भाकृ अनुप
ICAR

भा.कृ.अनु.प.-केन्द्रीय मीठाजल जीवपालन अनुसंधान संस्थान
(आई एस ओ 9001 : 2015 प्रमाणित संस्थान)

ICAR-CENTRAL INSTITUTE OF FRESHWATER AQUACULTURE
(An ISO 9001 : 2015 Certified Institute)

सीफा समाचार
CIFA NEWS

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CONTENTS

DIRECTOR'S DESK

Warm greetings to all readers!

In this quarter, the ICAR-CIFA had made a fairly good progress in research and developmental activities. The main research highlights during the period comprised of: Successful production of a new generation of CIFA-GI Scampi™, study on effect of stocking density on growth and survival of *Mystus cavasius* fry, PIT tagging of 2020 year class improved rohu (Jayanti) and improved Catla at ICAR-CIFA, mass production of live food

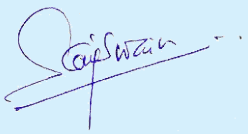
organisms and larval rearing of Hilsa (*Tenualosa ilisha*), successful breeding of *Ompok bimaculatus* without sacrificing males, mass production of Chlorella (green water) for fish larval rearing, nutrient digestibility and digestive enzyme activity in the fringed lipped carp *Labeo fimbriatus* (Bloch, 1795) fed cotton seed meal incorporated diets, breeding of *Channa marulius* through hormonal manipulation, development of plankton with application of liquid-fermented ric bran (LFRB) and evaluation of three plant extracts (methanolic bark extracts of *Terminalia arjuna* and *Azadiracta indica* and aqueous leaf extract of *Tridax procumbens*) for antibacterial properties against AMR bacteria.

The important events organized during this period include visit of Shri Tage Taki, Hon'ble Minister for Agriculture, Horticulture, Animal Husbandry, Veterinary, Dairy Development and Fisheries, Government of Arunachal Pradesh to the Institute, celebration of 34th Annual Day of ICAR-CIFA, observation of Anti Terrorism Day, organization of National Virtual Consultation on "Indian Ornamental Fisheries 2.0 - The Way Forward", World No Tabaco Day, World Environment Day, 35th Annual IRC meeting, Farmers' awareness programme on "Balanced use of fertilizers in freshwater aquaculture", 7th International Day of Yoga and Quarterly Hindi workshop. The two international events where Institute participated were: USAID project closure workshop on "Scaling Nutrition-sensitive and Innovative Fisheries Technologies through Partnerships in Odisha, India" organized by World Fish and the NACA Webinar on culture-based fisheries for rural development organized by NACA, Bangkok.

Under the extension activities, an online training on "Seed production and hatchery management of air-breathing fishes (Magur, Singhi, Tengra)" was organized and 67 trainee attended this programme. The 104 soil, water and fish disease samples of the farmers were analysed and 74 technical queries were addressed during this period. ICAR-CIFA, Bhubaneswar in collaboration with World Wide Fund for Nature (WWF) and Bali Nature Life Society (a local NGO) initiated a novel participatory livelihoods development programme through farmers' collective at Kumirmari, Gosaba, South 24 Pargana, Sundarbans, West Bengal with the funding support from Discovery Inc.

Under NEH activities, a meeting was initiated at Kalyani regarding the venture of fish culture at Silchar with Industry-Farmer collaboration by adopting ICAR-CIFA technologies to increase fish production in Barak Valley, Silchar, Assam. The SCSP activities of the Institute during the period include distribution of carp grow out (floating) feed as aquaculture input support to 27 SCSP farmers of Kendrapara district, Odisha; Farmers' Meeting at Aquaculture Farmer Field School (AFFS), Sonarpur, West Bengal; Farmers' Meeting at Ornamental Aquaculture Field School (OAFS) at Jalpaiguri, West Bengal; Scientists and Farmers' Interaction Meetings (virtual) between Scientists of the RRC of ICAR-CIFA and the farmers of Malkani hat, Sadar Block of Jalpaiguri district and Dinhata I and II block of Cooch Behar district, West Bengal.

I am happy that in spite of COVID-19 pandemic, the progress made by Institute both in research and developmental activities is fairly good. I am sure we will continue to strive hard to perform still better in the future also following the current pandemic protocols and guidelines.



(Saroj K. Swain)

DIRECTOR

RESEARCH HIGHLIGHTS

Successful production of a new generation of CIFA-GI Scampi™

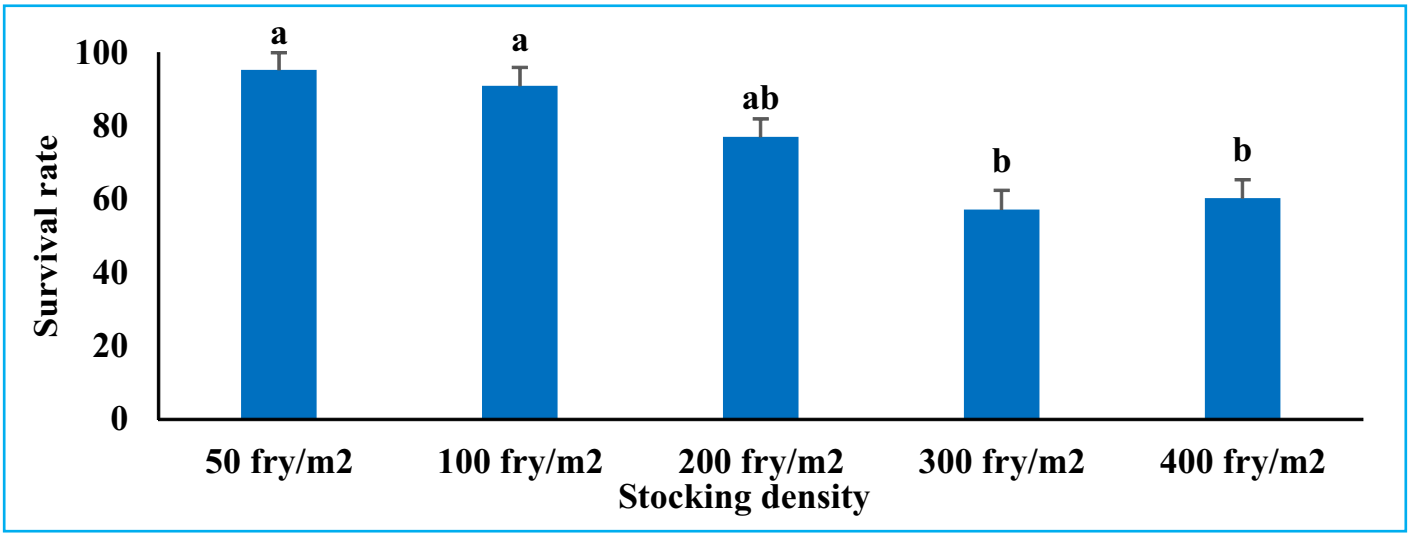
Mate allocation and breeding for the production of a new generation of CIFA-GI Scampi™ was taken up in the first week of April 2021. A total of 51 mate allocations were carried out during the period under report. A total of 47 families of the 2021 year class of CIFA-GI Scampi™ was produced. Larval rearing was completed for 39 larval batches and continuing in 08 larval batches. The total post larval (PL) output was 1.14 lakh during this period. About 20,000 seed of new generation of CIFA-GI Scampi™ was supplied to NFFBB of NFDB, Kausalyaganga for broodstock raising. Again, 9700 nos. of advanced PL from 19

