



DCFR



News

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FROM DIRECTOR'S DESK

The Directorate has completed twenty five years of its establishment and celebrated Silver Jubilee Year during 2012. In commemoration of the Silver Jubilee year, lecture series were organized which was followed by a **National Seminar on Mountain Fisheries: Challenges and Opportunity for Livelihood Security** during 5-6 November, 2012. The objective of the seminar was to address the issues, challenges and opportunities in hill fisheries and to draw action plans for enhancing the productivity in upland waters. Over the years, the institute has done commendable work both in basic and applied research. To highlight some of it are resource assessment using GIS, standardizing breeding protocol of some important cold water fishes, aquaculture diversification, nutrition profiling of indigenous species, development of different molecular markers for species characterization and population studies, feed development and disease surveillance. Besides research work, skill development of Tribals and Northeastern population was undertaken in a big way under TSP and NE programme. Impact assessment of Hydroelectric project on river Sutlej on fish fauna was undertaken in consultancy mode. The fundamental thought after transformation of the Institute from NRCCWF to DCFR has been to spread out the activities in the entire Himalayan region utilizing the resources and manpower of various state fisheries departments in collaboration mode. Directorate addressed these issues under different outreach programmes. I complement all my colleagues for the achievement made in spite of many hurdles. I also congratulate the editorial board to bring this publication.



A. Barat

(A. Barat)
Director (Acting)

Research highlights

A new loach (*Schistura obliquofascia*) identified from Uttarakhand, India.

A new loach, *Schistura obliquofascia* (Fig. 1) under the subfamily Nemacheilinae, family Balitoridae is described from Kalsa, a stream near Chanfi, district Nainital, Uttarakhand. The cyt b sequences of *Schistura obliquofascia* were successfully amplified and deposited in Genbank. The sequences were aligned with that of other *Schistura* species i.e. *S. beavani* and *S. corica* and *Schizothorax richardsonii* to reveal the phylogenetic relationship. Neighbour-Joining tree (NJ) of three species of *Schistura* and *Schizothorax richardsonii* as out group consisted of two divergent clusters (Fig. 2).

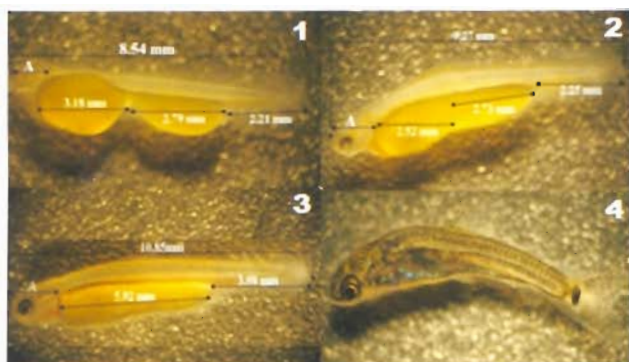


Schistura obliquofascia

NJ tree and genetic distance data suggest that *Schistura obliquofascia* was closer to *S. beavani* and distant from *S. corica*. The description along with photograph of the new species is published in Zootaxa 3586:255-263 (2012).

Breeding and larval development of chocolate mahseer, *Neolissochilus hexagonolepis*

Breeding and larval development of chocolate mahseer *Neolissochilus hexagonolepis* was undertaken successfully in the hatchery complex of DCFR, Bhimtal. The mature eggs and sperms were collected by stripping and then fertilized. The fertilized eggs were incubated in a flow through hatchery. The fertilized eggs were transparent, demersal, spherical, non-adhesive and brownish in colour with a diameter of 2.8 to 3.1 mm. Hatching started 40 h post-fertilization and completed



Larval developmental stages

1: 0 hours after hatching; 2: 24 hours after hatching;
3: 52 hours after hatching; 4: 16 days after hatching.

within 22 h at temperature of $22 \pm 2^\circ\text{C}$. Newly hatched larvae were 8.5 mm in length and devoid of mouth and pigmentation. The yolk sac was completely absorbed within sixteen days after hatching on attainment of 14.32 ± 0.26 mm total lengths. At the same time the digestive system became fully developed and larvae searched for feeding. To date, this is the first time larval development of chocolate mahseer is described. Thus, findings of the present study provide valuable information that may help establishing large scale seed production technique of chocolate mahseer.

Ornamental fish resources in river Dikrong and Chomko of Arunachal Pradesh

An explorative survey was undertaken in river Dikrong near Rono village of Arunachal Pradesh for assessing the ornamental fisheries resources. The dominant species caught were *Psilorichus arunachelenis*, followed by *Puntius sophore*. Other species caught were *Botia dario*, *Botia rostrata* (loaches) *Barilius barna*, *Chanda nama*, *Labeo gonius*, *Labeo pangas*, *Danio rerio*, *Esomus danricus*.

Sampling in Chomko river (also nick named as Ganga river) near B.N. colony was done through electric fishing. *Aborichthys kemp*i was the dominant species caught besides the *Botia dario* and *Botia rostrata*. Water quality parameters, length and weight of the specimens were recorded. Survey was also conducted in stretch of the river Teesta, 18 km away from Rango, situated at an elevation of 2300 feet in the Sikkim and Bakcha Chhu river, 24 km away from Gangtok at an altitude of about 2000 m. *Schizothorax progastus* (locally called as Chuchey Asala) and Garra species were recorded in river Teesta and the *Schizothorax richardsonii*, locally called as Donthey Asala, was found in river Bakcha Chhu.



