, formally gave a vote of thanks after successful completion of the meeting.

on the theme “Invest in Women: Accelerate progress”. All staff members of the institute have participated and contributed to the brainstorming session. The Chairperson Women Cell has delivered the welcome address, all the women staff have shared their experience, and Director ICAR-CIFRI has congratulated all female staff for their contribution to economic empowerment in the fisheries sector.

RAC meeting

The Research Advisory Committee Meeting of ICAR-CIFRI was held under the chairmanship of Dr. (Mrs.) B. Meenakumari, former DDG (Fisheries Science) during 15-16 March 2024. Dr. B. K. Das, Director, ICAR-CIFRI, warmly welcomed the Chairperson and members of RAC and delivered the opening remarks, expressing gratitude to the RAC for the research guidance



Other Major Events



Director addressing the audience in Moyna aqua expo on 06.01.24



Demonstration of drone used for sample collection in fisheries research at Moyna on 06.01.24



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Visit of Ms. Madhumita Basu, DG (Audit) and her team on 24.01.24;
The Director delivered a lecture on 'Blue economy' in the meeting with the CAG team



Ganga Arati by DG, NMCG on 11.02.24



Dissemination workshop on 12.02.24



Rabindra Jayanti on 08.05.24



Minister of Fisheries, WB Govt. visited hilsa rearing ponds at Kolaghat on 17.06.24



Review meeting of NePPA project on 20.06.24



International Yoga Day on 21.06.24



Workshop on application of online Hindi translation tools on 25.06.24



Visit of Shri Omprakash Prasad, Research Officer (Implementation), RIO Kolkata on 27. 06. 2024

Activities under Scheduled Caste Sub-Plan (SCSP)

Wetland fisheries development

The institute adopted four wetlands of West Bengal, viz., Akaipur, Maniknagar, Bijpur, and Kundipur for scientific management of fisheries and biodiversity conservation. The wetlands are located in the North 24 Parganas and Nadia districts of the state. FRP fishing boats equipped with outboard engines and CIFRI HDPE pens were distributed for enhancement of fish production in these wetlands.

Backyard pond fish culture and fish breeding

Backward ponds are ubiquitous in West Bengal, which can be efficiently utilized for fish culture to enhance their livelihood. The institute distributed 430 kg of IMC fingerlings and 5.15 tons of fish feed to 100 SC women for backyard pond fish culture. FRP hatchery was provided to the fishers of Kakdwip, South 24 Parganas of West Bengal. This initiative of establishing a fish seed production unit will benefit 100 Scheduled Caste families by increasing their fish production through easier availability of fish seeds.



Distribution of FRP boats



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Ornamental fish culture

The institute is promoting ornamental fish farming for strengthening the livelihood of poor fishers. Till now, 170 units were provided, which act as a startup unit for the ST and SC farmers to earn an alternate livelihood for the backward community of the hilly region of North Bengal. More than 60% of beneficiaries successfully adopted the ornamental fish culture practices. Continuing to this initiative, the ICAR-CIFRI, visited the ornamental fish culture clusters in North Bengal and encouraged them for further upliftment. The institute also distributed 163 ornamental fish culture units to the College of Fisheries, OUAT, Odisha, and four KVKs of Odisha-Bhadrak, Balasore, Nayagarh, and Puri for demonstration of ornamental fish culture.

Awareness cum input distribution programme for the fish farmers of Sikkim held at Gangtok, Sikkim



The Institute in collaboration with Department of Fisheries (DoF), Govt. of Sikkim organized an awareness cum input distribution programme in Gangtok, Sikkim on 11 June, 2024. Inputs such as FRP tanks, ornamental fish seeds (Goldfish and Koi carps), fish feed and all necessary accessories for development of ornamental fisheries were distributed among 52 beneficiaries in the 5 districts (Gangtok, Soreng, Geyzing, Namchi and Mangan) of Sikkim under the SCSP and NEH programme of the institute. The programme was attended by 50 participants including Director and Scientists from ICAR-CIFRI, Barrackpore; Secretary, DoF, Govt of Sikkim; Director and Joint Director, DoF, Sikkim; DoF officials from all the 5 districts and fish farmers of Sikkim.

Distribution of ornamental fish culture kits



Dr. B. K. Das, Director, ICAR-CIFRI discussed about the importance of ornamental fisheries in the state. Ms. Roshni Rai, Secretary, DoF, Govt. of Sikkim appreciated ICAR-CIFRI for supporting ornamental fish farmers of the state and create awareness among the farmers how ornamental fisheries can be additional sources of income along with food fish farming. Sri Lobsang Tamang, Joint Director, DoF, Sikkim also expressed his gratitude to ICAR-CIFRI for supporting the

ornamental fish farmers of Sikkim by giving inputs for

ornamental fisheries start-up. A technical session was conducted by the Scientists of ICAR-CIFRI for discussing ornamental fisheries setup, breeding of ornamental fishes and fish health management.



Distribution of ornamental fish culture kits at Gangtok



Amur Carp seed distribution in Darjeeling

Promotion of Amur Carp culture in Darjeeling district of West Bengal

The Institute is promoting the Amur Carp fish farming in Darjeeling district of West Bengal. An awareness and input distribution programme were organized at Sittong on 9 June 2024 in which 50,000 Amur Carp seeds were distributed among the 50 beneficiaries in collaboration with Sittong Multi Agro Cooperative (REH).

Distinguished Visitors

- Dr. B. P. Mohanty, ADG (Inland Fisheries), New Delhi visited ICAR-CIFRI on 16 January 2024
- Dr. Himanshu Pathak, Secretary, DARE, and DG, ICAR, and Dr. J. K. Jena, DDG (Fisheries Science), visited ICAR-CIFRI, Barrackpore, on 19 January 2024.
- Ms. Madhumita Basu, Deputy CAG. O/O, CAG, New Delhi, visited the institute on 24 January 2024. Ms. Debolina Thakur, DG, Central Audit, Kolkata, also accompanied her.
- Dr. Sandeep Behera, Sr. Consultant, Biodiversity, NMCG, Proj. (Dr.) B. B. Jana, University of Kalyani, Prof. (Dr.) Ashis Kumar Panigrahi, Pro-Vice Chancellor, University of Burdwan, West Bengal, visited the institute on 02 February 2024.
- Shri G. Asok Kumar, IAS, former DG, NMCG, and Dr. Sandeep Behera, senior biodiversity consultant at NMCG, visited ICAR-CIFRI on 11 February 2024.
- Dr. B. Meenakumari, Former Deputy Director General (Fy. Sc.), ICAR; Dr. B. P. Mohanty, ADG (Inland Fisheries), ICAR; Prof. Gautam Saha, Vice Chancellor of BCKV; Dr. Pradip Dey, Director of ICAR-ATARI; Dr. A. K. Singh, Former Director of ICAR-DCFR; and Dr. Madan Mohan, Former ADG (Marine Fy.) visited the institute headquarters on 17 March 2024.
- Shri Santosh Das, Additional Secretary and Director, Fisheries, Govt. of Tripura, paid a visit to the institute on 04 April 2024.
- Shri Omprakash Prasad, Research Officer, Rajbhasha Vibhag, Ministry of Home Affairs, Kolkata, visited the institute on 27 June 2024.