families of new generation CIFA-GI Scampi™ was also provided to the multiplier unit from Andhra Pradesh for broodstock raising. Postlarvae (400 nos.) from 31 families were transferred to nylon hapas (two each for one family) for nursery rearing.

Effect of stocking density on growth and survival of *Mystus cavasius* fry

An experiment for a period of two months was conducted at the variable stocking density of *M. cavasius* (50, 100, 200, 300, 400 nos per m^2) to evaluate the growth performance of fry. The *M. cavasius* fry initial average length and weight were measured 1.66 cm and 32.58 mg, respectively. The fry was fed at 5% of body weight with crumbled feed containing 32% crude protein and 7% crude lipid twice a day. The study findings revealed that fry reared under 50 and 100 nos per m^2 showed the highest body weight 0.98-1.36 g and survival was found to be more than 90%, whereas fry reared in higher densities 200, 300 and 400 per m^2 had lower survival rate 57-77%. The result indicates that 50-100 nos per m^2 would be an ideal stocking density to produce higher fingerlings and a further increase in densities leads to reduced growth and poor survival in *Mystus cavasius* fry.

Fig 1: Effect of stocking density on survival of *Mystus cavasius* fry



PIT tagging of 2020 year class improved rohu (Jayanti) and improved Catla at ICAR-CIFA

Total 2163 individuals from 42 full-sib and half-sib families along with the control and resistant line of the 2020 year class improved rohu have been tagged. Per family, approximately 50 fingerlings are tagged and stocked in five communal ponds for further rearing and growth evaluation. Similarly, 338 fingerlings of 2020 year class improved catla from 21 full-sib and half-sib families are tagged and stocked in five communal ponds for further rearing and growth evaluation.

Table 1. Overall tagging mortality 24 h post PIT tagging (2019 year class)

Particulars	Jayanti Rohu	Improved Catla
Individual Tagged	1518	1039
Individual died	45	155
Mortality %	3.0	15

The post tagging mortality in 2019 year class improved catla is more (15%) compared to improved rohu (3%). The result shows that improved catla is more sensitive to tagging compared to Jayanti rohu (Table 1). We found no significant difference ($p>0.05$) in the tagging mortality % of small size (<30 g) Jayanti rohu and large size (>30 g) Jayanti rohu but there was a significant difference in the tagging mortality in small size improved catla (<30 g) and large size (>30 g) (Table 2).

PIT Tagging of the 2020 year class Improved rohu (Jayanti) and Improved catla

Table 2. Effect of weight on tagging mortality in improved rohu (Jayanti) and improved catla (2019 YC)

	Individual Tagged	Individual died	Mortality %
Jayanti Rohu small fish <30g	375	11	2.93
Jayanti Rohu large fish >30g	1143	34	2.97
Improved Catla small fish <30g	466	79	17.0
Improved Catla large fish >30g	570	57	10.0

Larval rearing of Hilsa (*Tenualosa ilisha*) and mass production of live food organisms

Larvae of Hilsa (*Tenualosa ilisha*) produced through artificial breeding during February, 2021 and incubation in the hatchery at RRC, ICAR-CIFA, Rahara were reared in nine circular FRP tanks (800 L water volume). Larvae were fed with *Chlorella*, rotifers, mixed zooplankton and supplementary feed for fry production. During 44 days of the rearing period, fry survival was 41, 53 and 40%, respectively at three stocking densities such as 250, 400 and 600 nos./m^3. All those fry of FRP tanks were further stocked in cement tanks for fingerlings production.

Mass culture of *Chlorella* and *Brachionus* were done in outdoor 10 FRP tanks (each with 800 L volume) in 5 times. During three months period, a total amount of 40,000 L green water having *Chlorella* ($9.8 \times 10^6 - 10 \times 10^6$ cells/ml) was produced. *Brachionus* was produced in the cement breeding pool (27,000 L water volume) three times where a total amount of 10,000 L green water was applied as food for *Brachionus*. A total amount of 80,000 L water having *Brachionus* ($12 \times 10^3 - 15 \times 10^3$ nos/L) was produced in the cemented breeding pool. Both the *Chlorella* and *Brachionus* were supplied in different times as natural food to the larval rearing tanks and hilsa culture pond at the centre.

Successful breeding of *Ompok bimaculatus* without sacrificing males:

Pond raised *Ompok bimaculatus* brooders (n=8) at 1:1 ratio was released in different flow-through systems to study breeding performance without sacrificing the males. Females (weight: 124.5 ± 7.8 g) were injected with Ovatide at 0.15 mL/100 g body weight and males (weight: 66.5 ± 3.3 g) at 0.075 mL/100 g body weight. In the first set, fishes were released directly in the tank and provided continuous aeration, whereas, in the second set, fishes were released in a cotton hapa fixed inside an FRP tank with the provision of a shower. The physico-chemical parameters of the experimental tanks were temperature: 24 ± 2^{0}C, pH: 7.6, DO: 4 ppm, total hardness: 96 ppm and alkalinity: 116 ppm. In the second set of breeding trials, three females responded to the hormone, 12-13 h post and about 6,500 larvae were produced. The fertilization rate was recorded as 56%.