Aborichthys kemp



Botia dario (loach)



Botia rostrata

Trout breeding and farming initiatives in Sikkim

The Directorate in collaboration with Department of Fisheries, Government of Sikkim took initiative to promote trout culture in the state under the project "Sustainable Utilization of Mountain Fishery Resources: A Partnership Mode". Brood stock management and seed production were taken on priority basis. As a result three trout breeding units were made functional for production of sufficient trout seed in order to stock in various Govt. farms and supply to the private farmers in the vicinity. The average growth of Rainbow trout was recorded as 500-600 gms in 8 months after stocking of fingerlings during the month of May, 2012 in the raceways of private farmers of Uttarey, Shree Badam and Upper Rimbi area of West Sikkim district. Farmers are getting good selling price i.e. Rs. 600-1000 per kg in the local market. Directorate has imparted the on farm training to department personnel and trout growers for raceway management, feeding, broodstock maintenance, trout breeding and health management. During training and demonstration programme on breeding 1,10,000 fertilized eggs were produced.

Directorate has developed a wooden stripping stand for easy operation and to minimise the physical injury to brooder during stripping. Stripping method using the stand and technology was demonstrated to the department personnel. The Scientists of DCFR also visited the Sarchok (Lachung) Govt. trout farm and some private trout farms of Sarchok, North Sikkim along with the officers of Fisheries department. The trout farmers of this area linked to the restaurants which facilitated them to get better price.

Scientists also attended the inaugural function of NFDB funded newly constructed Rainbow Trout Hatchery at Kyongnosola and Trout raceways at Baba Mandir near Memencho.

Scientists also interacted with Hon'ble Minister of Fisheries, Govt. of Sikkim and the Secretary, State Fisheries Department and discussed the activities of trout farming in the state. The Hon'ble Minister and Secretary have appreciated the efforts and Scientific & Technical guidance of Directorate for the development of trout farming in the state.



Stripping of mature female having 4.8kg body weight



Interaction with Hon'ble Minister and Secretary, Fisheries, Sikkim Govt.

Induced breeding of indigenous minor carp, *Labeo dero*

Labeo dero is a mid-distance coldwater migrant, bottom feeder fish, inhabiting in upland streams and rivers at an elevation of 400-800 m asl. This coldwater indigenous minor carp has high consumer preference as well as good market value. Successful breeding of this species was conducted at DCFR, Bhimtal in captivity under coldwater condition at 22.8°C temperature with optimization of synthetic hormone dose. Full maturity was observed during 2nd week of July to end of August. Hormone dose (OVAPRIM) of 0.8 ml kg⁻¹ body wt. for females and 0.4 ml kg⁻¹ body wt. for males was found optimum for spawning with 87% fertilization, 65% hatching and the incubation period of 20-28hrs. The size of fertilized eggs was recorded as 2.8mm and length of the hatchlings was noticed to be 3.4mm. This study would be helpful for seed production of this species for wild stock augmentation and species diversification in coldwater aquaculture.



Fertilised eggs of *Labeo dero*



Earthen poly tank nursery

In situ seed rearing of golden mahseer in floating cages at Bhimtal Lake and their ranching in Assam

Experiments were carried out for optimization of the condition for rearing of mahseer seed upto advanced fingerling in cages installed in Bhimtal Lake. Density of stocking and rearing periods were standardized. One thousand fingerlings were oxygen packed (40



Stocking of golden mahseer fry into cages



In situ cage reared haul of golden mahseer fingerlings

nos/6L pack) after proper conditioning and air lifted to Dighalipokhari, Guwahati, Assam for ranching purpose. Dighalipokhari is a historic pond in Guwahati which has connections to the streams falling to Brahmaputra River. Ranching was done on 3rd July, 2012 in the presence of more than 150 people including Director & other officials of Directorate of Fisheries, Govt. of Assam, Managing Director & other officials of Assam Fisheries Development Corporation and the Director, DCFR, Bhimtal. The people from the NGOs like Aranyak and ABACA were also participated in the ranching program. This ranching initiative was done under the NEH activity of this directorate to establish and/or restore the mahseer population.



Spawn of ornamental fishes

Breeding of ornamental fishes

Keeping in view the water and space availability the ornamental fish culture seems to be promising as an alternative source for economic benefit to the people of

hill region. Before introducing the activity to the farmers, breeding and culture of koicarp and goldfish was taken up at Directorate's farm. The koi carp of average length 155mm and average weight 125gm were grown to average length of 200mm and average weight of 160gm in polythene lined tanks in five months. Matured fishes were successfully induced-bred by Ovaprim injection. Breeding and larval rearing parameters were standardized. Moreover, it was observed that multiple breeding of koi carp is also possible.

Induced breeding and larval rearing of gold fish was also taken up successfully. The fingerlings of koi carp and goldfish is now ready for stocking in farmers' field.



Important Events

Farewell to Dr. P.C. Mahanta

Dr. P.C. Mahanta was superannuated on 31st December 2012 and Dr. A. Barat succeeded Dr P.C. Mahanta as Acting Director of DCFR Bhimtal on 31st December 2012.



Farewell to Dr. P.C. Mahanta on 31 Dec. 2012

Silver Jubilee year and National Seminar on 'Mountain Fisheries: Challenges and Opportunity for Livelihood Security'

The Directorate observed 2012-13 as the Silver Jubilee year and arranged a series of programmes to celebrate it. Silver jubilee lecture series and regional workshop were organized through out the year. Besides a two days national seminar on 'Mountain Fisheries: Challenges and Opportunity for Livelihood Security' was organized on 5-6 Nov. 2012 in commemoration of Silver Jubilee year of Directorate. The function was inaugurated with silver jubilee flag hosting by Honourable chief guest, Dr. K.L. Sehgal, the founder Director of the institute. It was followed by the inauguration of exhibition stall by Dr. S.A.H Abidi, Former ASRB member. Institutes like DCFR, CIFA, PDFMD, VPKAS, CIFT and CIFRI participated in the exhibition.

