

FROM DIRECTOR'S DESK

Uttarakhand witnessed devastating flash floods due to heavy rainfall and cloud burst during 16-17 June 2013 affecting 12 Districts. The natural disaster was described as the Country's worst disaster since the 2004 tsunami claiming thousands lives and damaging roads, bridges and other infrastructures. In this critical moment all our ICAR Institute of this region i.e. DCFR, Bhimtal, VPKAS, Almora; PDFMD, Mukteshwar; Regional Centre of CITH, Mukteshwar; Regional Centre of NBPGR, Bhowali, Joined hands for the relief work. On our appeal Central Institute of Brackish water, Chennai also contributed for the relief work. I extend my sincere gratitude to all Directors/Heads and employees who generously cooperated and contributed for the relief work.

During the reporting period total mt DNA genome sequencing of *Tor putitora*, studies on disease in fry of Chocolate mahaseer, breeding of ornamental fishes, performance evaluation of improved strain of common carp, seed production of rainbow trout are some of the important activities undertaken. Besides, Directorate with an aim to improve the economic condition and to provide nutritional security initiated new activities under Tribal Sub Plan (TSP). Under this program in Uttarakhand 30 tribal farmers have been adequately addressed by extending technical and infrastructural support. Further, tribal farmers have been identified in Himachal Pradesh, J&K (Leh-Ladhak region), Assam and Darjeeling area of west Bengal. Directorate has extended various activities in North-Eastern Hill (NEH) region. I am glad to mention here that for the first time 58,000 eyed ova of rainbow trout produced at DCFR field centre were supplied successfully to the Department of Fisheries, Govt. of Arunachal Pradesh. Various training programmes, extension activities, documentations of 'Vision 2050' and 12th Five Year Plan EFC were carried out during the period. It was the constant efforts of all scientists and staffs of this Directorate that made possible for such progress and achievements. I acknowledge everybody's contribution.



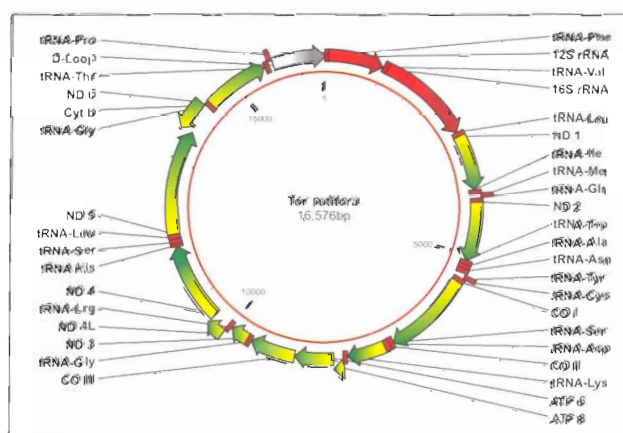
A. Barat

(A. Barat)
Director (Acting)

Research highlights

Whole mitochondrial genome of *Tor putitora*:

A complete mitochondrial genome of *T. putitora* was successfully amplified and sequenced. The complete mitochondrial DNA sequence of *Tor putitora* is 16,576 bp (Accession No. KC914620). It consists of 13 protein coding genes, 22 tRNAs, 2 rRNA genes, and one putative control region. Most of these genes are encoded on the H-strand, except for the ND6 gene and eight tRNA genes (tRNA^{Gln}, tRNA^{Ala}, tRNA^{Asn}, tRNA^{Cys}, tRNA^{Tyr}, tRNA^{Ser}, tRNA^{Glu}, tRNA^{Pro}), which encoded on the L-strand.