Mass production of *Chlorella* (Green water) for larval rearing

The term 'Green water' refers to green-water culture worldwide. The production of green water requires certain techniques by which the desirable microalgae are produced to rear larvae of fish and crustaceans. Usually, phytoplankton is grown under a controlled system of certain management strategies, but in green water, single-cell microalgae is produced because of their unique features such as single cell dispersion, buoyant efficiency in the water column and no fouling effect in the cultured water. *Chlorella* is the best one among few microalgae used in the production of a huge amount of green water. Its application is capable of producing a substantial amount of microalgae continuously. Such cultured water remains productive, photosynthetic and maintains desired oxygen level. The advantages of use of microalgae in the larval rearing are: (i) providing direct nutrient source to the larvae (ii) maintiaining other live foods nutritional balance (iii) facilitating the larvae to feed on increasing turbidity (iv) ameliorating of water quality due to stripping of excess nitrogenous substances and increasing oxygen level, and (v) addition of digestive stimulants. More and above, the overall larval rearing system gets benefited from green water either as a direct food source or an indirect food source as in the production of rotifers, artemia, copepods and naupli of several other zooplanktons used as food for the larvae of a variety of carnivorous fish species.

Chlorella may be cultured in different containers, though transparent plastic containers are suitable among others. The containers which used for green water culture should be cleaned with bleaching powder. Cleaned containers are to be put under bright sunlight for 12 h so that action of bleaching powder disappears. The containers are then filled with bore well water to avoid contamination from other algal species. In culture water, inorganic fertilizers such as ammonium sulphate [$(NH_4)_2SO_4$, urea [CH_4N_2O], and single super phosphate [Ca $(H_2PO_4)2$] are added with the ratio of 10: 01:01, respectively. So, the ammonium sulphate, urea, and single super phosphate are applied in each tank @ 0.1 g/L, 0.01 g/L and 0.01 g/L, respectively. All these fertilizers are available commercially in fertilizer shops. In spite of several techniques available for the production of green water on a mass scale; RRC, ICAR-CIFA, Rahara has developed a simple technique that enables farmers to produce a large amount of *Chlorella vulgaris* as a green water in the outdoor system, which is beneficial and easy to achieve.

Nutrient digestibility and digestive enzyme activity in the fringed lipped carp *Labeo fimbriatus* (Bloch, 1795) fed cotton seed meal incorporated diets

Advanced fingerlings of *Labeo fimbriatus* were reared in aerated indoor tanks to elucidate the dry matter and nutrient digestibility of cotton seed meal (CSM) in the feed. The fish were fed isocaloric formulated diets containing CSM replacing the main ingredients – groundnut cake and rice bran of the Control diet at 10, 20, 30 and 40% levels. Total dry matter digestibility and major nutrient digestibility were estimated using acid insoluble ash as the marker. In general, the digestibility of dry matter, protein, fat and nitrogen-free extract were higher in CSM incorporated diets compared to the Control diet (Table 3). While the values for dry matter and nitrogen-free extract digestibility were the highest at 40% GSM incorporation level, those for protein and fat digestibility were the highest in 30% and 10% levels respectively, showing an apparent reduction thereafter. The incorporation of CSM had a stimulatory effect on the majority of the intestinal digestive enzymes tested. Fish fed the 20% CSM diet recorded the highest activity of total protease and carboxypeptidases while those fed a 30% CSM diet had the highest trypsin and amylase activities; all showing a reducing trend thereafter. In the case of hepatopancreas, the reducing trend in the activities of protease, chymotrypsin, carboxypeptidase - A and lipase observed with increased incorporation levels of CSM was significant ($P<0.05$) and the reduction in the activities of trypsin, amylase and cellulase in CSM fed fish was not significant ($P>0.05$). The study indicates the possibility of incorporation of CSM in the diet of *L. fimbriatus* up to 40% level without affecting nutrient digestibility.

Table 3. Apparent digestibility coefficient (%, Mean±SD, n = 3) of dry matter and major nutrients of the experimental diets.

Diets	Dry matter	Protein	Fat	NFE
Control	71.21±1.60^{a}	83.01±2.03^{a}	91.60 ±0.26^{ab}	88.15±0.80^{a}
CSM 10%	74.12±1.95^{ab}	85.37±1.49^{ab}	93.15±0.45^{c}	90.23±0.64^{b}
CSM 20%	75.17±1.04^{bc}	86.03±0.78^{b}	92.79±0.79^{c}	90.53±0.27^{bc}
CSM 30%	76.22±0.45^{bc}	86.69±0.28^{b}	92.42±1.40^{bc}	90.84±0.15^{bc}
CSM 40%	78.07±2.54^{c}	86.15±1.73^{b}	89.68±0.80^{a}	91.55±0.93^{c}

Breeding of *Channa marulius*

Channa marulius was successfully bred through hormonal manipulation. Twelve *Channa marulius* broodfish were randomly distributed into three cemented tanks (6 x 4 x 1 m), four in each tank. To synchronize the maturation and spawning, these fishes were administered a low dose of different steroid hormones at monthly intervals. The first group (T1) were injected with Ovatide @0.2 ml/kg of body weight, while the second (T2) and the third group (T3) were intramuscularly injected Human chorionic gonadotropin (hCG) @ 200 and 400 IU/kg of body weight, respectively. These the fishes were released back to their respective tanks.

Fishes in the T1 group were bred 10 days after the first hormonal dose whereas those from T3 bred after administration of the second hormonal dose. T2 group fishes did not breed even after the second dose. Further studies are being carried out to find and validate the role, efficacy and optimal dose of administration of these hormones in achieving induced breeding of *C. marulius*.

Broodstock of *Channa marulius*

***Channa marulius* fry**

Development of plankton with application of liquid fermented ric bran (LFRB)

The experiment was set up to develop plankton using liquid fermented rice bran (LFRB). Finely powdered rice bran (1.0 kg) mixed with probiotics (1.0 g) and 5 L of water; kept for fermentation for 96 h under constant aeration at ambient temperature. During the process, pH was adjusted to about 7.0 by adding powdered sodium bicarbonate. This LFRB was used as manure to develop plankton. Two treatments (with and without soil) in FRP tanks (1000 L) filled with bore well water up to 800 L. The fermented rice bran was added @ 5 ppm to each treatment. Phytoplankton was developed after four days of inoculum (LFRB) and zooplankton was developed in 7 days and 10 days in with and without soil, respectively.