Dr. B. Meena Kumari, Honourable Deputy Director General (Fy.) ICAR, Govt. of India, chaired the inaugural session. Dr. P.C. Mahanta Director, DCFR welcomed all the dignitaries, participants and media persons from various corners of the country. In the inaugural session, 8 books & bulletins and 25 extension leaflets were released by various eminent scientists and subsequently

Coldwater Fishery Society of India (CFSI) was launched by Dr. S.P. Ayyar. The main objective of the seminar was to address the issues, challenges and opportunities in hill fisheries and to draw action plans for enhancing the productivity in upland waters for livelihood security in order to achieve these objectives the seminar was conducted in separate sessions in two days. The technical sessions were (i) **Recourse Assessment** (ii) **aquaculture** (iii) **Biotechnology & Fish health** (iv) **Water Management and conservation** (v) **Sport Fisheries and Eco-tourism** (vi) **Livelihood Security and Gender Issues**.

In concluding session the draft recommendation of the seminar was proposed by Dr. P.C. Mahanta and accepted after detailed discussion by the experts and participants. Dr. P.C. Mahanta was declared as the president of newly launched coldwater fisheries society of India and Dr. K.L. Sehgal was conferred as first fellow of the society. The national seminar was concluded with the vote of thanks by Dr. D. Sarma and ended with the national anthem. Besides the technical sessions, poster session was also organized and six prizes were distributed to the best poster presentation. Dignitaries, experts contributing the cold water sector and the retired persons of the DCFR were also felicitated in Silver Jubilee celebrations.



Inaugural lightening of lamp by Dr. B.Meenakumari, DDG (Fy.)

Institute Management Committee Meeting

The Institute Management Committee (IMC) meeting of the Directorate was conducted on 18 August 2012 under the chairmanship of Dr P.C. Mahanta, Director. Dr. S.D. Singh, Assistant Director General (Inland Fisheries), Dr. P. Punia, HOD, NBFGR, Lucknow, Dr. A. B. Pandey, Head, IVRI Station, Mukteshwar, Dr P.



Silver Jubilee Flag Hosting by Dr. K.L. Schgal (Founder Director)



Delegates at exhibition gallery



Release of publication

K. Agarwal, Principal Scientist & Head, VPKAS, Almora (Uttarakhand), Dr. Pradeep Katiha, CIFRI, Barrackpore, Shri S.R. Chanyal, Joint Director, Department of Fisheries Govt. Of Uttarakhand, Dehradun, Shri Farooq Nawchoo, Joint Director, Department of Fisheries, Govt. of J&K, Dr. Malavika Das, Professor, College of Fishery Science, GBPUAT, Pantnagar, Shri Ashish Srivastava, Finance & Accounts Officer, IVRI, Izatnagar Shri. Y.S. Dhanik, Member Secretary & Administrative Officer, DCFR attended the meeting. Scientists and other invitee members of DCFR, Bhimtal were also present in the meeting. During the meeting approval



IMC Meeting

of the proceedings of previous IMC meeting held on 17.03.2012 was confirmed. The members of the IMC were duly apprised about the status of the previous action taken on suggestions of previous IMC. Discussions in various agenda items related to purchase, infrastructure development etc. were held.

Independence day celebration

Flag hoisting ceremony was observed on the Independence Day. Dr P.C. Mahanta Director hoisted the National Flag in the presence of staff members and addressed them. He congratulated the staffs for successful management and appreciated the scientists for their achievements in different fields. He also emphasized to work in coordination with different coldwater states to have a better impact of our research.



Hindi Chetna Mas observed

The DCFR celebrated Hindi Chetna Mas during 1.9.2012 to 30.9. 2012. A function was organized on this occasion in which Chief guest Dr. P.C. Mahanta inaugurated the programme. During the programme different Hindi competitions like Essay writing, Debate and passage writing were organized among staff members of the institute to promote the use of Hindi in official work. All the winners were given prizes by Chief Guest.



Hindi Chetna Mas 1.9.2012 to 30.9.2012

Fish Farmers Day

Fish farmer's day was celebrated at Champawat field centre of Directorate on 10th July 2012. The programme was presided over by Dr. B. Meena Kumari, Deputy Director General (Fisheries), ICAR. Shri Shridhar Babu Addanki, IAS, District Magistrate, Champawat, Uttarakhand graced the occasion as Chief Guest and Dr. S.D. Singh, Assistant Director General (Inland Fisheries) addressed the gathering as Guest of Honour. Dr. P.C. Mahanta, Director, DCFR welcomed all the farmers, entrepreneurs, dignitaries and media persons.



Inaugural session of fish farmer Day



Dr. Meena Kumari, DDG in her inaugural address highlighted the importance of quality seed, nutritionally balanced feed and health management for the up scaling of hill aquaculture. Due to climate change the temperature of the environment is gradually increasing, therefore, water conservation is very crucial for sustainable fish farming activities in the hilly region.

Dr. S.D. Singh in his address emphasized upon the need of transfer of technology from the laboratory to land. District Magistrate, Champawat assured the gathering to provide all administrative support for development of fish farming in this area and he stressed upon need for training programme for the fish farmers at champawat center. An exhibition of the institute was also arranged on this occasion. Around 150 farmers and entrepreneurs participated and six farmers were honoured for their outstanding contribution in the coldwater aquaculture.

A lively farmer - scientist interaction meet was organized to solve the problems of farmers. The scientist panel consisting of Dr. S.K. Srivastava, Dr. D. Saran, Dr. N.N.pandey, Dr. Suresh Chandra, Dr. Prem kumar, Dr R.S.Patiyal and Dr. S. K. Gupta of DCFR, Bhimtal and Champawat centre participated in the interactive session to address the queries raised by the farmers. On this occasion seeds of Champa-1 and Champa-2 and Grass carp were distributed to the farmers of Champawat and Pithoragarh district.