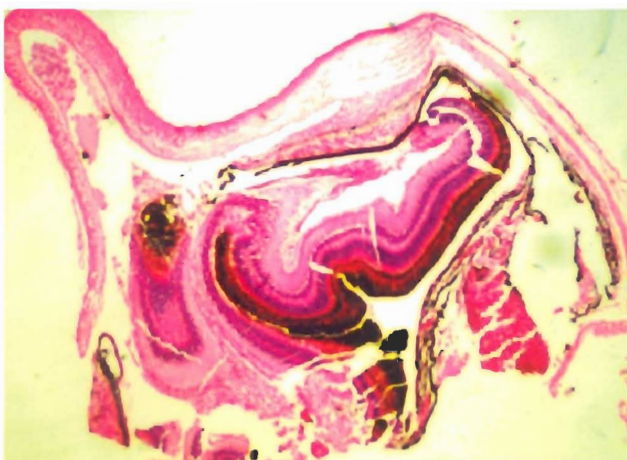
Mitochondrial genome organization of *Tor putitora*

Report of corneal hypertrophy in fingerlings of chocolate mahseer, *Neolissochilus hexagonolepis* (McClelland, 1839)

Corneal hypertrophy was observed during June, 2013, in fingerlings (weight $3.26 \pm 1.9g$; length $6.46 \pm 3.9cm$) of chocolate mahseer, *Neolissochilus hexagonolepis* (McClelland, 1839) in rearing pond of mahseer hatchery unit, Bhimtal. The advanced stage of disease was marked with damage of cornea and shrunken eye. Skeletal deformity was also recorded in some of the infected fishes. Samples of eye



Craniocaudal view of head of chocolate mahseer fingerlings showing corneal hypertrophy



Eye, transverse section, entirely damaged cornea, disruption of vitreous, aphakic globe, oedema of choroid and optic nerve and deformed retina



A haul of fish from Barnigad (Yamuna)



Brown trout caught from Rupin

and other organ were collected for histopathology, parasite and microbial investigation. Histology of eye indicated ocular collapse, entirely damaged cornea, disruption of vitreous, aphakic globe, oedema of choroid and optic nerve and, deformed retina. Microscopic observations of wet mounts and histopathology ruled out infectious agents like microsporidia, myxosporidea, cystercoidiasis, digeneans, atypical mycobacteria, bacteria of *streptococcus* group and fungi.

A report on Institutional Consultancy Program

Study area: The field studies were conducted during March-April and May-June 2013 at 28 locations in Yamuna starting from Janaki Chatti to Ponta Sahib and in Tons from Naitwar-Mori till confluence of Yamuna and Tons for collecting the primary data on physico-chemical parameters of water and aquatic flora & fauna in the study area.

Breeding of ornamental fishes under DBT project

Keeping in view the available land size, water availability and the slow fish growth due to low temperature it was conceptualized that the ornamental fish preference for culture and commercialization. To experiment on it brood stock of koi carp and gold fish were raised in institute's pond and bred successfully. Around 3000 fingerlings of gold fish and koi carp are now ready to stock in farmers' pond.

Gold fish

Successful breeding of the Gold fish (*Carassius auratus*) in the month of March and 2013 was carried out at DCFR Bhimtal campus. Brood stock was purchased from market and acclimatized in poly lined ponds for 1 year. Mature healthy Gold fish brooders were segregated from pond (Temp 21-26°C) and kept in FRP tanks (Temp 15-19°C). Natural breeding was done in FRP tanks by creating conducive environment. All female released viable egg after 42 hrs and hatching took place in 120 hrs. A hatching success was achieved 50%.



Fry and fingerlings of Koi carp and Gold fish raised in DCFR

Koi carp

The induced spawning of Koi carp (*Cyprinus carpio*) was carried out in the DCFR campus Bhimtal on August 2013. The breeding was done in FRP tanks (Temp. 18-23°C). Mature healthy koi carp brooders (200-250 g) reared in cemented pond (Temp. 19-25°C) were selected for breeding. The spawning was induced by intra-peritoneal injections of ovaprim at a dose of 0.3 ml/kg body weight. The egg release was witnessed within 15 hrs and hatching was observed in 84 Hrs. A hatching success was achieved of about 80%.

Performance evaluation of improved strain of common carp

Breeding of improved strain of Hungarian common carp (*Ropsha scaly*) and *Felsosomogy mirror carp* was done at DCFR Experimental Field center, Champawat during April 22, 2013 to May 2013 and approximately one lakh fry were produced.