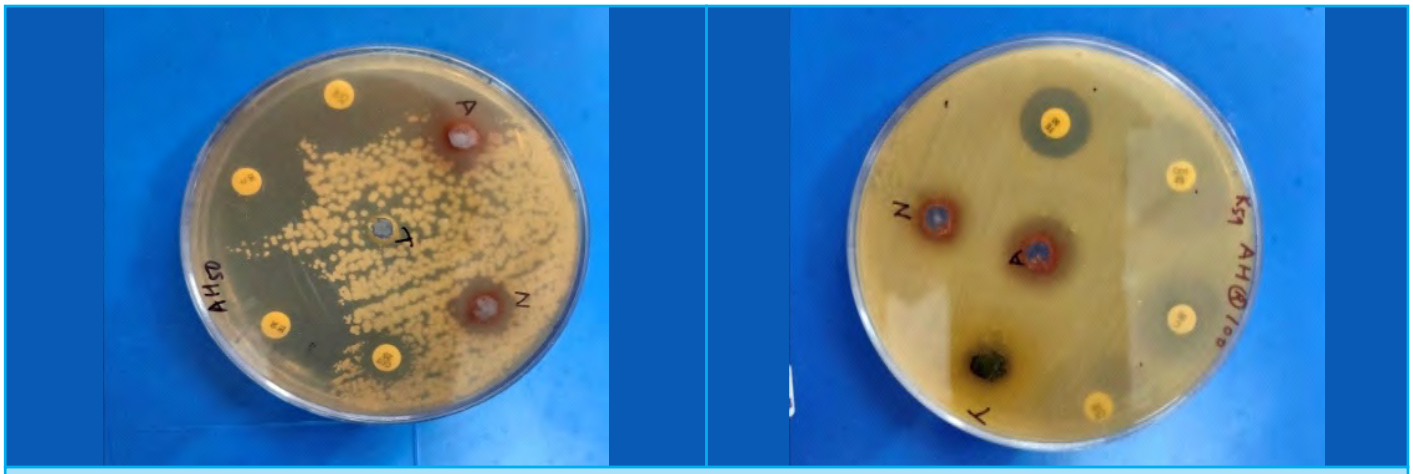
LFRB

Without soil base tank

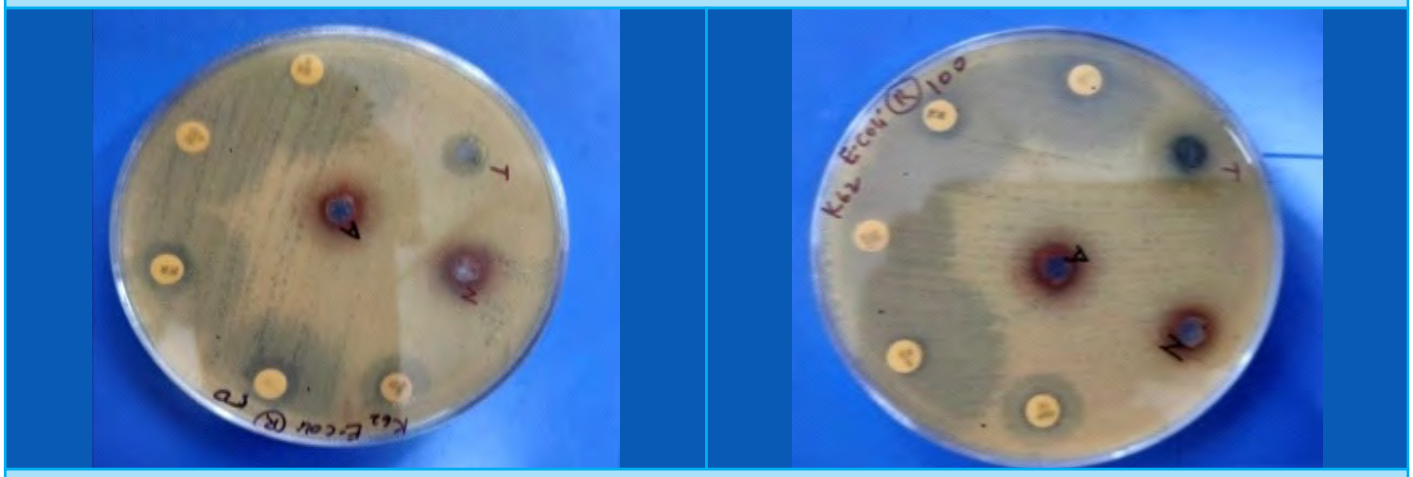
With Soil base Tank

Evaluation of three plant extracts for antibacterial properties against AMR bacteria

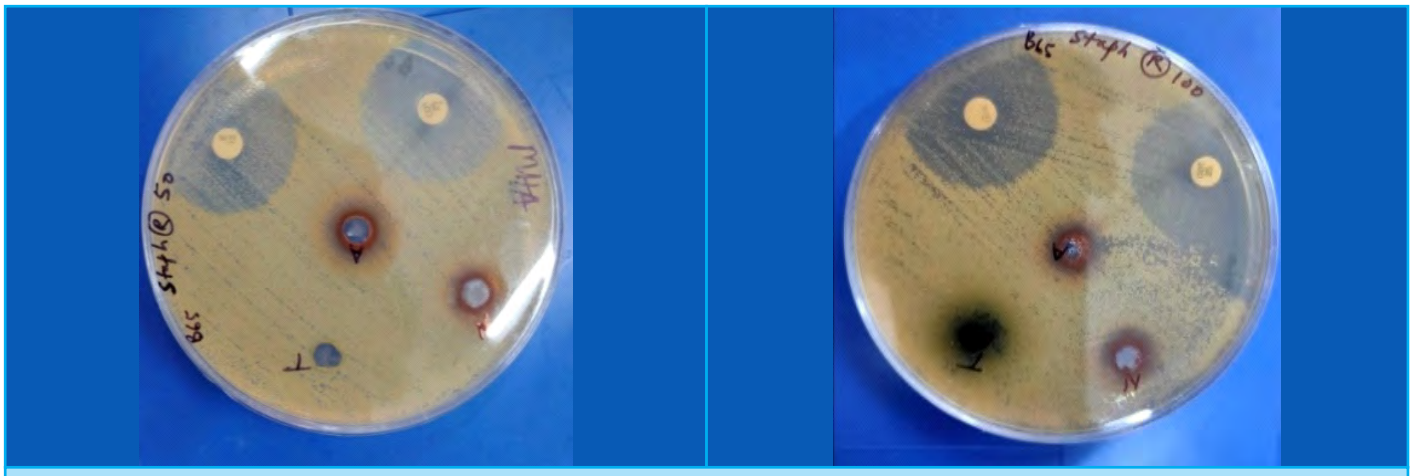
Antibacterial properties of various plant extract namely methanolic bark extracts of *Terminalia arjuna* and *Azadirachta indica* and aqueous leaf extract of *Tridax procumbens* were evaluated against Gram-positive and Gram-negative bacterial isolates. The extracts were diluted in DMSO and tested at 100 mg and 50 mg each against cefoxitin 30 mcg, co-trimoxazole 25 mcg, tetracycline 30 mcg and cephalothin 30 mcg resistant *Aeromonas* sp. The inhibitory effects was found maximum in *T. arjuna* followed by *A. indica* at higher concentration. The extracts were similarly tested against ampicillin 10 mcg, enrofloxacin 5 mcg, cotrimoxazole 25 mcg, tetracycline 30 mcg and cephalothin 30 mcg resistant *E. coli*. However, there was no inhibition recorded with the extracts at both concentrations. In the same line the antibacterial susceptibility test results of erythromycin 15 mcg, cotrimoxazole resistant *Staphylococcus sp.* against the respective extracts were investigated. The result showed that the inhibition effect is reciprocal to dose and *A. indica* bark extract has more antibacterial properties than *T. arjuna*. From the above experiment it was found that *T. arjuna* is showing better results against gram negative bacteria (Aeromonas sp.) and *A. indica* is having a better zone of inhibition against Gram positive bacteria (*Staphylococcus sp.*).