Interaction with Farmers



Fish seed distribution among farmers

Dr. Meena Kumari, DDG also inaugurated the newly constructed farmer's training hall, laboratory and residential Block of the Champawat centre.

Review workshop on "Sustainable Utilization of Mountain Fishery Resources- a Partnership Mode"

The Directorate in collaboration with Faculty of Fisheries, Sher-e-Kashmir University of Agricultural Sciences & Technology of Kashmir organized 2-day workshop on "Sustainable Utilization of Mountain Fishery Resources- a partnership mode" on 8-9 September, 2012.

During the review workshop, deliberations were made on the progress of different programs taken up during XI 5-year plan and programmes to be taken up during XII five year plan. Dr. Tej Partap, Hon'ble Vice Chancellor of SKUAST-K, chaired the workshop as Chief Guest. Dr. P. C. Mahanta Director, DCFR presided over the meeting. Dr. P. C. Mahanta during his address emphasized upon the issues and constraints of coldwater fisheries development in India and strategies to be followed for its holistic growth. Among other dignitaries present were Dr M.H. Balkhi, Dr. S.A. Wani, Director Research, Dr. B. Hassan, Director, Research & Education, Dr.A. S. Kamili, Director, Extension Education, and Dr. F. A. Zaki, Registrar, SKUAST, Sh. R.K. Dogra, Director Fisheries Jammu & Kashmir, Sh. T.D. Bhutia, Jt. Director, Department of Fisheries, Sikkim, prominent scientists Dr. S.K. Das from Meghalaya, Dr. Rani Danze from Himachal Pradesh, Dr. Atul Borgohain, from ABACA, Assam and scientists of the Faculty of Fisheries, SKUAST-K. Dr. Balkhi highlighted the importance of coldwater/hill fisheries in the country, diversity of fishes in Jammu & Kashmir and need for conservation of fish fauna for nutritional security and poverty alleviation. Dr. Wani identified some of the thrust areas in coldwater fisheries and need for co-ordinated research. Dr. Tej Partap, Hon'ble Vice Chancellor of SKUAST-K spoke about the increasing demands of fish in the near future and emphasized on increasing the production and strengthening the marketing. He appreciated the linkage between DCFR and SKUAST-K and also suggested to further strengthen the institutional collaboration and linkage. Sh. R.K. Dogra, Director Fisheries, J&K informed about the progress made in trout farming in Jammu & Kashmir and stressed upon collaboration and integration with SKUAST-K which would be helpful for the development of coldwater fisheries.

Dr. Debajit Sarma, Principal Scientist, DCFR, Bhimtal presented the scientific achievement made by the Directorate during last 25 years with special emphasis through network project on "Sustainable utilization of mountain fishery resources- a partnership mode". The workshop concluded with a road map for future course of action on coldwater fisheries development of the country giving adequate attention for the conservation and production enhancement of coldwater fishes to meet future demand.



Interaction among the review partners

Training on Post Harvest Utilization and Value Addition of Trout and Carp

Two days training programme was organized jointly by **Central Institute of Fisheries Technology, Cochin** and **Directorate of Coldwater Fisheries Research** on "Post harvest utilization and value addition of trout and carp" at DCFR Field Centre Champawat on September 09-10, 2012. The programme was inaugurated by Shri S.C. Negi, 2nd in Command, Sashatra Seema Bal Champawat range. He emphasized on organizing such training for hilly women, unemployed youth and retired army soldiers, for additional income generation.

Dr. S.K. Srivastava, Scientist In-charge of the centre and co-coordinator of this training programme welcomed all the participants and briefed about the aim and objective of the training programme. Total about 70 woman participants, soldiers from SSB and unemployed youth participated in the training. Dr. George Ninan, Senior Scientist CIFT and Coordinator of the programme demonstrated the preparation of fish Pickle, fish cutlet, fish ball, fish fillet, fish roll and also demonstrated the use of fish wastes for making fish feed. A special session was devoted to processing and value addition of rainbow trout. Dr. Suresh Chandra Senior Scientist DCFR Field Center Champawat and Dr. Prem Kumar Sr. Scientist, Co coordinators of the programme along with team of CIFT helped in organizing various demonstration programme. Extension officers of state fisheries department, Govt of Uttarakhand, representatives of Krishi Viggyan Kendra,



Hands on Training of the participant under supervision of CIFT experts

Lohaghat, State District administration, food processing department, local people and media personnel were present during the training programme.

Training cum exposure visit for the tribal farmers Dunagiri, Almora under TSP programme

With an aim to empower tribal farmers through fish farming technology with special reference to polytanks aquaculture in upland areas, one day training cum exposure visit was organized at village Dudholi, Dunagiri, Almora on 29th September, 2012 under the Tribal sub project programme. Under the supervision of Dr R.S. Patiyal, Sr Scientist and Dr Suresh Chandra, Sr Scientist twenty-five participants from border villages namely Pangu, Rimjhim, Himkhola, Baiku, Sirkha, Gothi, Uttarakhand were imparted training on latest know-how on polytank fish culture incorporating suitable fast growing coldwater fish species. Shri Jeet Singh Bajani, a progressive farmer shared his experience on farming of various agricultural crops and water conservations methods and suggested participating farmers to form groups in order to get better earning from their agricultural produce. Participants were taken to a progressive farmer's field at village Dudholi, Dunagiri and were exposed to integrated farming practices. They also got first hand information about vermicomposting, rain water harvesting system developed by farmer considering local conditions and topography, seasonal fruits and vegetable cultivation in poly houses, drip



Training programme for tribal fish farmers at Dunagiri



Demonstration of fish polytank

irrigation, Napier grass cultivation on the embankments for controlling soil erosion and for feeding grass carp as well as livestock, fish culture in polytanks etc. Participants were highly encouraged to see the development at the farm.