Breeding of Common carp at Champawat farm

In- situ rearing of golden mahseer seeds in floating cages at Bhimtal Lake

The experimental trial for *in situ* seed rearing of golden mahseer in floating cages at Bhimtal Lake has been initiated to optimize the stocking with higher densities to explore the maximum carrying potential. The fry of average weight



Stocking of fry into floating cage

0.191g were stocked in four stocking densities viz. 100, 150, 200 and 250 nos/m³. They were being fed with formulated diets with 35% protein *ad libitum* once daily. The growth, survival and water quality parameters had been monitored periodically.



Harvesting of the fingerlings

The growth, survival and water quality parameters of golden mahseer fry stocked in floating cages for *in situ* seed rearing were analyzed. At the end of the rearing period, significant difference was observed in weight and survival of mahseer fingerlings. The weight was 9.12, 8.95, 8.27 and 7.87 g in the stocking densities of 100, 150, 200 and 250 Nos/m³ groups respectively. The % survival was 89.4, 85.5, 79.5 and 71.6 in the respective stocking density groups. Results revealed that the optimum stocking density for *in situ* seed rearing of golden mahseer in floating cages may be recommended as 150 Nos/m³.

Breeding and seed production of rainbow trout

A total of 1.2 lakh eyed ova of rainbow trout were produced during January-March, 2013 at the Champawat field centre. About 15,000 advance fry of grass carp distributed to 50 farmers of Uttarakhand. Fingerlings of common carp reared at this centre were supplied to north eastern states and to Fisheries Dept., Govt of Himachal Pradesh.



Seed and eyed ova of rainbow trout

Five important coldwater candidate fish species (rainbow trout, snow trout, common carp, silver carp and grass carp) of different age group (1-6 years) including two Hungarian strains of common carp (scale carp and mirror carp) have been maintained at the farm for different research activities and breeding programme. Two year old stocks of rainbow trout (about 2000) have been maintained for the brood stock and seed production. Healthy fry of rainbow trout (about 15000) have been maintained at Experimental fish farm, Chhirapani, Champawat.

ICAR Institutes helping hands towards Uttarakhand Disaster

Due to heavy rainfall during 16 to 19 June 2013, entire Uttarakhand faced heavy disaster and caused the losses of thousands of human lives as well as animals. In response to this disaster mitigation two relief program were carried out immediately. The relief and rescue programme was coordinated by DCFR with the support of all ICAR institutes located in the Kumaon region of Uttarakhand and CIBA, Chennai. By virtue of the generous contributions from the employees of DCFR and other ICAR institutes of the region, a sum of rupees 2.3 lakhs had been raised for this noble cause. The financial contribution given by different institutes are as below:

Sl.	Name of the Institute	Amount
1.	Directorate of Coldwater Fisheries Research, Bhimtal, Uttarakhand	Rs. 1,12,151=00
2.	Vivekanand Parvatiya Krishi Anusandhan Sansthan, Almora, Uttarakhand	Rs. 25000=00

Sl.	Name of the Institute	Amount
3.	Project Directorate on Foot and Mouth Diseases, Mukteshwar, Uttarakhand	Rs. 25000=00
4.	Regional Centre of Central Institute of Temperate Horticulture Mukteshwar, Uttarakhand	Rs. 11000=00,
5.	Regional Centre of National Bureau of Plant Genetic Resources, Bhowali, Uttarakhand	Rs. 15800=00
6.	Central Institute of Brackishwater Aquaculture, Chennai.	Rs. 47,200=00.
Total amount		Rs. 2.36151=00

Relief Camp at Naya Basti

In consequence of joining hands of ICAR to recently torrential rain disaster affected areas of Uttarakhand, on 29.6.2013 a relief team comprising of scientists and other staff of Directorate of Coldwater Fisheries Research, Bhimtal had proceeded to Dharchula region of District Pithoragarh to distribute the relief items in the form of food ration and necessary medicines to the affected families. Scaling all the hurdles a team comprises of Dr. R.S. Patiyal, Dr. Prem Kumar, Shri B.C. Pandey, Shri Amit Joshi, Shri Tejpal and other staff reached at Baluwakot via Pithoragarh and arranged a relief distribution camp in Baluwakot, Nayabasti, Gothi, and Charchum. The relief items were distributed among two hundred affected families of the region in presence of "Rung kalyan Sanstha officials" Shri Mahiman Singh Hyanki and Shri Diwan Singh Patiyal.