Photos of the zone of inhibition at 50 and 100mg against *Aeromonas sp.*



Photos of zone of inhibition at 50 and 100mg against *E. coli*



Photos of the zone of inhibition at 50 and 100mg extracts against *Staphylococcus sp.*

IMPORTANT EVENTS

The ICAR-CIFA Open Gymnasium Facility was inaugurated by Shri Tage Taki, Hon'ble Minister for Agriculture, Horticulture, Animal Husbandry, Veterinary, Dairy Development and Fisheries, Govt. of Arunachal Pradesh on 31 March, 2021.

34th Annual Day of ICAR-CIFA

The Institute celebrated the 34th CIFA Annual Day on 1st April, 2021. Shri Tage Taki Hon'ble Minister for Agriculture, Horticulture, Animal Husbandry, Veterinary, Dairy Development and Fisheries, Govt. of Arunachal Pradesh as Chief Guest, Dr Pravin Puthra, ADG (MF), Dr B.P. Mohanty, ADG (IF), ICAR and Shri P. K. Bisoi, Secretary, Department of Posts and Chairperson, Postal Services Board, New Delhi graced on the occasion as Guests of Honour. A bunch of twelve philatelic picture postcards (with bilingual descriptions of important freshwater fish species) was released by the dignitaries to mark this occasion. Dr. N. Sarangi, Former Director, ICAR-CIFA; Ms. Tana Yami, Director, Papum Pare Eco Agro, Papum Pare Tea Estate Private Limited, Arunachal Pradesh; Col. Jaleswar Kanhar, Chief Post Master General, Odisha circle also spoke on the occasion. ICAR-CIFA Annual Awards-2020 and Scholarships were also distributed to the awardees. Nine retired employees were also felicitated on the occasion. A training manual on "Laboratory manual on soil and water quality analysis for freshwater aquaculture" was released during the programme. The representatives of ICAR-CIWA; ICAR-CHES Bhubaneswar; NFDB and ICAR-CIFA's retired employees also registered their participation in the function.

Anti Terrorism Day

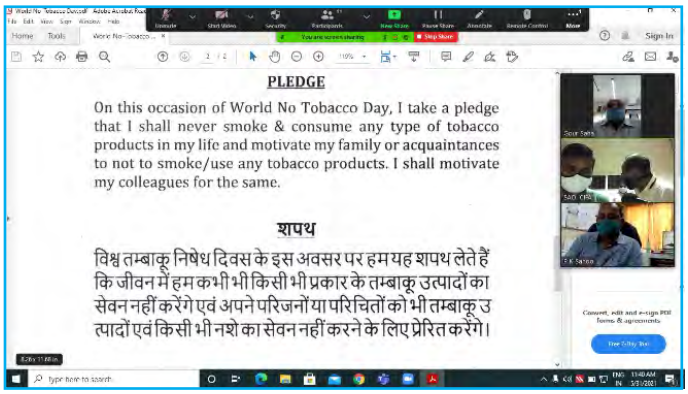
The Institute observed "Anti Terrorism Day" on 21 April, 2021 through Vidoe Conference. All staff members of ICAR-CIFA have participated and taken a pledge on the occasion.

National Virtual Consultation on "Indian Ornamental Fisheries 2.0 - The Way Forward"

ICAR-CIFA in collaboration with DoF, Ministry of Fisheries, Animal Husbandry and Dairying, New Delhi and NFDB, Hyderabad organised the National Virtual Consultation on "Indian Ornamental Fisheries 2.0 - The Way Forward" was organised during 22-24 April, 2021. Hon'ble MoS, MoFAHD & MSME, Shri Pratap Chandra Sarangi, inaugurated this programme in virtual mode and called for indigenous manufacturing of aquariums and the accessories for an *Atma Nirbhar Bharat* and promoting the aquarium hobby thus increasing the production of ornamental fish to develop the ornamental fisheries sector in the country. Other dignitaries for the inaugural programme were Shri Atul Chaturvedi, IAS, Secretary, Department of Fisheries & Animal Husbandry and Dairying, Dr C. Suvarna, IFS, CE, NFDB, Dr J.K. Jena, DDG, Fisheries Science, Dr J. Balaji, IAS, Jt. Secretary, DoF, Dr Dilip Kumar Former Vice-Chancellor, ICAR-CIFE, Dr S.Felix, Former Vice-chancellor, TNJFU, Dr VV. Sugunan, Former ADG, ICAR, Dr S.Raizada, Former ADG (Inland Fy), ICAR and many other scientists and top officials from the ministry participated in the event. The three days consultation covered different thematic areas for discussion such as enhancing the domestic ornamental fish production & constraints in marketing, achieving self-reliance in manufacturing of aquarium accessories, quality feed, medicines & aquatic plants, promoting the domestic retail trade of ornamental fish & hobby promotion, boosting ornamental fish exports and issues in imports, biodiversity concerns & policy issues and research & development priorities, & capacity building. Thirty-two key stakeholders from different key segments of the sector participated in the consultation and shared their opinions and the event was attended by more than 2000 other stakeholders. The concerns raised by the stakeholders were documented properly, compiled and subjected to elaborate discussion during the event. Based on the discussions, a set of draft recommendations were made and circulated for stakeholder opinion. Subsequently a detailed roadmap to be developed for the Ornamental Fisheries Development in India. Dr S.K. Swain, Director, ICAR-CIFA and his team made all the arrangements for the event.