Inauguration of Northeast Information Centre of DCFR, Bhimtal

Added to a new feather on its cap, Directorate of Coldwater Fisheries Research, Bhimtal has expanded its activities in the North East by creating a Northeast Information Centre at CIFRI building, Guwahati on 8 October, 2012. Sri Basanta Dasji, the Hon'ble Minister of Fisheries, Govt. of Assam inaugurated the centre. Dr. Dilip Kumar, former Director cum Vice Chancellor, Central Institute of Fisheries Education, Mumbai and Dr. A.K. Roy, Secretary, Department of Fisheries, Govt. of Assam also graced the occasion as Guest of Honour. About 200 dignitaries from all the Northeastern states participated in the programme. On the occasion, Dr. P.C. Mahanta, Director, DCFR, Bhimtal expressed his gratitude to the people of the region and emphasized



Inauguration of DCFR N-E Information Centre by Hon'ble Minister of Fisheries, Govt. of Assam, Sri Basanta Dasji

that this center will definitely help the students, scientists, and academicians by providing information not only on coldwater sector but also the entire fisheries in a holistic manner.

Frontline demonstration in fish farmers tanks in Champawat District

Dr. Suresh Chandra, Sr. Scientist, DCFR Field Centre Champawat undertook frontline demonstration (FLD) of improved common carp variety namely Champa1, Champa 2 at two adopted fish farmers tanks located in village Chhamola and Khetikan in Champawat district. At village Chhamola fish tank was stocked with silver carp, improved common carp and grass carp while farmer of Khetikhan had only common carp in the tanks. Difficult uneven terrain, resource constraints, water scarcity and small land holdings are some of the common features of hill fish farming which determine the scale of aquaculture activity in a particular area. During FLD water quality management, proper fish handling, health management, netting, and feeding were demonstrated to the farmers.



Sampling & FLD at village Khetikhan

Seminars, Symposiya, Workshop, Training Organized

- Suresh Chandra, Sr. Scientist as **programme Co-coordinator**, organized Fish Farmers day on 10th July, 2012 at DCFR Field Centre, Champawat. During the programme also participated in the Exhibition, Scientist-farmer interaction meet and Seed Distribution programme arranged for the participating fish farmers.
- R.S. Patiyal, Sr. Scientist and Suresh Chandra, Sr. Scientist organized one day **Training cum Exposure Visit** for the tribal farmers of Darchhula, Pithoragarh, Uttarakhand at Dunagiri, Almora under TSP programme of the Directorate.
- Suresh Chandra, Sr. Scientist as **Course Coordinator** organized two days workshop on **post harvest utilization and value addition of trout and carp** for the woman and unemployed youth. Total 70 participants participated in the programme.
- S.K. Srivastava, Sr. Scientist and Suresh Chandra, Sr. Scientist, DCFR Field Centre Champawat organized Hindi Divas and Hindi Workshop as **programme Coordinators** during 11-14th September, 2012.
- N.N. Pandey, Sr. Scientist organized Farmers' Training in Distt. Mandi (Himachal Pradesh) on Coldwater Fish Farming during 10-12 Sept. 2012.
- N.N. Pandey, Sr. Scientist organized on farm training for trout growers of Sikkim state on breeding and culture Of Rainbow trout at Uttarey and upper Rimbi during 9-10 Dec. 2012.

Participation in Seminars, Symposiya, Workshop, Training

- S.K. Gupta, M.S. Akhtar and S.K. Srivastav attended and presented in the global symposium on "Aquatic Resources for Eradicationg Hunger and Malnutrition-Opportunities and Challenges" held during 4 – 6 December, 2012 at Mangalore, Karnataka.
- R.S. Patiyal Sr. Scientist Participate and presented a paper in the "National Seminar on Status of

environment and Biodiversity: Rio+20 and Role of Space Technology" organized by Department of Zoology and Environment Science Gurukul Kangri University, Haridwar on 2-3 November, 2012

- Ashoktaru Barat, Principal Scientist, Sr. Scientists Amit Pande, P.K. Sahoo and Suresh Chandra, R.S.Patiyal, Sr. Scientist and R.S.Halder, Tech.

Officer participated in the International Programme on Information Day at Nainital on 26th November, 2012 organized jointly by JNU, New Delhi and EU.

- N.N. Pandey, Sr. Scientist Participation in National Seminar on emerging Pollutants and Pathogens: Challenges and Risk reduction, organized by IITR, Lucknow during 20-22, Sept. 2012.

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- Debajit Sarma, R.S. Haldar, M.S. Akhtar, N.N. Pandey, P.C. Mahanta 2012. Breeding and Hatchery Management of *Tor putitora* (in Hindi). DCFR Bulletin No.20.
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- D. Sarma and P. C. Mahanta (2012). Captive breeding and growout of Golden Mahseer (*Tor putitora*). A(B)ACA Bulletin 2012. Pp. No. 1-7.
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R.S. Haldar, Dr. N.N. Pandey and Dr. P.C. Mahanta.

- 25 years of Directorate of Coldwater Fisheries Research, DCFR Bhimtal publication, Edited by Dr. S. Ali, Mr. S.K. Malik and Dr. R.S. Haldar.