A view of Uttarakhand disaster that caused the heavy losses of human, aquatic animal and biodiversity too



DCFR scientist carrying relief items



DCFR scientist rescuing a stranded family in midnight



ICAR Relief & Rescue team

Relief Camp at Dharchula

DCFR, Bhimtal has taken lead in 2nd phase distribution of relief materials to the affected people during 24.8.2013 and 25.8.2013 at Dharchula. During the last visit, it was observed that shelter was the priority requirement of the people, who lost their house during the flood. Therefore, a second consignment of 150 blankets and 50 number of Tarpaulin were distributed among the affected people. The distribution was made through "Rung Kalyan Sanstha" in presence of Shri N.S. Napalchiyal (IAS), Chief Information Commissioner & Ex-Chief secretary (Govt. of Uttarakhand); District Magistrate, Pithoragarh and other dignitaries from Uttarakhand Government.



Shri N.S. Napalchiyal (IAS), Chief Information Commissioner & Ex-Chief secretary (Govt. of Uttarakhand) distributing relief material



Blanket distribution at Naya Basti, Dharchula

EVENTS

Research Advisory Committee (RAC) meeting

The meeting of RAC was held on 9-10 April 2013 at Directorate of Coldwater Fisheries Research, Bhimtal. The meeting was attended by Dr. K. K. Vass (Chairman), Dr. Krishna Gopal (Member) Dr A. Barat (Acting Director & Member-Secretary). The meeting was also attended by all the scientists of this directorate, who presented their work progress.



A view of Research Advisory Committee Meeting

Environment Day Celebration

World environment day was celebrated on 5th June 2013 at DCFR, Bhimtal. Dr. R S. Chauhan from Pantnagar University of Agriculture and Sciences was the chief guest on this occasion.



Dr. R S. Chauhan Chief Guest planting a tree

Institute Management Committee (IMC) Meeting

The meeting of Institute Management Committee meeting was conveyed on 8th August, 2013 at DCFR Bhimtal under the chairmanship of Dr. A. Barat, Director (Act.) and the members of IMC. The meeting was attended by 'Dr. S.D. Singh ADG (I.F.Y.), Dr. P.K. Agrawal (VPKAS, Almora), Dr. P. Punia (NBFG, Lucknow)' Dr. A.B. Pandey (Regional Research Centre, IVRI, Mukteshwar) and Dr. Malovika Das (GBPUA&T, Pantnagar). The committee appraised the action taken on the previous IMC and approved to procure the equipments depicted in XII plan EFC which are of urgent in nature.



A view of Institute Management Committee Meeting

Independence Day Celebrated

Flag hoisting ceremony was observed on the Independence Day. Dr. A. Barat, Director hoisted the national flag. He congratulated the staff for successful management and appreciated the scientific staff for their achievement in different field.



Dr. A. Brat, Director hoisting the National Flag

Quinquennial Review Team for reviewing progress during 2008-2013

The first QRT meeting was held during 11.9.2013 to 13.9.2013 which was attended by Dr. M.M. Sinha (Chairman) Dr. M.M. Goswami, Dr. M.H. Balkhi, Dr. Prem Kumar (Member Secretary) and all scientists of DCFR, Bhimtal. Dr. P.C. Mahanta, Ex Director, DCFR, Bhimtal was also invited to attend the meeting as a special guest. Member Secretary, QRT presented Action Taken Report (ATR) and achievements during the reviewing period. The team paid a field visit to Champawat Centre during 12-13.9.2013 to assess the progress on scientific achievements and farm activities.



A view of QRT meeting

Hindi Week and National Hindi Workshop on "Parvatiya Chetron Mae Jaljeev Palan Vividhikaran".

