



GAUHATI UNIVERSITY

A NAAC 'A' GRADE INSTITUTION

GOPINATH BARDOLOI NAGAR, JALUKBARI
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SUPPORTING DATA

NAAC 4TH CYCLE OF ACCREDITATION

PROVIDED BY-

IQAC, GAUHATI UNIVERSITY

CRITERION 3

Assessment term: 2018-2023

Sub criterion 3.7

Collaborations



**Academic and research collaboration between
University of Naples, Federico-II, Italy
Department of Chemical Sciences
And
The University of Gauhati, India
Department of Botany, Gauhati University**

(Activity Report)

An agreement for academic and research collaboration between University of Naples, Federico-II, Italy Department of Chemical Sciences and The University of Gauhati, India Department of Botany, Gauhati University was signed on 14th December, 2017 by the Registrar Gauhati University and for University of Naples, represented by the manager pro-tempore Prof. Rosa Lansetta. Thereafter a series of online discussion regarding the collaboration was work out. It was finally decided to explore the bioactive metabolites of endophytic fungi of some potential medicinal plants of North East India. The isolation, identification and preliminary biological activity of the endophytic fungi was carried out at Department of Botany, Gauhati University and separation, purification and structure elucidation of the bioactive metabolites was carried out by Department of chemical sciences, University of Naples.

The collaborator of Department of Botany, Gauhati University was represented by the following:

1. Prof. Kumananda Tayung, (Co-ordinator)
2. Prof. Dhurva Kumar Jha (Group Leader)
3. Dr. Diganta Narjary (Member)
4. Dr. Jintu Rabha (Member)

The collaborator of Department of Chemical Sciences, University of Naples was represented by the following:

1. Prof. Alessio Cimmino (Co-ordinator)
2. Prof. Antonio Evidente (Group leader)
3. Dr. Marco Masi (Member)

After series of discussion and research collaborative work, it was decided for academic exchange program by visiting the respective Departments and vice-versa. Accordingly, Prof. Antonio Evidente has decided to visit Department of Botany, Gauhati University, India on 4-16 February 2019 (Program enclosed). Unfortunately due to his health problem at the last moment he has to

cancel the visit. Thereafter, the collaborator of Department of Botany, Gauhati University was invited to University of Naples, Department of Chemical Sciences (Invitation letter enclosed). Prof. Kumananda Tayung (Co-ordinator) and Prof. Dhurva Kumar Jha (Group leader) visited University of Naples from 12th October, 2019 to 22nd October, 2019. A series of lectures were delivered and interacted with faculty members and research scholars. Thereafter due to ongoing corona virus pandemic the collaboration was halted from 2020 to 2021. The collaboration again resumed by 2022 and as part of academic exchange for student's two research scholars from Gauhati University: i) Miss Anindita Sarma, Botany Department and ii) Miss Pinakinee Phukan, Chemistry Department visited University of Naples, Department of Chemical Sciences for two months with funded fellowships sponsored by University of Naples from September-October, 2023 to carry out their research work.

Following are activities of the Scholars:

1. Name: Anindita Sarma

Supervisor: Prof. Kumananda Tayung

Designation: Ph.D. research scholar, Department of Botany, Gauhati University

Purpose of visit: The purpose of the visit to the University of Naples, Italy was under a collaborative program between Gauhati University, Assam, India and University of Naples, Italy to learn new techniques and handling of new instruments, to characterize the metabolites with chromatographic techniques, to explore potential research collaborations and to exchange ideas with faculty members and researchers in relevant fields.

Activities:

1. Opportunity to work in the laboratory of Prof. Alessio Cimmino and Dr. Marco Masi of Department of Chemical Sciences, University of Naples, Italy for purification and characterization of the endophytic fungal metabolites isolated from endophytes inhabiting *Solanum pimpinellifolium*, a wild and underutilized variety of tomato.
2. Learned to separate the organic extracts through column chromatography with silica gel column (Kieselgel 60, 0.063-2.000 mm, Merck, Darmstadt, Germany) using different solvents. Moreover, the process of doing a reverse column has also been taught.
3. Additionally, learnt to purify the metabolites by preparative and analytical TLCs (Kieselgel 60, F₂₅₄, 0.5 mm, Merck, Darmstadt, Germany).

4. During the visit, had the opportunity to operate ^1H NMR 500 MHz Bruker Anova Advance (Karlsruhe, Germany) spectrophotometer.
5. In addition, acquired the experience to operate Electrospray Ionization/Mass Spectrometry (ESI-MS) on a LC/MS TOF apparatus Agilent 6230B (Agilent Technologies, Milan, Italy).