Leaflets/folders published

- M. S. Akhtar, Debajit Sarma and N.N. Pandey. 2012. Nanhe mahseer: a micro diet for larval rearing of golden mahseer. DCFR Publication. (In English & Assamese)
- M. S. Akhtar, Debajit Sarma and N.N. Pandey. 2012. Potential of cage culture in coldwater lakes and reservoirs. DCFR Publication. (In English & Assamese)
- S.K. Gupta, S.K. Srivastava, Debajit Sarma and P.C. Mahanta 2012. Important coldwater ornamental
- fishes of India. DCFR Publication. (In English & Assamese)
- N.N. Pandey 2012. Culture and Breeding of Rainbow Trout (*Onchorhynchus mykiss*) in Mid Hills. DCFR Publication. (In English & Assamese)
- S.K. Srivastava, Suresh Chandra, S.K. Gupta N.N. Pandey, Debajit Sarma 2012. Improved Strain of Common Carp Champa-1 and Champa-2 for diversification of Hill aquaculture DCFR Publication. (In English & Assamese)
- Debajit Sarma, R.S. Haldar, M.S. Akhtar, N.N. Pandey, P.C. Mahanta 2012. Breeding and Hatchery Management of *Tor putitora* (in Hindi & Assamese). DCFR Bulletin No.20.
- Dr. N.N. Pandey Leaflets (Extension material) on 25 topics in English and other NE languages.

Awards and Recognitions

Dr. M. S. Akhtar has been conferred the degree of Doctor of Philosophy in Fish Nutrition and Biochemistry on 3rd September, 2012 by Central Institute of Fisheries Education (Deemed University), Mumbai on his thesis entitled 'Physio-metabolic responses of tropical and temperate fish to different stressors and their mitigation measure.

Dr. R.S. Patiyal Sr. Scientist DCFR was conferred with the Fellowship of Indian Academy of Environmental Science, Haridwar for his achievements in coldwater fishery research. The award was conferred by Prof. Swatantr Kumar, Hon'ble Vice Chancellor G.K. University, Haridwar on 2 November, 2012 during National Seminar, Haridwar.



Dr. RS Patiyal receiving Honorary Fellowship of I A E S, Haridwar 2012

Extension Activities & Other Services

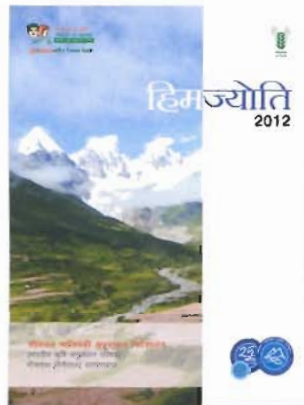
- Suresh Chandra, Sr Scientist, R.S. Patiyal, Sr. Scientist Shri Santosh Kumar, T-5 and Shri T.M. Sharma T-3 participated in the **Kisan Mela and Exhibition** at VPKAS, Hawalbag, Almora on 28th September, 2012.
 - Suresh Chandra, Sr. Scientist and Sri T.M. Sharma Tech. Asst. Participated in the International Exhibition "IAI" at IARI exhibition ground, Pusa New Delhi during 13th-15th December, 2012 and DCFR stall received honor of award from the organisers.
 - S.K. Srivastava, Senior Scientist and Suresh Chandra, Senior Scientist Participated in the Farmers fair at KVK Lohaghat on 11th December, 2012.
 - N.N. Pandey participated in Exhibition in Fish farmer's day, celebrated at Experimental Field centre, DCFR, Champawat during 9-10, July 2012.
 - N.N. Pandey participated in Exhibition and Kisan Mela, organized by VPKAS, Almora at Habal bagh on 28, Sept. 2012.
 - N.N. Pandey participated in Exhibition in Kisan Mela, organized by GBPUA & T Pantnagar during 4-7 Oct. 2012.
 - N.N. Pandey participated in International Exhibition on managing trans boundary diseases of Agricultural importance in Asia Pacific, organized by expert consultation (ICAR) at New Delhi during 10-12 Oct. 2012.
 - N.N. Pandey participated in Exhibition in National Seminar on Mountain Fisheries : Challenges and opportunity for livelihood security, organized by DCFR, Bhimtal during 9-10 Nov. 2012.
 - N.N. Pandey Exhibition in Global Symposium on Aquatic resources for Eradicating the Hunger and Malnutrition by Asian Fisheries Society, Indian branch, Mangalore during 4-6 Dec. 2012.
- ### Radio Talk
- Suresh Chandra delivered a talk on Pond preparation for fish farming in hills (Hindi) on 26th July, 2012, All India Radio, Almora, Uttarakhand



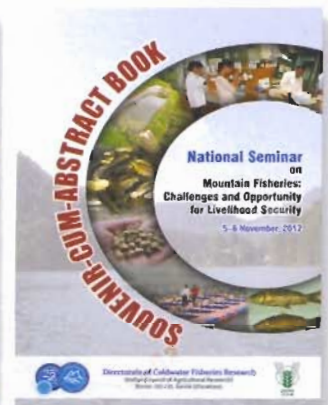
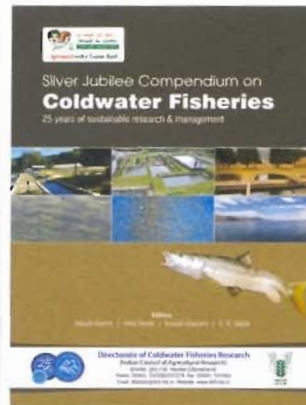
Dr. Suresh Chandra, Sr. Scientist explaining to the visitors during IAI Exhibition at IARI, Pusa, New Delhi

Books Published

- Souvenir cum Abstract book, National seminar on Mountain Fisheries: Challenges and opportunity for livelihood security, organized by DCFR, Bhimtal, edited by Dr. N.N. Pandey, Dr. R.S. Patiyal, Dr. Neetu Shahi, Dr. M.S. Akhtar.
- Silver Jubilee Compendium on Coldwater Fisheries,



- edited by Dr. D. Sarma, Dr. Amit Pande, Dr. S. Chandra, Dr. S.K. Gupta.
- Him Jyoti (Hindi), DCFR Bhimtal Publication, edited by Dr. R.S. Patiyal, Dr. N.N. Pandey, Dr. Prem Kumar and Mr. Amit Joshi.
- Bibliography



Visitors at Field Centre Champawat

- DDG (Fy.) Dr. B. Meena Kumari, visited DCFR Champawat Centre on 8th July 2012.
- Shri, Tripathi (SDM) Lohaghat, visited Champawat Centre on 18th December, 2012
- Dr. K.D. Joshi, Head & PS Riverine Division, CIFRI, Allahabad visited the Field Centre Champawat on 14th November, 2012 to observe the ongoing

research and extension activities.