The Institute celebrated Hindi week on 14 to 20 September 2013 during which several Hindi competitions like Essay writing, translation, noting-drafting, word power and typing etc. were organized among the staff of the Institute to promote the use of Hindi in official work. The winners were given prizes by Dr. B.S. Bisht, Ex-Vice Chancellor Pantnagar, during inaugural function of Hindi workshop.

Two days Hindi workshop was organized at DCFR, Bhimtal from 23-24 September 2013. The main theme of this workshop was "Parvatiya Chetron Mae Jaljeev Palan Vividhikaran". The chief guest on this occasion was Dr. B.S. Bisht, Director, BIT, Bhimtal and Ex-Vice Chancellor Pantnagar. Major objectives of the workshop were (i) Coldwater fish resource management, (ii) Diversification of cold water fisheries and (iii) Livelihood security through aquaculture and participation of woman.



Dr B.S. Bisht, Inaugurating the Hindi workshop by lighting the lamp



Release of abstract book

Fish Farmers Day at Tribal village Tharu Teeshora

Directorate of Coldwater Fisheries Research (DCFR), Bhimtal celebrated Fish farmer's Day at tribal village Tharu Teeshora, in Udham Singh Nagar, Uttarakhand on 10th July 2013. The programme was presided over by Dr. Ashoktaru Barat, Director, DCFR, Bhimtal, Uttarakhand. Dr. R.S. Patiyal, Sr. Scientist and programme coordinator of the programme welcomed all the farmers, entrepreneurs, dignitaries and media persons.

In the inaugural address, Dr. Barat welcomed all the farmers and highlighted the importance of rural aquaculture for income generation and for livelihood security particularly for the poor farmers with small land holdings. The scientists of DCFR, Bhimtal and Champawat center participated in the interactive session to address the queries raised by the farmers. Director along with the other scientist and farmers released fish seed of various fish species in farmers pond constructed under TSP programme. Plankton nets, hand net, cast net and thermometer were distributed to adopted fish farmers of Udham Singh Nagar.



Distribution of nets



Seed stocking



Feeding demonstration

Extension/training Activities

Frontline Demonstration

DCFR Field Centre Champawat undertook demonstration of improved common carp variety at two adopted fish farmers tanks located in village Chhamola and Khetikan in Champawat district on 7 May 2013. At village Chhamola fish tank was stocked with silver carp, improved common carp and grass carp while farmer of Khetikan had only common carp in the tanks. Detailed methods of proper fish handling, health management of stocked fishes, netting, and feeding with appropriate input applications in fish tanks were disseminated to the fish farmers during the visit.



Field day at village Chhamola



Rainbow trout seeds distribution

Training Programme

For SC/ST Farmers

With an aim to economic empowerment of SC and ST farmers through fish farming technology with special reference to polytanks aquaculture in upland remote areas, two day training was organized at village Pangu, Dharchula, Uttarakhand

On 28- 29th September, 2013. Directorate of Coldwater Fisheries Research, Bhimtal under project "Economic development of SC and ST community of mid hill region of Pithoragarh district through aquaculture intervention" organized the programme.

Total 45 SC/ST participants from villages Pangu, Himkhola, Baikun, Gothi, Chalmachilanso, Uttarakhand were imparted training on know- how on polytank fish culture. Dr. R. S .Patiyal, Senior Scientist (PI) and coordinator of the programme briefed about the aim and objective of the project and training programme. In the inaugural address, Chief Guest Shri Arvind Singh Hyanki IAS appreciated DCFR's target specific efforts for the farmers of remote and disadvantageous border areas and emphasized a importance of rural aquaculture for income generation and for livelihood security. During the programme Chief Guest distributed seed, feed and fishing gears etc to the farmers.



Distribution of seed to farmers by Chief guest Shri Arvind Singh Hyanki (IAS)



Field demonstration at village Pangu

Training at Arunachal Pradesh

One day training cum workshop was organized at Arunachal Pradesh on 19th June 2013 by Principal Scientist Dr. Debajit sarma and Mr. Sumanta Kumar Mallik. This training was attended by twenty fish farmers from private sector of Nuranang trout farm and Shergaon trout farm.