World No Tabaco Day

- The Institute observed "World No Tabaco Day" on 31 May, 2021 through Vidoe Conference. All staff members of ICAR-CIFA have participated and taken a pledge on the occasion.

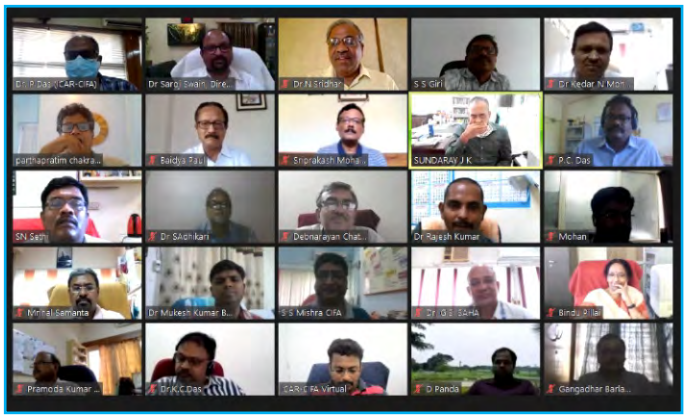


World Environment Day

- The Institute observed World Environment Day on 5 June, 2021 and different plant saplings were planted in the campus by the Director and staff of the institute.

35th Annual IRC meeting

The Institute conducted the 35th Annual IRC meeting during 7-9 June, 2021. Dr. P. Das, Member Secretary, IRC, while welcoming Chairperson and members of IRC, presented the overview of the institute based and externally funded projects along with the agenda of the IRC. He briefed the house about the ongoing, completed, and new projects to be commenced during the IRC. He also mentioned that considerable work is being carried out under the different developmental programmes like STC, SCSP and NEH.



Farmers' Awareness Programme on "Balanced Use of Fertilizers in Freshwater Aquaculture"

ICAR-CIFA and KVK, Khordha organised a Farmers' awareness programme on "Balanced use of fertilizers in freshwater aquaculture" virtually on 18 June, 2021. This event was organized under a series of programs being organized by ICAR, New Delhi to celebrate 75 Years of Indian Independence. Swami Shivakarananda, Principal, Samaj Sevak Kendra, Ramakrishna Mission, Belur Math was the Chief Guest of the meeting. The event was attended by about 140 fish farmers.

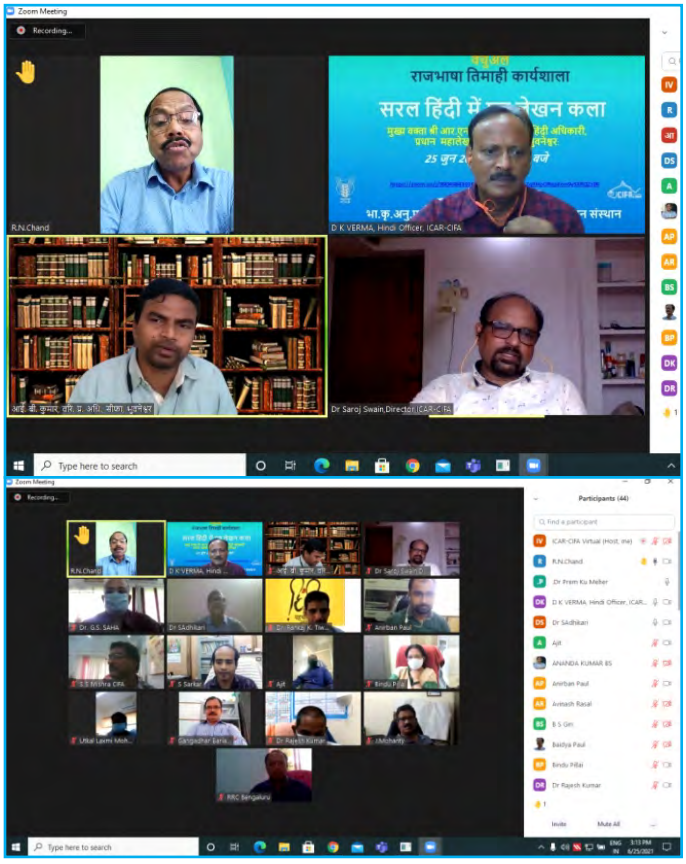
7th International Day of Yoga

The Institute observed "7th International Day of Yoga" on 21 June, 2021 through VC. All staff members have participated.

Quarterly Hindi Workshop Organized

The Institute organized a quarterly official language workshop on "An art of letter writing in simple Hindi " on 25 June 2021 to promote the use of Official Language Hindi in official functions. Almost all scientists, technical officers, administrative staff attended this workshop. Shri Rabindra Kumar Chand, Retired Hindi Officer, Accountant General's Office, Bhubaneswar was invited as the Chief speaker on this occasion. Mr. Indra Bhushan Kumar, Senior Administrative Officer, ICAR-CIFA warmly greeted and welcomed the guests and participants and emphasized to use more and more techniques to do official work easily in Hindi .

On this occasion, guest speaker, Hon'ble Shri Rabindra Kumar Chand, presented a presentation on an art subject of letter writing in simple Hindi through virtual mode. He made a special discussion on the different types of writing of official letters in simple Hindi. He told that this official language is very simple and with the use of techniques, we can easily do the daily official work. This workshop was very beneficial for the officers/employees of the institute.



Dr. Saroj Kumar Swain , Director, ICAR-CIFA emphasized to the Scientists, Technical Officers and other staff of the Institute to promote the use of Hindi in the Institute and to follow the policies of the Official Language so that most of official work would be done in the Official Language. He requested to spread the technology of ICAR-CIFA in Hindi to the stakeholders so that our farmers may get the maximum benefit from it. The program was concluded with vote of thanks by Dr. Dhananjay Kumar Verma, OIC, Official Language ICAR-CIFA.

International Collaboration/Event

USAID project closure workshop on "Scaling Nutrition-sensitive and Innovative Fisheries Technologies through Partnerships in Odisha, India" organized by World Fish on 28 May, 2021.