- Dr. Arun S. Ninawe, Scientist 'G' Advisor (DBT), Govt. of India, visited the Field Centre Champawat on 22nd Dec. 2012
- Prof. R.S. Chauchan along with BFSc and MFSc students visited DCFR Champawat Centre on 29th October 2012



Interaction of scientist and staff from DCFR with DDG (Fy.) Dr. B. Meena Kumari, ADG Inland (Fy.) Dr. S.D. Singh and Director, DCFR, Dr. P.C. Mahanta at Champawat on 9th July 2012



Field demonstration and practical training on carp and trout farming imparted to the students by the scientists of on 29th October 2012 at Champawat.

उत्तराखण्ड से नवीन प्रजाति (सीचिसटूरा ओब्लीक्यूओफासिआ) की पहचान

उत्तराखण्ड के चॉफी (भीमताल) जिला नैनीताल के समीप कालसा धारा से वालीटोराडी परिवार की निमाचिलेनी उप परिवार वर्ग की एक नवीन प्रजाति सीचिसटूरा ओब्लीक्यूओफासिआ (चित्र 1) की पहचान की गयी। सिचिसटूरा ओब्लीक्यूओफासिआ के CYTB श्रृंखलाओं को सफलतापूर्वक विस्तारित कर उनको जीन बैंक में रखा गया। इन श्रृंखलाओं को एक सीध में अन्य सीचिसटूरा प्रजातियों जैसे. सीचिसटूरा, बिवानी तथा सीचिसटूरा कोरिका एवं शाइजाथोरेक्स रिचार्ड सोनी के साथ जातिवृत्तिय सम्बन्धों का पता लगाने के लिए पंक्तिबद्ध किया गया। शाइजाथोरेक्स रिचार्ड सोनी तथा सिचिसटूरा की तीन एन0 जे0 ड्री0 (neighbor joining

tree) में दो मित्र क्लस्टर बाह्य रूप में थे। एन0 जे0 ड्री0 और अनुवांशिकी आँकड़े बताते हैं कि सिचिसटूरा ओब्लीक्यूओफासिआ सचिसटूरा बीवानी के समीप तथा सचिसटूरा कोरिका से दूरी पर थे। नई प्रजाति का फोटो सहित वर्णन जू टैक्सा 3586: 255.263 (2012) में प्रकाशित हुआ है।

चौकलेट महाशीर का प्रजनन एवं लार्वा का विकास

चौकलेट महाशीर निओलिससोचिलस हैक्सगौनौलिपिज का प्रजनन और उसके लार्वा का विकास शी0 जे0 मा0 अनु0 निदेशालय भीमताल के हैचरी परिसर में सफलता पूर्वक किया गया। परिपक्व अण्डों एवं शुक्राणुओं को स्ट्रिपिंग विधि से एकत्रित कर उनको

निषेचित कराया गया। निषेचित अण्डों को उद्भवन हेतु जलप्रवाह पोषण शाला में रखा गया, निषेचित अण्डें पारदर्शी, गोलाकार, तलहटी में बैठने युक्त, चिपचिपे रहित तथा भूरे रंग के 2.8 मिमी0 से 3.1 मिमी0 आकार के थे। 40 घण्टे तक निषेचन के पश्चात अण्डों को 22 घण्टे तक 22±2 डिग्री से0ग्रे0 के तापक्रम में सेना आरम्भ किया गया। नवीन उद्भिद लार्वा 8.5 मिमी0 लम्बे थे। अण्डे सेने के 16 दिनों के पश्चात अण्ड पीत पूर्णरूप से अवशोषित कर लिया गया और कुल लम्बाई 14.32±0.26 मिमी0 प्राप्त की एक ही समय में पाचन तंत्र पूर्णतः विकसित हो गया तथा लार्वा भोजन को ढूँढने लग गया, ऐसा चॉकलेट महाशीर के लार्वा विकास में प्रथम बार हुआ है। इस प्रकार इस अध्ययन से प्राप्त की गयी बहुमूल्य सूचनाएँ बड़े पैमाने पर चॉकलेट महाशीर के बीज उत्पादन तकनीकी की स्थापना में मददगार सिद्ध होगी।

अरुणाचल प्रदेश की चोमको तथा डिकरोंग नदियों में सजावटी मत्स्य संसाधन

अरुणाचल प्रदेश की चोमको एवं डिकरोंग नदियों में सजावटी मत्स्य संसाधनों का पता लगाने के लिए एक सर्वेक्षण किया गया। प्रमुख प्रजातियों में सीलोरिचस, अरुनाचिलिसिस, पेटियस सोपोर पकड़ी गयी। अन्य प्रजातियों में बोटिया बोटिया, बोटिया रोस्ट्राटा (लोचेस), बाटिलियस दारना, चन्नानामा, लेबियो गोनियस, लेबियो पंगस, डानिओ रिओरिओ पकड़ी गयी।