Ms. Madhumita Basu (at the middle), and Ms. Debolina Thakur (at the extreme right)



Dr. H. Pathak (at the middle) and Dr. J. K. Jena (at the right)



Dr. B. Meenakumari, Dr. B. P. Mohanty, Dr. A. K. Singh and Dr. Madan Mohan (serially from right to left)



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अनुसंधान उपलब्धियां

क्रायोप्रिजवर्ड मिल्ट के उपयोग से हिल्सा का सफल प्रजनन

संस्थान ने वन्य (वाइल्ड) परितंत्र से एकत्रित क्रायोप्रिजवर्ड मिल्ट का उपयोग करके हिल्सा का सफलतापूर्वक प्रजनन किया। देखा गया है कि वन्य परितंत्र से एक समय में नर और मादा दोनों मछलियों को प्राप्त करना आसान नहीं होता है, इसलिए इस प्रजाति के मिल्ट का क्रायोप्रिजर्वेशन और जीन बैंक के विकास की आवश्यकता पड़ती है। संस्थान पिछले 10 वर्षों से परिषद के अन्य मात्स्यिकी संस्थानों के सहयोग से तालाबों में हिल्सा मछली पालन और प्रजनन के लिए काम कर रहा है। हिल्सा प्रजनन की दिशा में यह अपनी तरह की पहली तकनीक है। अध्ययन रिपोर्ट से यह एक आशा की जा रही है कि तालाबों में हिल्सा मछली उत्पादन से इसके संरक्षण के साथ-साथ इसकी कम उपलब्धता की समस्या को दूर होगी तथा इसका प्रेरित प्रजनन जल्द ही संभव हो सकेगा।

एस. सामंत, एस. रॉय, आर. चक्रवर्ती, एस. माइती, आर. के. मन्ना, ए. के. साहू और बि. के. दास

नदियों की तुलना में पोखर में हिल्सा मछली का बेहतर विकास

आईसीएआर-एनएसएफ परियोजना चरण-II का प्रमुख उद्देश्य हिल्सा ब्रूडस्टॉक का विकास करना था। इस दिशा में, किशोर हिल्सा को विभिन्न तालाबों में पाला गया— जैसे पश्चिम बंगाल के राहरा में मीठा जल क्षेत्र (ICAR-CIFA), काकद्वीप में खारे पानी का क्षेत्र (ICAR-CIBA) और कोलाघाट, मिदनापुर पूर्व, पश्चिम बंगाल में जामित्या गाँव में मध्यवर्ती क्षेत्र (ICAR-CIFRI)। कोलाघाट में ब्रूडस्टॉक तालाबों को गंगा की एक सहायक नदी, रुपनारायण से पानी प्राप्त होता है। वहां सभी दो तालाबों में हिल्सा मछली का बेहतर विकास और अतिजीविता दर दर्ज किया गया। हाल के रिपोर्ट के अनुसार, कोलाघाट में 689 ग्राम (43.6 सेमी) की एक हिल्सा मछली दर्ज की गई और यह विकास पिछले 3 वर्षों के पालन से प्राप्त हुआ है।

एस. सामंत, आर. के. मन्ना, आर. चक्रवर्ती, एस. माइती, ए. के. साहू और बि. के. दास

ब्रह्मपुत्र प्रवाह तंत्र से एक नई मछली प्रजाति, *ऑप्सेरियस सियांगी* को दर्ज किया गया

संस्थान के सर्वेक्षण दल ने अरुणाचल प्रदेश की सियांग नदी में एक नई मछली प्रजाति, *ऑप्सेरियस सियांगी* की पहचान की है। इस प्रजाति की पहचान *ऑप्सेरियस सियांगी* (<https://doi-org/10.1080/24701394.2024.2310279>) नामक एक संभावित नई प्रजाति के रूप में की गई है। इस नई प्रजाति में विशिष्ट शारीरिक लक्षण पाए गए जैसे, पार्श्व भाग में 65–77 शल्क, अग्र-पृष्ठीय भाग में 32–39 शल्क, पृष्ठीय पंख मूल और पार्श्व रेखा के बीच स्थित 12–15 शल्क, दो जोड़ी बारबेल तथा शरीर को सुशोभित करने वाली 8–15 ऊर्ध्वाधर पट्टियां आदि। यह विवरण सियांग नदी पारिस्थितिकी तंत्र के जैव विविधता को दिखाता है।

कविता कुमारी, सिमांकु बोराह, संगीता एम. नायर और सुरेश बी. आर

नर्मदा नदी के स्वदेशी मछली प्रजातियों को पकड़ने के लिये क्राफ्ट और गियर जाल

संस्थान द्वारा मध्य प्रदेश में नर्मदा नदी के ऊपरी और मध्य खंड में एक सर्वेक्षण से नर्मदा नदी में संचालित मछली पकड़ने के विभिन्न क्राफ्ट और गियर जाल का पता चला है। इनमें लकड़ी की नावें (जिन्हें स्थानीय रूप से डोंगा या नाव कहा जाता है), टिन/एल्यूमीनियम से बने नावें (जिन्हें स्थानीय रूप से किस्ती के रूप में जाना जाता है) और फुलाए हुए टायर ट्यूब आते हैं। नर्मदा नदी के मध्य खंड में मुख्य रूप से ट्यूब से मछली पकड़ा जाता है। इन मछली पकड़ने के क्राफ्ट का इस्तेमाल अधिकतर गिल नेट संचालन के लिए किया जाता है। मछली पकड़ने के गियर जाल में गिल नेट, ट्रामेल नेट, कास्ट नेट, ड्रैगनेट, स्कूप नेट, हुक और लाइन प्रमुख हैं। पकड़ी गई मछलियों में मुख्यतः सबसे प्रचलित प्रजातियाँ *रीता रीता*, *क्लूपिसोमा गरुआ*, *टोर पुटिटोरा*, *टोर टोर*, *सिस्टोमस सराना*, *लेबियो डायोचिलस*, *लेबियो बोगट*, *लेबियो बोगा*, *लेबियो गोनीयस*, *मास्टेसेम्बेलस आर्मेडस*, *लेपिडोसेफालिचथिस गुंटिया*, *लेबियो कैटला*, *लेबियो रोहिता*, *चन्ना मारुलियस*, *सिरिनस मृगाला*, *पुंटियस सोफोर*, *टिक्टो पेथिया* और *साइप्रिनस कार्पियो* आदि देखी गई।