Training at Assam

A training programme was organized during 1-6th Feb, 2013 at NE information center, CIFRI, building Guwahati. 60 participants from different states of NE region took part during the training. The training program was mainly focused on the theme of Eco-tourism for livelihood upliftment in NE region.



Participants of the training at Guwahati

समाचार सारांश

अनुसंधान उपलब्धियाँ

टौर प्युटिटीरा मछली के माइटोकोन्ड्रियल जीनोम को सम्पूर्ण रूप से पहचान कर उनका एनोटेशन किया गया। टौर प्युटिटीरा का सम्पूर्ण माइकोन्ड्रियल डीएनए एनोटेशन 15,576 बेसपेयर था (Accession No. KC 914620) इसमें 13 प्रोटीन कोडिंग जीन्स 2 tRNAs, 2 rRN। जीन्स तथा 1 अनुमानित नियंत्रित रीजन था। जून माह में भीमताल स्थित महाशीर हैचरी में वॉकलेट महाशीर की अंगुलिकाओं के कोरनियल हाइपोट्राफी को देखा गया। इन मछलियों में आँखों की बीमारी पायी गयी तथा इनके शरीर में विकृतियाँ देखी गयी। इन मछलियों के हिस्टोपैथोलोजी, परजीवी एवं सूक्ष्म अन्वेषण के लिए इनकी आँखों एवं अन्य नमूनों को एकत्र किया गया। डी.बी.टी. परियोजना के अर्न्तगत उपलब्ध भूमि के प्रकार, जल की उपलब्धता एवं निम्न तापक्रम के कारण कम वृद्धि आदि को ध्यान में रखते हुए सजावटी मछलियों के पालन एवं प्रजनन पर भी ध्यान दिया गया। संस्थान के तालाबों में कोई कार्प तथा गोल्ड फिश को पाला-पोषा गया तथा उनका सफल प्रजनन कर 3000 अंगुलिकायें प्राप्त की। अप्रैल से मई माह तक प्रायोगिक मत्स्य प्रक्षेत्र चम्पावत में हंगेरियन कॉमन कार्प (रोप्सा स्कैली) तथा मिरर काप (फैल्सोगोमी) का प्रजनन कर लगभग एक लाख ज़ीस

उत्पादन किया गया। जनवरी-मार्च माह में रेन्डोड्राइट के 1.2 लाख आइड ओंका उत्पादित किए गए तथा वयरक ज़ीरा को उत्तराखण्ड के मत्स्य पालकों को वितरित किये। कॉमन-कार्प की अंगुलिकाओं को उत्तर-पूर्वी राज्यों तथा हिमाचल प्रदेश के मात्स्यिकी बिभागों को भी आपूर्ति किए गए।

जून माह में उत्तराखण्ड में आपदा से हजारों लोग मारे गए तथा पशुधन एवं मत्स्य सम्पदा की भी भारी हानि हुई। इस सम्बन्ध में आपदा पीड़ितों को शीघ्र ही मदद देने के लिए दो सहायता कार्यक्रम आयोजित किए। जिसमें भा.कृ.अनु. परिषद के उत्तराखण्ड स्थित संस्थानों ने शी.मा.अनु. निदेशालय, भीमताल के साथ मिलकर 2.3 लाख रुपये एकत्रित कर आपदा पीड़ितों को पिथौरागढ़ जिले के सुदूरवर्ती धारचुला, बलुवाकोट, नयाबस्ती, गोठी क्षेत्रों में मदद दी जिसमें दवाईयाँ, गर्म कपड़े, भोजन सामग्री आदि वितरित किये गये। विस्तारण एवं प्रशिक्षण कार्यक्रम के अर्न्तगत खटीमा, खेतीखान, छमोला, अरुणाचल प्रदेश, में प्रशिक्षण कार्यक्रम आयोजित किये गये साथ ही जनजाति उपयोगिता के तहत ग्राम पांगू, थारुतिसोर में समुदाय विशेष के लिये मत्स्य पालन सम्बन्धी प्रशिक्षण दिये गये तथा मत्स्य बीज, मत्स्य आहार एवं उपकरण आदि वितरित किये गये।

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