NACA Webinar on culture-based fisheries for rural development organized by NACA, Bangkok on 31 May, 2021.

EXTENSION ACTIVITIES / TECHNOLOGY TRANSFER

Training Programmes

S. N.	Title of Training Programme	Duration	No. of participants		
			Male	Female	Total
1.	Online training on Seed production and hatchery management of air-breathing fishes (Magur, Singhi, Tengra).	15-17 June, 2021	65	02	67

Technical guidance/service provided (individual)

Months	Samples tested				Tech. queries
	Water	Soil	Fish disease	Feed	
April 2021	23	09	02	--	38
May 2021	10	-	-	--	06
June 2021	46	13	01	--	30
Total:	**79**	**22**	**03**	**--**	**74**

OTHER EXTENSION ACTIVITIES

Farmers Collective Model with Fish Farming Entrepreneurship

A PPP mode livelihood development programme through fisheries activities was initiated in April, 2021 with 50 women of Kumirmari island, Sundarban, West Bengal involving 5 SHG groups (Annadata, Bagna, Golan, Priyajan and Shristi) under technical assistance of ICAR -CIFA funded by WWF with ground monitoring by Wildlife Protection Society, Bali. After initial focused group and door to door survey for understanding benchmark economic and present practices, each beneficiary was provided 15 kg of stunted catla and rohu fingerings along with floating feed after scientific pond preparation. Fishes attained a growth of 100-110 g from 40-55 g within a month, as revealed by the first sampling. An FRP carp hatchery was also installed and operated to ascertain self-sufficiency in fish seed availability.

Training programme at Kumirmari island, Sundarban, West Bengal

A total of 49 nos. of SC women farmers were trained on fish culture, rearing and breeding on 19th June 2021 at Kumirmari island, Sundarban, WB in collaboration

with RRC-Rahara and Kalyani FS. of ICAR-CIFA, WWF, ground monitoring by Wildlife Protection Society, Bali and Bali Nature Cub, funded by Discovery.

ICAR-CIFA partners with WWF to Develop Farmers' Collective with Fish Farming Entrepreneurship

A participatory livelihoods development through farmers' collective was initiated at Kumirmari, Gosaba, South 24 Pargana, Sundarbans, West Bengal on 21 June 2021. ICAR-CIFA, Bhubaneswar as technical partner joins with World Wide Fund for Nature (WWF) and a local NGO i.e., Bali Nature Life Society for this novel initiative. Discovery Inc. is providing funding support for the work. This intends to benefit 50 scheduled caste women representing 5 Self Help Groups namely *Annadata, Bagna, Golap, Priyajan and Shristi*. The Sundarbans is a vast forest and estuarine region and is considered as one of the natural wonders of the world. Now it has been declared as a Ramsar site too. The mangrove forest covers an area of about 10,000 sq. km. in India and 6,000 sq. km. in Bangladesh. Farming is the main source of livelihood of the people living in this delta, however, the salinity level of soils does not allow intensive cultivation of agricultural crops. As a consequence, people depend on the river, forest and - non-timber forest products (crab collection, honey collection, fish farming etc.) fortheir livelihood. Sometimes they have to put their lives at the risk and fall prey to the Royal Bengal tiger and also crocodiles. The struggle for life vs. livelihoods continues.

In order to provide an alternative source of income for such community whose livelihood can be best

described as *'struggling'*, the scientific fish farming in freshwater ponds was initiated. The project will enhance the pond productivity through better management practices for fish production; build capacities of fifty women on fish seed rearing, grow out culture and development of carp brood stock in the island. Benchmark surveys and focus group discussions were carried out by a multidisciplinary team of scientists. All the adopted ponds were stocked with 15 kg advance fingerlings of Indian major carp and the beneficiaries were trained on post stocking management measures. Application of lime and pellet feed was also demonstrated by a team of scientists led by Dr P P Chakraborty, Principal Scientist. Fish attained an average growth of about 55-65 g in 2 months. One FRP carp hatchery was also installed and operated to ensure self-sufficiency in fish seed availability. Dr S Adhikari and Dr H K De, Principal Scientists of the institute are also associated with this project.

Miscellaneous activities

Dr. Shailesh Saurabh, Senior Scientist delivered a talk on 'Freshwater pearl farming' in Naxatra News TV Channel on 22 April, 2021.

Dr. S.S. Giri, HoD, FNPD and Head (I/c), ICAR-KVK, Khordha delivered a talk on 'Entrepreneurship development in fish feeds' in Naxatra News TV Channel on 27 May, 2021.

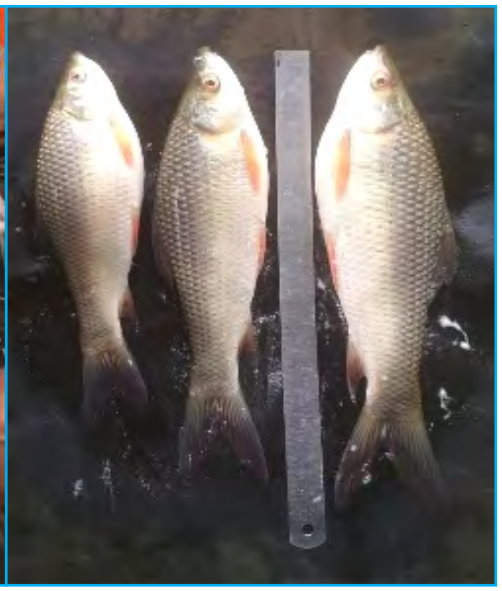
Distinguished Visitors

Shri Tage Taki, Hon'ble Minister for Agriculture, Horticulture, Animal Husbandry, Veterinary, Dairy Development and Fisheries, Govt. of Arunachal Pradesh visited the Institute during 31 March – 1 April, 2021 on the occasion of ICAR-CIFA Annual Day. He also visited the farm facilities.

Dr Pravin Puthra, Assistant Director General (Marine Fisheries) visited the Institute during 31 March – 2 April, 2021.

NEH activities

A meeting was initiated at Kalyani on 18 June, 2021 regarding the venture of fish culture at Silchar with Industry-Farmer collaboration by adopting ICAR-CIFA technologies to increase fish production in Barak Valley, Silchar, Assam.



Odisha

Carp grow out (Floating) feed of 3 mm was distributed as aquaculture input support to 27 SCSP farmers of Kendrapara district in presence of District Fisheries Officer, Kendrapara on 09 April, 2021.