कैसियाल जे., डी. भक्ता, पी. गोगोई, मितेश एच. रामटेके, एस. के. मन्ना, एस. कांबले और बि. के. दास

गर्मी के मौसम में रामगंगा नदी के जल गुणवत्ता का आंकलन

रामगंगा नदी गंगा की एक सहायक नदी है जो उत्तराखंड के मध्य हिमालय में दूधातोली क्षेत्र से निकलती है और उत्तर प्रदेश के फर्रुखाबाद में गंगा नदी में मिल जाती

है। मई 2024 में इस नदी के जलीय नमूने को पाँच स्थानों, अर्थात् चौखुटिया, मरचुला, कालागढ़, कटघर और हुल्लापुर से एकत्र किए गए। पानी का तापमान 21.7 से 29.7 डिग्री सेल्सियस, पीएच 7.7 से 9.0, घुलित ऑक्सीजन 3.6 से 8.2 मिलीग्राम/लीटर, टीडीएस 135 से 369 मिलीग्राम/लीटर, विद्युत चालकता 177.5 से 519 μ /सेमी, बीओडी 2.2 से 10.2 मिलीग्राम/लीटर और सीओडी 8 से 72 मिलीग्राम/लीटर जैसे महत्वपूर्ण जल गुणवत्ता मान पाए गए। जल का गंदलापन 9.46 (कालागढ़) से लेकर 450 एनटीयू (कटघर) तक था, जो 5 एनटीयू पेयजल दिशा-निर्देशों (बीआईएस, 2012) की अनुशंसित सीमा से ऊपर है। नदी में अपवाह द्वारा छोड़ी गई अपरदित मिट्टी की भारी मात्रा उच्च मैलापन का कारण थी। क्षारीयता और कठोरता क्रमशः 84 से 240 मिलीग्राम/लीटर और 84 से 144 मिलीग्राम/लीटर के बीच थी। कुल फास्फोरस और कुल नाइट्रोजन क्रमशः 0.58 से 2.31 मिलीग्राम/लीटर और 0.003 से 2.13 मिलीग्राम/लीटर के बीच थी। कटघर (मुरादाबाद) में दर्ज किए गए अधिकांश जल गुणवत्ता उच्चतम पाए गए जबकि मरचुला में सबसे कम थे। पर्वतीय क्षेत्रों (चौखुटिया और मरचुला) में जल गुणवत्ता अच्छी स्थिति में थी। अतः जल गुणवत्ता सूचकांक (WQI) के अनुसार रामगंगा नदी का जल पेयजल के तौर पर अनुपयुक्त पाया गया।

बि. के. दास, एन. ए. पारगी, एस. कुमार, यू. सिंह, डी. के. वर्मा, आर. ए. भट, ए. पटेल, संदीप कुमार, वी. कुमार, ए. आलम, वी. आर. ठाकुर, जे. कुमार और डी. एन. झा

हुगली-मातलह मुहाने के निचले भाग में बंगाल छिपरे मछली की बड़े पैमाने पर उपस्थिति

हुगली-मातलह मुहाने के बकखाली क्षेत्र में सर्दियों के दौरान बैगनेट और shore seine जाल के मछली पकड़ में बंगाल छिपरे मछली प्रजाति, *ब्रेविट्रीगॉन वाल्गा* की बड़े पैमाने पर उपस्थिति देखी गई। यह मछली समुद्री और खारे पानी में वास करती है। ये उष्णकटिबंधीय जल क्षेत्रों के तलछट में रहने वाली अभिगमन प्रकृति की मछली हैं तथा हिंद महासागर, बांग्लादेश से लेकर म्यांमार और पूर्वी भारत (बंगाल की खाड़ी, मद्रास) तक पाई जाती है। इसकी बनावट डिस्कनुमा होने के साथ थोड़ा अंडाकार होता है तथा इनका ऊपरी भाग दबा हुआ होता है। इसके वक्ष भाग के शल्क गोल, इसका थूथन लंबा और आंख छोटी तथा धँसी हुई होती है। इसके चाबुक जैसी पूंछ में दो डंक होते हैं। ताजा मछली के डिस्क की पृष्ठीय सतह और पैल्विक पंख दोनों समान रूप से भूरे या धूसर रंग के होते हैं। इसका बाहरी किनारा थोड़ा हल्का भूरा होता है, और इसकी डिस्कनुमा पूंछ धुंधले रंग की होती है। बंगाल छिपरे एक बहुत छोटी प्रजाति, है जो हुगली-मातलह मुहाना प्रणाली में वास करती है। वर्गीकरण संबंधी मुद्दों के कारण इसकी वास्तविक सीमाक्षेत्र सम्पूर्ण तौर पर ज्ञात नहीं है और इसे लघु मत्स्य पालन माना जाता है। यह प्रजाति अंतर्ज्वरीय क्षेत्रों और 40 मीटर से कम गहरे अन्य समुद्रों में व्यापक रूप से पाई जाती है। स्थानीय मछुआरों के अनुसार, इलास्मोब्रांच एक लक्षित प्रजाति नहीं है, बल्कि इन्हें मुख्य रूप से अन्य मछलियों के साथ आकस्मिक तौर पर पकड़ा जाता है। हाल के सर्वेक्षण में मुहाना प्रणाली के बकखाली क्षेत्र में छोटे आकार के बंगाल छिपरे मछली प्रचुर तौर पर पाई गई है। यह मछली अभिगमन प्रकृति की होती है इसलिए हुगली-मातलह मुहाने का निचला हिस्सा इनके प्रजनन के लिए अनुकूल है। आईयूसीएन रेड लिस्ट के अनुसार, *बी. वाल्गा* को संकटप्राय के रूप में वर्गीकृत किया गया है अतः इस मछली को अवांछित पकड़ से बचाने के लिए पर्याप्त देखभाल की आवश्यकता है।