बी0एस0 कालोनी के समीप चोमको नदी (इसका एक उपनाम गंगा नदी भी है) में विद्युत सेम्पलिंग की गयी। बोटिया डेरियो तथा रोस ट्राटा के अतिरिक्त अबोरिचिट्स कम्पी प्रजाति की भी प्रधानता थी। जल की गुणवत्ता, प्रजातियों की लम्बाई व भार आदि मापदण्डों को अंकित किया गया। इसी प्रकार का सर्वेक्षण तीस्ता नदी बाकछा छू नदी (सिक्किम) में भी किया गया। तीस्ता नदी से शाइजोथोरेक्स प्रोगस्टस (स्थानीय चू अलासा) तथा गारा प्रजातियों को एवं बाकछा छू नदी से शाइजोथोरेक्स रिचार्डसोनी (स्थानी दोन्थे असाला) को पकड़ कर उनका लेखा प्राप्त किया गया।

चम्पावत जिले में तालाबों में मत्स्य प्रदर्शन

शी0ज0मा0 अनु0 निदेशालय के वैज्ञानिक डॉ0 सुरेशचन्द्रा ने चम्पावत में मत्स्यपालकों के अधिग्रहीत किए गए दो तालाबों क्रमशः छमोला ग्राम तथा खेतीखान में सम्वर्धित दो मत्स्य प्रजातियों चम्पा-1 व चम्पा-2 का पदर्शन किया। ग्राम छमोला स्थित मत्स्य तालाब में सिल्वर कार्प, सम्वर्धित कामन कार्प तथा ग्रास कार्प को रखा गया जबकि खेतीखान स्थित तालाब में केवल कामन कार्प को संग्रहित किया गया। इस दौरान मत्स्य पालकों को जल की गुणवत्ता, प्रबन्धन, समुचित मत्स्य रख-रखाव, स्वास्थ्य प्रबन्धन, नैटिंग तथा मछलियों को भोजन देने की विधि आदि से सम्बन्धित जानकारी भी दी गयी।

चम्पावत प्रक्षेत्र में पक्षियों के द्वारा ट्राउट का भक्षण

किंगफिशर पक्षी के द्वारा मछलियों का भक्षण सामान्यतः आम बात है, किन्तु चम्पावत प्रक्षेत्र में पहली बार उल्लू पक्षी के द्वारा ट्राउट, जीरा, तरुण एवं वयस्क मछलियों को काफी नुकसान पहुंचाया जा रहा है।

सिक्किम राज्य में ट्राउट मत्स्य पालन

“सरस्टेनेबल यूटीलाइजेशन ऑफ माउन्टेन फिशरी रिसोर्सेज: ए पार्टनरशिप मोड” परियोजना के अन्तर्गत सिक्किम राज्य में ट्राउट मत्स्य पालन को बढ़ावा देने के लिए शी0 ज0 मा0 अनु0 निदेशालय भीमताल और राज्य मत्स्य विभाग सिक्किम ने आपसी सहयोग से पहल की है। इसके प्रजनक भण्डार प्रबन्धन तथा बीज उत्पादन को प्राथमिकता के आधार पर लिया गया है। पश्चिमी सिक्किम जिले के ऊपरी रिम्बी श्री बादाम तथा उत्तरे के प्राइवेट मत्स्य पालकों के तालाबों में मई (2012) के महीने में संचयित अंगुलिकाओं में आठ माह में 500-600 ग्राम की सामान्य वृद्धि देखी गयी। स्थानीय बाजार में मत्स्य पालकों को इसका मूल्य 600-1000 रु0 प्रति किलो तक प्राप्त हो रहा है। तालाबों का प्रबन्धन, मत्स्य आहार, प्रजनक भण्डारों रख रखाव, ट्राउट प्रजनन तथा स्वास्थ्य प्रबन्धन आदि पर ट्राउट मत्स्य पालकों तथा विभागीय कर्मचारियों को तालाबों में ले जा कर निदेशालय के वरिष्ठ वैज्ञानिक डॉ0 एन0एन0 पाण्डे एवं श्री आर0एस0 हलधर तकनीकी अधिकारी ने प्रशिक्षण दिया। प्रशिक्षण की अवधि में उत्तरी ट्राउट फार्म पश्चिमी सिक्किम में 4-6 व्यास वाले 1,1000 निषेचित अण्डों का उर्वरण किया गया। अण्डों के उद्भवन एवं ओवा हाउस मैनेजमेंट के लिए राज्य मत्स्य विभाग के कर्मचारियों को सभी आवश्यक कदम एवं निर्देश दिये गए। इससे पता चला कि प्रशिक्षण प्राप्ति के पश्चात राज्य मत्स्य विभाग एक ऋतु में लगभग 60000 ओवा उत्पादित करने में समर्थ है। निदेशालय ने अण्ड दोहन कार्य की सरलता के लिए एक लकड़ी का स्टैंड बनाया है ताकि अण्डदोहन के समय प्रजनकों को शारीरिक नुकसान न पहुँचे। निदेशालय के वैज्ञानिकों ने सरचोक के राज्य मत्स्य विभाग के कर्मिकों के साथ सरचोक (लाचुंग) ट्राउट फार्म एवं कुछ अन्य व्यक्तिगत ट्राउट पालकों ने स्थानीय रेस्त्राओं में अपने सम्बन्ध स्थापित किये हुए हैं जहाँ उन्हें मछली का अच्छा दाम प्राप्त होता है।

वैज्ञानिकों ने एन0एफ0डी0बी0 द्वारा पोषित नवीन रेन्बो ट्राउट हैचरी क्यौंगनोसोला तथा मेमैन्वों के समीप बाबा मंदिर के ट्राउट तालाबों के उद्घाटन समारोह में भी भाग लिया। वैज्ञानिकों ने सिक्किम राज्य के मत्स्य मंत्री तथा सचिव राज्य मात्स्यिकी विभाग से भी मुलाकात की और राज्य के ट्राउट फार्मों के बारे में विचार-विमर्श किया। माननीय मंत्री एवं सचिव ने राज्य में ट्राउट मत्स्य पालन के विकास हेतु निदेशालय के वैज्ञानिकों द्वारा किये जा रहे कार्यों की सराहना की।

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