West Bengal

Farmers' Meeting at Aquaculture Farmer Field School (AFFS), Sonarpur

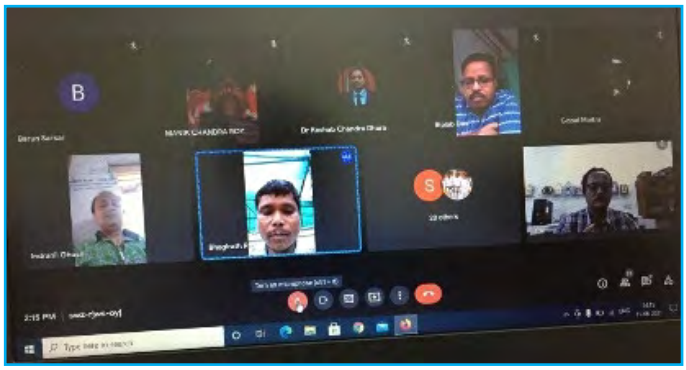
A meeting was conducted by Mrs Suniti Mondal, the operator farmer of AFFS of Saheberabad I village, Sonarpur block, South 24 Parganas on 9 April, 2021. A total of 20 farmers (Farm women -7 & farmers 13) participated in this meeting. In another meeting on 20 April, 2021, 46 Farmers (Farm women -14 & other farmers-32) have participated in the AFFS meet. They discussed about the acute shortage of water in the stocked pond, water quality issues and fish disease problems in some ponds. Once they contacted Regional Research Station, Rahara; technical supports were provided for remedial measures.

Farmers' Meeting at Ornamental Aquaculture Field School (OAFS) at Jalpaiguri

The fish farmers meet was organized by Sri Bhagirath Roy of Prabhupara village, Sadar Block, Jaipaiguri, West Bengal on 8 April, 2021 where 42 farmers (Farm women-20 & other farmers-22) attended the meeting. Mr. Bhagirath Roy is the operator farmer for OAFS which was established by ICAR-CIFA on 7 February, 2021. Mr. Manas Das from Jalpaiguri Krishi Vigan Kendra of WBUAFS also participated in the meeting. The farmers expressed their interest in ornamental fish farming and want to do the same for their future livelihood.

Scientists and Farmers' interaction through Zoom Meeting

A farmers' meeting was held on Zoom Platform on 11 June, 2021 where 40 farmers of Malkani hat, Sadar Block of Jalpaiguri district were present. Dr. S. Adhikari, SIC and Dr. B. N. Paul, Nodal Officer, SCSP interacted with the farmers and provided valuable technical inputs to the farmers. The programme was alos attended by SMS (Fisheries), KVK, Jalpaiguri.



Zoom meeting of farmers' of Dinhata block of Cooch Behar district of West Bengal

An online zoom meeting was conducted for the SC farmers of Dinhata I and II block of Cooch Behar district on 29 June, 2021. The meeting was attended by 13 farmers of Cooch Behar. In the meeting Dr. S Adhikari, SIC, RRS, Rahara welcomed the participants and briefed about the SCSP activities undertaken last year. Dr.B.N.Paul, Nodal Officer, SCSP Scheme, West Bengal taught the participants on feeding of farm-made feeds prepared by using the local feed ingredients and its dispensing process. Dr Adhikari discussed about pond preparation and the importance of water quality for profitable aquaculture. There was Scientists and Farmers' interaction meet on different aspects of aquaculture practices. The farmers clarified their doubts about fish culture during the interaction session.

Vijayawada

Total 44 farmers and fishermen from Suryapet District, Telangana and the 62 and 60 farmers and fishermen from Krishna and Guntur District, Andhra Pradesh were selected as beneficiaries under the SCSP programme.

AWARDS

The ICAR-CIFA Annual Awards (for the year 2020) were presented to the following during Annual day on 1 April, 2021:

Category	Winner
Best Division/Section/Unit/ Research Groups	Fish Genetics and Biotechnology Division
Best Scientist (above 40 years)	Dr J.K. Sundaray, Principal Scientist and Head (I/C), FGBD
Best Scientist (below 40 years)	Mr Anirban Paul, Scientist, FHMD
Best Technical staff member	Shri D. P. Rath, STO, Social Science Section
Best Administrative Person	Shri Lokanath Senapati, Assistant, Estt-I
Best Supporting / Field Staff	Shri Laxmidhar Behera, SSS, APED Shri Pramod Kumar Khatua, SSS, APED
Best Extension Worker	Dr Shailesh Saurabh, Sr. Scientist, APED
Best Research Scholar	Miss Simantini Shasani, SRF, Social Science Section
Award for School Children Best Boy Child Award for the highest scorer in Class-X in 2020	Mr Abhisekh Mohanty (S/o Mr Sisir Kumar Mohanty, STO)

DR B. R. MOHANTY AND DR T. RAMAPRABHU MEMORIAL AWARDS-2020

Category	Winner
Dr T. Ramaprabhu Memorial Award	Miss Simantini Shasani, SRF, NIMA Project
Dr B. R. Mohanty Memorial Award	Er. Sandip Kumar Panda, YP-II, AICRP on PEASEM

Smt. S. Susheelamma Memorial Scholarship (2019-2020)

Siba Prasad Mohapatra, S/o Mr. Gopal Ch Mohapatra

Girish Chandra Chaudhuri Memorial Scholarship (2019-2020)

Post-Matriculation	Archana Priyadarshini, D/o Mr. Bhikari Charan Bhoi
Post-Graduation	Bandana Priyadarshini, D/oMr. Bhikari Ch Bhoi

Other Award/Recognition

- Dr B. C. Mohapatra, Principal Scientist received the Best Scientist Award from "EET CRS Research Wing for Excellence in Professional Education & Industry" in the "9th Academic Brilliance Awards–21" Ceremony of Educationexpo.tv held at Hyderabad on 7 March, 2021.
- Dr B. C. Mohapatra, Principal Scientist received Best Scientist Indian Achievers' Award 2020-21 in Recognition of Outstanding Professional Achievement & Contribution in Nation Building from Indian Achievers' Forum, New Delhi.

PROMOTION

- Dr Bibhudatta Mishra, T-6 promoted to T-7-8 w.e.f. 4 January, 2019.

SUPPERANNUATION

- Sri Debendra Tarai, T-4 w.e.f. 31 May, 2020

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