दिबाकर भक्त, बि. के. दास, सौरव नंदी, आर्चिस्मान रे और सूरज के. चौहान

भारतीय सुंदरबन में कृत्रिम सब्सट्रेट पर हाइड्रोइड वन और समुद्री एनीमोन: सहभोजिता बनाम प्रतिस्पर्धी अवरोध

सुंदरबन क्षेत्र में हाल ही में किए गए सर्वेक्षण के दौरान यह देखा गया कि यूडेंड्रियम कैलिफोर्निकम टॉरे, 1902 और बोगेनविलिया फुलवा अगासीज़ और मेयर, 1899 से भरपूर हाइड्रोइड वन्य क्षेत्र में रस्सी, तैरते हुए लोहे की जेटी, पेड़ की मृत शाखाओं आदि जैसे विभिन्न जलमग्न सब्सट्रेट पाए गए। हाइड्रोइड वन्य क्षेत्र के अलावा, इस सब्सट्रेट को समुद्री एनीमोन, डायड्यूमेन लिनेटा (वेरिल, 1869) द्वारा उनके वासस्थल, प्रजनन स्थल और नर्सरी मैदानों के रूप में उपयोग किया जाता है। यद्यपि इस प्रजाति को भारत के पूर्वी तट से दर्ज किया गया है पर विशेष रूप से सुंदरबन बायोस्फीयर रिजर्व (एसबीआर) में *डी. लिनेटा* की उपस्थिति यहाँ लगभग 2,000 प्रजाति विविधता को दर्शाता है। समुद्री एनीमोन का अधिकतम घनत्व काकद्वीप में देखा गया, जो एक मध्यम लवणता (2.2-10.8 पीपीटी की) वाला क्षेत्र है। यह देखा गया है कि हाइड्रोज़न शुरु में जलमग्न रस्सियों या अन्य कठोर सब्सट्रेट पर आकर बस जाते हैं, और उनके द्वारा स्रावित बलगम सब्सट्रेट में गाद और रेत को चिपकाने में सहायता करता है, जिससे समुद्री एनीमोन से जुड़ने और पनपने के लिए उपयुक्त है। हालांकि, ऐसे सब्सट्रेट भी देखे गए जिनमें हाइड्रोइड की मौजूदगी के बिना समुद्री एनीमोन का संक्रमण घनत्व अधिक था। इससे समुद्री एनीमोन द्वारा हाइड्रोइड के विकास के लिए संभावित प्रतिस्पर्धी अवरोध का पता चलता है।

रंजन के. मन्ना, आर्य सेन, दिबाकर भक्त, शुभेंदु मंडल, संगीता एम. नायर, अभिजिता सेनगुप्ता, श्रीकांत सामंत और बसंत कुमार दास

मिस्टस प्रजाति के संपूर्ण जीनोम आकार का अनुमान

मिस्टस प्रजातियाँ बैग्रीडे परिवार की एक छोटी देशी कैटफिश है जो बहुत ही लोकप्रिय होती हैं। मछली के आर्थिक महत्व की वृद्धि तथा प्रजनन के लिए रेफरेंस जीनोम का निर्माण अति आवश्यक है क्योंकि प्रजाति या प्रजाति समूहों की संरचनात्मक, कार्यात्मक, जीव संबंधी और विकासवादी विशेषताएँ आदि संपूर्णतः जीनोम सीक्वेंसिंग पर निर्भर करता है। जीनोम सीक्वेंसिंग के अंतर्गत जीव की न्यूक्लियोटाइड संरचना, जीनोम की लंबाई या आकार, जीसी सामग्री का अनुपात, प्रोटीन-कोडिंग जीन की जानकारी आदि क्षेत्र शामिल हैं। वर्तमान जांच में *एम. कैवसियस* और *एम. गुलियो* के जीनोम सीक्वेंसिंग के लिए इल्लुमिना नोवासेक 6000 नेक्स्ट जेनरेशन



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सिफरी समाचार

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सीक्वेंसिंग प्लेटफॉर्म का उपयोग किया गया। जीनोम अनुक्रमण के लिए *एम. कैवसियस* और *एम. गुलियो* के नमूने क्रमशः गंगा नदी और सुंदरबन डेल्टाई क्षेत्र से लिए गए थे। जीनोम आकार का आकलन जीनोमस्कोप V2 द्वारा किया गया था, और ड्राफ्ट जीनोम डेनोवो असेंबली को MaSuRCA का उपयोग करके तैयार किया गया था। कुल मिलाकर, प्रत्येक मामले में अनुक्रमण डेटा के 14 जीबी इल्युमिना रीड तैयार किए गए थे। *एम. कैवसियस* के लिए अनुमानित संपूर्ण जीनोम आकार 0.752 जीबी और *एम. गुलियो* के लिए 0.665 जीबी दर्ज किया गया। समस्त जीनोम की पूर्णता का आकलन के लिए BUSCO का उपयोग किया गया था।

सुब्रा रॉय, पी. के. परिदा, विकास कुमार, असीम कुमार जाना, राम्या वी. एल., दिबाकर भक्त, बिजय कुमार बेहरा और बसंत कुमार दास

मिस्टस एसपीपी का आनुवंशिक स्टॉक लक्षण का वर्णन

आनुवंशिक स्टॉक की विशेषता निर्धारित करने के लिए बैग्रीडे परिवार की दो छोटी देशी कैटफिश प्रजातियों, *मिस्टस गुलियो* और *मिस्टस कैनवस* का उपयोग किया गया था। इसके लिए गंगा, ब्रह्मपुत्र, महानदी, कृष्णा, कावेरी नदियों और एक हैचरी से *एम. कैवसियस* के नमूने और गंगा, महानदी, पझायार नदियों और एक हैचरी से *एम. गुलियो* के नमूने एकत्र किए गए थे। *एम. कैवसियस* के माइटोकॉन्ड्रियल साइटब जीन के कुल 189 सीक्वेंस और *एम. गुलियो* के जीन के 116 सीक्वेंस NCBI (The National Center for Biotechnology Information) को जमा किए गए थे। वर्तमान अध्ययन में, *Cytb* क्षेत्र ने *एम. कैवसियस* के लिए 48 हैप्लोटाइप उत्पन्न किए। हैप्लोटाइप विविधता (एचडी) 0.488 से 0.935 तक दर्ज किया गया; सबसे अधिक एचडी गंगा नदी में देखी गई। इसी प्रकार *एम. गुलियो* में *Cytb* क्षेत्र ने 16 हैप्लोटाइप उत्पन्न किए, जिसमें Hd 0.225 से 0.855 तक था। गंगा नदी में देखी गई हैप्लोटाइप विविधता की सबसे अधिक देखी गई। पदानुक्रमित जीन विविधता के अनुसार कुल भिन्नता का एक उच्च अनुपात मछलियों की संख्या भिन्नता के कारण थी। *CYTB* क्षेत्र के आधार पर *एम. कैवसियस* और *एम. गुलियो* के लिए हैप्लोटाइप मीडियन-जॉइनिंग नेटवर्क के कारण हैप्लोटाइप वितरण और बारंबारता में महत्वपूर्ण अंतर दर्ज किए गए।

सुब्रा रॉय, प्रणय कुमार परिदा, विकास कुमार, असीम कुमार जाना, राम्या वी.एल., दिबाकर भक्त, सिमकू बोराह, नीति शर्मा, बिजय कुमार बेहरा और बसंत कुमार दास

तमिलनाडु के सथानूर जलाशय में लक्षित मुलेट मछली प्रग्रहण के माध्यम से मछली पकड़ में वृद्धि की संभावना

तमिलनाडु स्थित सथानूर जलाशय (2000 हेक्टेयर का क्षेत्र) के मत्स्य पालन का मूल्यांकन पकड़ संरचना अनुमान के लिए किया गया था। जलाशय की व्यावसायिक मछली पकड़ में भारतीय मेजर कार्प का प्रभुत्व देखा गया क्योंकि मछुआरे 180 मिमी से अधिक जाल आकार वाले मोनोफिलामेंट जाल द्वारा कार्प का पालन करते हैं। मानसून में बहु-आकार के मोनोफिलामेंट गिल नेट का उपयोग द्वारा प्रायोगिक मछली पकड़ से जलाशय में कुल 32 प्रजातियों को दर्ज किया गया, जिनमें मुलेट, *राइनोमुगिल कोर्सुला* की प्रचुरता थी और जो कुल मछली पकड़ का 37.5% था। इस प्रजाति की औसत लंबाई 27.5 2.8 सेमी और वजन 210.8 15.6 ग्राम दर्ज किया गया। लगभग 40 मछुआरे परिवार अपनी आजीविका के लिए इस जलाशय पर निर्भर करते हैं। हालाँकि इस जलाशय में मुलेट प्रचुर मात्रा में हैं, लेकिन वाणिज्यिक पकड़ में इस मछली को नहीं रखा गया है। मुलेट प्रग्रहण द्वारा मछली पकड़ अधिक होने से मछुआरा समुदाय की आजीविका में सुधार के साथ उनके अतिरिक्त आय में वृद्धि हो सकेगी।

राम्या वी.एल., जेसना पी.के., प्रीता पणिक्कर, सोनालिका साहू और बि. के. दास

मैपीथेल जलाशय में हाइपोथाल्मिचथिस मोलिट्रिक्स (सिल्वर कार्प) के पिंजरे में पालन का परीक्षण

मैपीथेल जलाशय में *हाइपोथाल्मिचथिस मोलिट्रिक्स* (सिल्वर कार्प) का पिंजरे में पालन किया गया। इस अध्ययन के लिए $32-45 \pm 1-04$ ग्राम के औसत वजन और $15-3 \pm 0-86$ सेमी की औसत लंबाई वाले सिल्वर कार्प के अंगुलिका को लिया गया। मणिपुर में स्थानीय पिंजरा किसानों की भागीदारी के साथ चार स्टॉकिंग घनत्व, अर्थात्, 8, 12, 16 और 20 अंगुलिका प्रति घन मीटर में मछली पालन किया गया। प्रति पिंजरा ($6 \times 6 \times 4$ घन मीटर) में पानी की मात्रा (126 घन मीटर) में तीन बार परीक्षण किया गया। मछलियों को 2-3% शरीर के वजन पर 28% CP युक्त फ्लोटिंग फीड खिलाया गया। कम घनत्व पर स्टॉक की गई मछलियों का विकास प्रदर्शन उच्च स्टॉकिंग घनत्व पर स्टॉक की गई मछलियों की तुलना में अधिक था। ऐसे पिंजरों में जिनमें मछलियों का संचयन घनत्व 8 और 12 अंगुलिका प्रति घन मीटर था उनमें कम पालन अवधि में ही मछलियों का आकार 1 किग्रा तक पहुँच गई, हालाँकि उच्च स्टॉकिंग घनत्व पर बायोमास उच्च देखा गया। अतः यह सुझाव दिया जा सकता है कि शुरू में सिल्वर कार्प के अंगुलिका को 4 महीने के लिए 20 अंगुलिका प्रति घन मीटर पर पाला जा सकता है, जिसके बाद पालन अवधि को कम करने के लिए स्टॉकिंग घनत्व को 8 या 12 अंगुलिका प्रति घन मीटर तक कम किया जा सकता है।

एस. येंगकोकपम, पी. दास, डी. देबनाथ, बि. के. दास, टी. एन. चानू और एस. के. माझी

डोरी: असम के बराक घाटी के सोन बील में मछली पकड़ने का एक पारंपरिक जाल

“डोरी” एक पारंपरिक मछली पकड़ने का जाल है, जिसका इस्तेमाल असम के करीमगंज जिले के सोन बील में मछुआरों द्वारा व्यापक रूप से किया जाता है। यह एक बॉक्स ट्रेप है, जो बांस के फट्टों से बना होता है और जिसमें ‘वी’ आकार के इनलेट वाल्व और पीछे की तरफ ‘यू’ आकार का क्रॉस सेक्शन बना होता है। जाल का सामान्य चौड़ाई 0.5–0.6 मीटर और ऊंचाई 0.5–1.2 मीटर होता है, जिसे मजबूत बनाने के लिए नियमित अंतराल पर बांस के फट्टों को आड़े तौर पर जाता है। इसे बील के मध्यवर्ती क्षेत्रों में धीमी गति से बहने वाले पानी में लंबवत रूप से सेट किया जाता है। इसका मुंह पानी की धारा की ओर होता है, जहां गहराई आमतौर पर 0.4 से 0.8 मीटर तक होती है, मुख्य रूप से मानसून के दौरान। दो छोटे-जालीदार नायलॉन जाल, या बाना (बांस की विभाजित पट्टियाँ जो रस्सी से एक साथ बंधी होती हैं), प्रत्येक 3–3.5 मीटर लंबी और 1–1.5 मीटर चौड़ी होती हैं, इन्हें बील के मध्यवर्ती क्षेत्रों में 1.5–2.5 मीटर के बांस के खंभे का उपयोग करके लगाया जाता है। इन जालों/बानों को ‘V’ आकार के विन्यास में व्यवस्थित किया जाता है, जो संकरे सिरे पर 0.4–0.5 मीटर के अंतराल के साथ जाल की ओर पतला होता जाता है। ये जाल/बान मछलियों को जाल की ओर जाने में अवरोधक के रूप में कार्य करते हैं। इस जाल में पकड़ी जाने वाली प्रमुख मछलियों में *पुन्टियस एसपीपी.*, *चंदा एसपीपी.*, *मिस्टस एसपीपी.*, *मैक्रोग्नाथस एसपीपी.*, झींगा आदि शामिल हैं। औसतन मछली पकड़ 250 ग्राम से 3.5 किलोग्राम तक होता है। जाल की लागत आकार के आधार पर 350–1500 रुपये तक होती है और यह 2–3 साल तक टिकाऊ होता है।

एस. सी. एस. दास, ए. काकती, डी. देबनाथ, एस. के. माझी और बि. के. दास

असम के प्रदूषित आर्द्रक्षेत्र से एंटीबायोटिक प्रतिरोध जीन (एआरजी) का पता लगाना

इस अध्ययन का उद्देश्य असम के कामरूप (एम) में प्रदूषित बोरसोला आर्द्रक्षेत्र के तलछट के नमूनों से एआरजी की एक व्यापक प्रोफाइल बनाना था, जिसमें उच्च-थ्रूपुट अनुक्रमण और मेटाजीनोमिक्स विश्लेषण का उपयोग किया गया था। आर्द्रक्षेत्र के इनलेट, मध्य और आउटलेट क्षेत्रों से तलछट के नमूने एकत्र किए गए थे। कुल 100 एआरजी की पहचान की गई, जिसमें आर्द्रक्षेत्र के इनलेट और मध्य बिंदुओं में अधिकतम एआरजी थे, जिससे मल्टीड्रग प्रतिरोध जीन की उपस्थिति का पता चला। ARGs को टेट्रासाइक्लिन (Tet), मैक्रोलाइड-लिंकोसामाइड-स्ट्रेप्टोग्रामिन (MLS), $<0 \times CF><0 \times 80>$ -लैक्टम (bla), एमिनोग्लाइकोसाइड (AGly), फेनिकॉल (phe), और सल्फोनामाइड (Sul) जैसे विभिन्न प्रकार के एंटीबायोटिक समूहों के प्रति प्रतिरोधी पाया गया। सभी स्थलों में जीन *sul4*, *sul2*, *sul1*, *arr2*, *blaGES-1*, *strB*, *strA* और *aadA1-pm* के प्रमुखता देखी गईं, जबकि इनलेट साइट पर *tetC*, *erm* (40), और *aac2-lb* जैसे जीन प्रमुख थे। मध्य साइट में *catQ* *vkSj* *blaNPS&1* जीन आउटलेट साइट में *tet(34)* और *blaACT-16 S5* जीन प्रमुख थे। *ई. कोली*, *पी. एरुगिनोसा*, *के. निमोनिया*, *एस. ऑरियस*, *एंटेरोबैक्टर एसपीएस* और कुछ गैर-संवर्धित बैक्टीरिया के लिए सबसे अधिक प्रतिरोधी सूक्ष्मजीवों की बहुतायत दर्ज की गई। यह अध्ययन शहरी आर्द्रभूमि वातावरण में एआरजी की वृद्धि पर प्रकाश डालता है और सार्वजनिक स्वास्थ्य की रक्षा के लिए एंटीबायोटिक दवाओं और उत्सर्जन के उपयोग के नियंत्रण की ओर ध्यान आकर्षित करता है।

एन. शर्मा, वी. कुमार, एस. रॉय और बि. के. दास

दीपोर बील में आक्रामक प्रजाति, वर्मीक्यूलेटेड सेलफिन कैटफिश *टेरीगोप्लिचथिस डिसजंक्टिवस* की उपस्थिति

टेरीगोप्लिचथिस डिसजंक्टिवस, जिसे आमतौर पर वर्मीक्यूलेटेड सेलफिन कैटफिश के रूप में जाना जाता है, दक्षिण अमेरिका की एक मूल प्रजाति है, जो विशेष रूप से अमेज़न नदी बेसिन और पेरू, इक्वाडोर, ब्राजील और कोलंबिया में विभिन्न नदियों में पाई जाती है। इनका शरीर मजबूत और मुंह चूसकनुमा होता है। वे मुख्य रूप से शाकाहारी होते हैं, जो शैवाल और पौधों के पदार्थों को खाते हैं और अपने विशेष मुंह के अंगों का उपयोग करके सतहों से खुरचते हैं। हाल ही में, असम के एकमात्र रामसर स्थल दीपोर बील से एक नमूना एकत्र किया गया है। दीपोर बील में इस आक्रामक प्रजाति की उपस्थिति बील पारिस्थितिकी तंत्र के लिए एक गंभीर चिंता का विषय हो सकती है, क्योंकि इसे स्थानीय पारिस्थितिकी तंत्र को बाधित करने और संसाधनों के लिए देशी प्रजातियों से प्रतिस्पर्धा क्षमता के कारण आक्रामक माना जाता है।

एस. बोराह, प्रीतम दास, बी.सी. रे और एस.के. माझी

धूमन (smoking) के माध्यम से छोटी देशी मछलियों का मूल्य संवर्धन

आमतौर पर यह देखा गया कि धूमन (smoking) का जीवाणुनाशक और एंटीऑक्सीडेंट गुणों के साथ-साथ इससे वस्तुओं को लंबे समय अच्छा रखा जा सकता है। नर्मदा नदी में, विशेष रूप से इसके ऊपरी और मध्य भाग में, मछुआरों ने इसे इस प्रक्रिया द्वारा करके अपनी एकत्रित मछलियों का मूल्य संवर्धन किया है। मछलियों को पकड़ने के बाद, गृहिणियाँ आमतौर पर धान और लेमनग्रास के भूसे का उपयोग करके छोटी मछलियों को धुएं (मछली के आकार और मात्रा के आधार पर 0.5 – 2.0



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घंटे के लिए रखती हैं। आमतौर पर धूमन के तहत स्मोकड मछली तैयार करने के लिए *पुंटियस एसपीपी.*, *पेथिया एसपीपी.*, *गर्रा पीपी.*, *चन्ना एसपीपी.*, *साल्मोफेसिया बेकेला*, *ओस्टियोब्रामा कोटियो*, *सिस्टोमस सरना*, *बोटिया डारियो*, *लेपिडोसेफालस गुंटिया* आदि मछली प्रजातियों का उपयोग किया जाता है। इसे व्यक्तिगत उपयोग के अलावा स्थानीय क्षेत्र के मछली बाजार में बेचा जाता है। स्मोकड मछली की कीमत मौसम और इस्तेमाल की जाने वाली प्रजाति के अनुसार अलग-अलग (250 रुपये से 400 रुपये प्रति किलोग्राम तक) होती है। देखा गया है कि लगभग सभी महिला मछुआरे स्मोकिंग प्रक्रिया में शामिल होती हैं। मछुआरों के अनुसार, स्मोकड मछली में औषधीय गुण होते हैं जिनका आकलन किया जाना चाहिए।

डी. भक्ता, सी. जॉनसन, पी. गोगोई, एम.एच. रामटेके, एस.पी. कांबले, एस.के. मन्ना और बि.के. दास

बिजनौर, उत्तर प्रदेश से गंगा नदी में मीठे पानी मैक्रोबेन्थोस, जोंक प्रजाति हेलोबडेला (एनेलिड्स) का पहला रिकॉर्ड

गंगा नदी के ऊपरी और मध्य हिस्सों में मैक्रो-बेन्थिक जीवों के वितरण, प्रचुरता और मौसमी भिन्नता का अध्ययन करते समय, सर्दियों के मौसम के नमूने के दौरान, क्लास-क्लिटेलाटा, ऑर्डर-राइन्कोबडेलिडा और परिवार-ग्लोसिफोनीडे से संबंधित मीठे पानी की "दो आंखों वाली सपाट" जोंक (हेलोबडेला प्रजाति) को पहली बार बिजनौर में गंगा नदी के मध्य हिस्सों से दर्ज किया गया था। हेलोबडेला शिकारी प्रवृत्ति के होते हैं और आमतौर पर गैस्ट्रोपोडा (लिम्नेया एक्यूमिन्टा) और जलीय कशेरुकियों, यानी मछली और उभयचरों के मृत शवों को खाते हैं।

वी.आर. ठाकुर, एस.के. वर्मा, यू. सिंह, एस.के. मिश्रा, डी.एन. झा, ए. अबसार, वी. कुमार, जे. कुमार और बि. के. दास

गंगा नदी में शीतजल प्रजाति, साइज़ोथोरैक्स रिचर्डसनी का विस्तार: जलवायु परिवर्तन का संभावित प्रभाव

तापमान में परिवर्तन, वर्षापात और प्राकृतिक आपदाओं के कारण शीत जल प्रजातियों के आवास और अतिजीविता महत्वपूर्ण रूप से प्रभावित हो सकती है। भारत में हिमालय क्षेत्र में व्यापक रूप से पाई जाने वाली एस. रिचर्डसनी प्रजाति आमतौर पर 300 से 2810 (MSL) की ऊँचाई पर पाई जाती है। एस. रिचर्डसनी तापमान में होने वाले कई तरह के बदलावों को झेल सकता है, लेकिन इसके लिए उपयुक्त जलवायु प्राचल, तापमान 8°C से 22°C तक, जल प्रवाह 2.8–4 m/l, पी एच स्तर 7.4 और घुलित ऑक्सीजन 8.2 से 8–10 मिलीग्राम प्रति लीटर वाले बर्फ से भरे मूसलाधार जलधाराओं और तालाब हैं। बिजनौर से साइज़ोथोरैक्स रिचर्डसनी की उपस्थिति ठंडे पानी की मछली की प्रजाति के ऐसे क्षेत्र में पाए जाने की पहली रिपोर्ट है, जहाँ पर्यावरणीय परिस्थितियाँ इसके मूल उच्च-ऊँचाई वाले आवासों से काफी अलग हैं। उच्च तापमान और अलग जल रसायन विज्ञान की विशेषता वाले क्षेत्र बिजनौर में उनकी उपस्थिति, उनके वितरण में उल्लेखनीय बदलाव का संकेत देती है, जो संभवतः बदलती जलवायु परिस्थितियों के कारण है। ऐसे क्षेत्र में एस. रिचर्डसनी की यह पहली रिपोर्ट प्रजातियों पर दीर्घकालिक जलवायु प्रभाव को समझने के लिए निरंतर निगरानी और अनुसंधान की आवश्यकता है।

ए. आलम, आर. ए. भट, डी. एन. झा, वी. आर. ठाकुर, वी. कुमार, एस. के. मिश्रा और जे. कुमार

गंगा नदी में मछली पकड़ने के लिए अंधाधुंध कीटनाशकों का उपयोग: एक चिंता का विषय

हाल ही में किए गए एक सर्वेक्षण में पाया गया है कि मछुआरे गंगा में क्रस्टेशियन और अन्य जलीय जीवों/मछलियों को पकड़ने में कीटनाशकों के सिंथेटिक पाइरेथ्रोइड का उपयोग कर रहे हैं। पश्चिम बंगाल में गंगा के निचले हिस्से में मछुआरे बड़े पैमाने पर कीटनाशकों का इस्तेमाल करते हैं, जिसका लक्ष्य विशाल मीठे पानी की झींगा प्रजाति *मैक्रोब्रैकियम एसपीपी* को पकड़ना है। उच्च ज्वार के दौरान जब जल स्तर बढ़ जाता है, तो अवैध तौर पर मछुआरे नदी में रसायनों को डालते हैं। मछली पकड़ने का काम नदी के किनारों के करीब 4–5 घंटे तक चलता है, जहाँ प्रवाह आमतौर पर मध्य चैनल से कम होता है। यह प्रवृत्ति जलीय पारिस्थितिकी प्रणालियों को अंततः नुकसान पहुंचाता है और सभी जीवों को मार देता है। इससे मवेशियों, अन्य स्थलीय जीवों और स्थानीय जलीय आबादी पर भी गंभीर प्रभाव पड़ता है। कीटनाशकों का उपयोग द्वारा पकड़ी गई मछलियाँ मानव उपभोग के लिए भी खतरनाक हो सकती हैं। जलीय वनस्पतियों और जीवों की रक्षा के लिए सरकार और पर्यावरण एजेंसियों द्वारा सख्त कार्य निर्देशों और योजनाओं की आवश्यकता है।

अजय साहा, अर्चिस्मान रे, विकास कुमार, कौशिक मंडल और बसंत कुमार दास

गंगा नदी में तलछट-बद्ध फॉस्फोरस का भू-रासायनिक प्रयोग: जैव उपलब्धता की स्थिति, प्रदूषण स्रोत और यूट्रोफिकेशन का प्रभाव

गंगा नदी की सतह तलछट में फॉस्फोरस के भू-रासायनिक अंश, जैव उपलब्धता और पारिस्थितिक जोखिम की जांच की गई। फॉस्फोरस गतिशीलता को बेहतर ढंग

से समझने के लिए, तलछट के फॉस्फोरस पूल वितरण जैसे विनिमय योग्य (Ex-P), एल्यूमीनियम बंधित (Al-P), लौह बंधित (Fe-P), कैल्शियम बंधित (Ca-P), और कार्बनिक रूप से बंधित फॉस्फोरस (Org-P) का अध्ययन करने के लिए अनुक्रमिक रासायनिक निष्कर्षण तकनीकों का उपयोग किया गया। सर्दियों को छोड़कर (345.68 ± 110.62 मिलीग्राम/किग्रा), मानसून पश्चात (319.20 ± 136.30 मिलीग्राम/किग्रा) और मानसून (288.63 ± 77.32 मिलीग्राम/किग्रा) की तुलना में मानसून पूर्व (438.49 ± 95.76 मिलीग्राम/किग्रा) में कुल फास्फोरस का उल्लेखनीय रूप से उच्च स्तर दर्ज किया गया और यह मुख्य रूप से अकार्बनिक फास्फोरस से बना था। कैल्शियम-बद्ध फास्फोरस तलछट में फास्फोरस का प्रमुख अंश था। उद्योग और घरेलू अपवाह और अपशिष्ट के साथ-साथ कृषि गतिविधियों जैसे स्रोतों का गंगा नदी में फास्फोरस की गतिशीलता पर प्रभाव पड़ता है। जैव-उपलब्ध फास्फोरस (Bioavailable phosphorus) तलछट में जैवउपलब्ध फास्फोरस अंशों ($37.8-46.0\%$) की पर्याप्त मात्रा की उपलब्धता को दिखाता है। यह जानकारी नदी पारिस्थितिकी प्रणालियों में फास्फोरस के भार को कम करने के लिए विभिन्न शमन तकनीकों को लागू करने के लिए उपयोगी हो सकती है।

अजय साहा, बि. के. दास, नितीश कुमार तिवारी, सूरज चौहान, चायना जाना, मितेश रामटेके, कैन्सियाल जॉनसन, राजू बैठा, हिमांशु शेखर स्वैन, अर्चिस्मान रे, सुभादीप दास गुप्ता, प्रणब गोगोई और तानिया कयाल

मछली किसान सब्जियों और फसल किसानों से अधिक दक्ष होते हैं

फार्मिंग सिस्टम विश्लेषण में तकनीकी दक्षता (TE) मॉडल का व्यापक रूप से उपयोग किया जाता है ताकि फार्मों की तकनीकी प्रदर्शन का अध्ययन किया जा सके। वर्तमान जांच में 2023-24 वर्ष में पश्चिम बंगाल और असम के 16 एफपीओ (फार्म प्रोड्यूसर ऑर्गनाइजेशन) के 320 सदस्य किसानों से एकत्र किए गए प्राथमिक डेटा का विश्लेषण किया गया है। अध्ययन में पाया गया कि मछलियों पालन की लागत सबसे अधिक थी, उसके बाद सब्जियों और फसलों का स्थान देखा गया। मछलियों में प्रति एकड़ लागत एक लाख रुपये से अधिक पाई गई। मछलियों में मुख्य लागत चारा था जबकि फसलों और सब्जियों के लिए मुख्य लागत मानव श्रम था। सभी फसल, सब्जी और मछलियों की पैदावार पश्चिम बंगाल में अधिक पाई गई। हालांकि, सब्जियों में शुद्ध मुनाफा असम में अधिक था क्योंकि वहां फार्म गेट कीमतें अधिक थीं। उत्पादन-इनपुट अनुपात मछलियों में सबसे अधिक था, उसके बाद सब्जियों और फसलों का स्थान था। यह पैटर्न दोनों राज्यों में समान था। डेटा एनवलपमेंट एनालिसिस (DEA) के अनुसार मछली पालन तकनीकी रूप से फसलों और सब्जियों से अधिक कुशल था। पश्चिम बंगाल में फसल और सब्जियों की औसत समग्र तकनीकी दक्षता क्रमशः 0.305 और 0.270 और असम में ये आंकड़े क्रमशः 0.176 और 0.438 थे। मछली किसानों में समग्र तकनीकी दक्षता पश्चिम बंगाल और असम में क्रमशः 0.762 और 0.731 थी। इसके अलावा यह पाया गया कि शुद्ध तकनीकी अक्षमता की तुलना में समग्र तकनीकी अक्षमता के लिए मुख्य रूप से स्केल अक्षमता जिम्मेदार थी। दक्ष फार्मों की सर्वोत्तम पद्धतियों को अपनाने से तकनीकी क्षमताओं में सुधार हो सकता है।

अरुण पंडित, बिस्वरूप साहा, एच.के. डे और अंजना एक्का

A FAO report (2023), based on household survey data of 58 countries/territories, found that around 60.2 million people were employed in the small-scale fishing value chain (part time and full together). Among them, 27.5 million employed directly in harvesting, with 14.6 million engaged in inland and 12.9 million in marine fisheries. Women made up 35 percent of the workforce. Further, Small-scale fisheries contributes at least 40 percent of the global catch from capture fisheries.

Source: <https://openknowledge.fao.org>

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