Outcomes:

1. Two pure compounds were obtained from the ethyl acetate extract of *Penicillium sumatraense* and with NMR spectroscopy and ESI-MS data it was confirmed to be Curvularin and Sumalactone A. These pure compounds were reported to have fungicidal activity.
2. The organic extract of *Colletotrichum gloeosporioides* revealed the presence of one pure compound Indole-3-acetamide after confirming by ^1H NMR and ESI-MS. This compound is reported to be the precursor of Indole acetic acid in the biosynthetic pathway of auxin and possess growth promotion activity.
3. The pure compounds have been brought back to the laboratory for further biological assays.

Name: Pinakinee Phukan

Supervisor: Prof. Prodeep Kumar Phukan

Designation: Ph.D. research scholar, Department of Chemistry, Gauhati University

Aim and Objective: Assam is considered as one of the most significant biodiversity hotspots of the world. This region is blessed with rich natural resources which have attracted the attention of natural product chemists. Although, many medicinal plants have been identified and bio-evaluation has been undertaken, many plants are yet to be explored. Based on traditional medicinal uses and availability in Assam, India we have selected two plant species viz Polygnum Chinese (local name: Madhu Soleng) and Oroxylum indicum (local name: Bhat Ghila) for detection, isolation, and identification of biologically active compounds responsible for some specific medicinal activity. The extracts of the plant materials were prepared in our laboratory by using maceration technique. Then in this two-month scientific stay we have done the purification and isolation of bioactive fractions from these two plant extracts using the techniques available in SNAB Lab, department of Chemistry, University of Naples, Italy.

Methods Used: The following techniques have been used in purification and separation of the bioactive metabolites

1. Thin Layer Chromatography

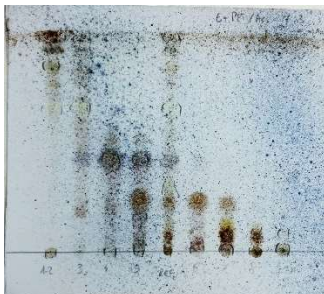


Fig: TLC of the fractions of Oroxyllum Indicum in Petroleum Ether: Acetone (7:3)

2. Column Chromatography:



Fig: Column Chromatography of one of the fractions of Oroxyllum Indicum in Petroleum Ether: Acetone

3. Preparative Thin Layer Chromatography:

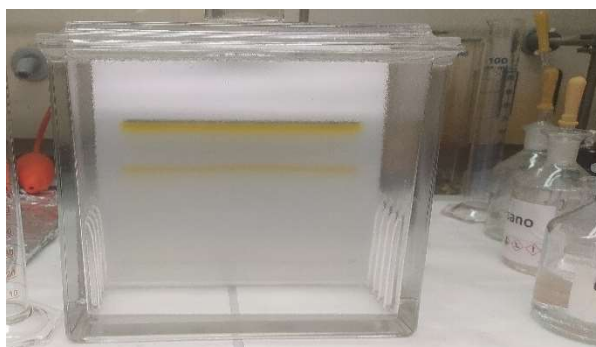


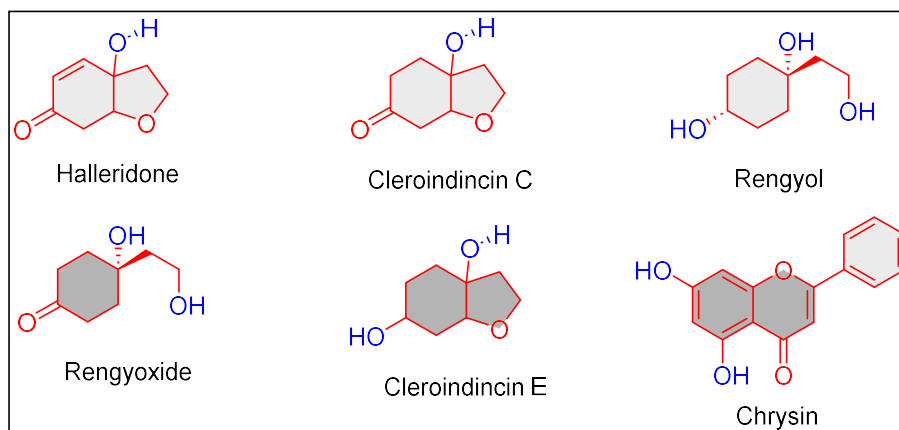
Fig: Representative preparative TLC of one of the fractions of Oroxyllum Indicum

4. Nuclear Magnetic Resonance Spectroscopy

5. ESI- Mass Spectroscopy

Outcome of the study:

Six different metabolites have been isolated so far from this study. The name and structure of the compounds are as follows-



The collaboration ended in the December 2023. Below are some of outcomes of the collaboration in term of publications, some are communicated and still under process:

Publications

Padhi, S., Masi, M., Mohanta, Y.K., Saravanan, M., Sharma, S/. Cimmino, A, Shanmugarajan, D, Evidente, A., **Tayung, K** and Rai, A.M. 2023 *In silico* pharmacokinetics, molecular docking and dynamic simulation studies of endolichenic fungi secondary metabolites: An implication in identifying novel kinase inhibitors as potential anticancer agents. Journal of Molecular Structure 1273: 134390 .<https://doi.org/10.1016/j.molstruc.2022.134390>

Talukdar, R., Padhi, S., Rai, A.K., Masi, M., Evidente, A., Jha, D.K., Cimmino, A., **Tayung K.** (2021). Isolation and Characterization of an Endophytic Fungus *Colletotrichum coccodes* Producing Tyrosol from *Houttuynia cordata* Thunb. using ITS2 RNA Secondary Structure and Molecular Docking Study. Frontiers in Bioengineering and Biotechnology. 9: 650247. doi: 10.3389/fbioe.2021.650247

S. Padhi, M. Masi, A. Cimmino, Tuzi, A. Jena, S. A. Evidente and **K. Tayung** (2019). Funiculosone, a substituted dihydroxanthene-1,9-dione with two of its analogues produced by an endolichenic fungus *Talaromyces funiculosus* and their antimicrobial activity. *Phytochemistry*. 157:175-183.

S. Padhi, M. Masi, A. Cimmino, S.K. Panda, W. Luyten, A. Evidente and **K. Tayung** (2018). Antimicrobial secondary metabolites of an endolichenic *Aspergillus niger* isolated from lichen thallus of *Parmotrema ravum*. *Natural Product Research*. doi.org/10.1080/14786419.2018.1544982



Fig. 1: With the collaborators of University of Naples, Department of Chemical Sciences



Fig. 2. Prof. K. Tayung delivering lecture interacting with faculty members & scholars of University of Naples, Department of Chemical sciences



Fig. 3. Interacting with faculty members of Department of Chemical Sciences, University of Naples



Fig. 4: Discussion with the Group leader, Prof. Antonio Evidente



Fig. Scholars with the collaborators during the visit



Fig. Scholars of Gauhati University with Scholars of University of Naples

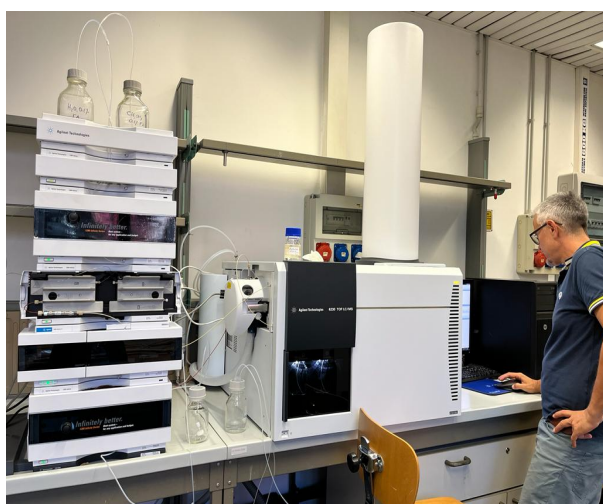


Fig. Scholars of Gauhati University working and availing the laboratory facilities at Department of chemical sciences University of Naples

Activities through Collaboration in the Department of Geography, Gauhati University

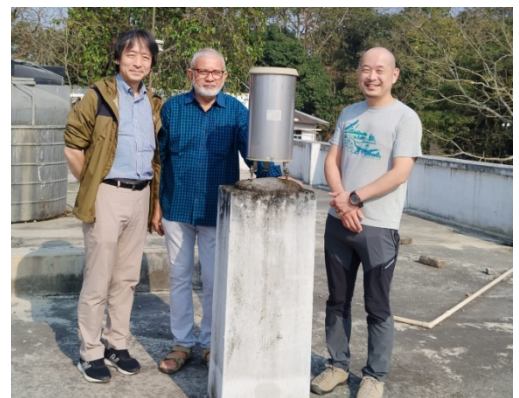
Collaboration between the Department of Geography, Gauhati University and Kagawa University, Japan

After the successful completion of the joint collaboration research programme held between the Kyoto University of Japan and the Department of Geography, Gauhati University (GU) during 2006-2010, the Department of Geography, GU had again made an international collaboration with the Faculty of Education, Kagawa University, Japan in 2015 for a period of 5 years, i.e. upto 2020 to promote academic exchange and cooperation between the two institutes and countries. The main purpose of this joint collaboration programme is to carry out some research activities in the field of climate change and associated issues. The notable activities done so far under this collaboration programme were – (i) exchange of scientific materials, especially rain gauges, publications of research outputs and sharing of climate data and information, (ii) exchange of faculty members between the two institutes, (iii) joint research including field works and meeting for research activities, etc.



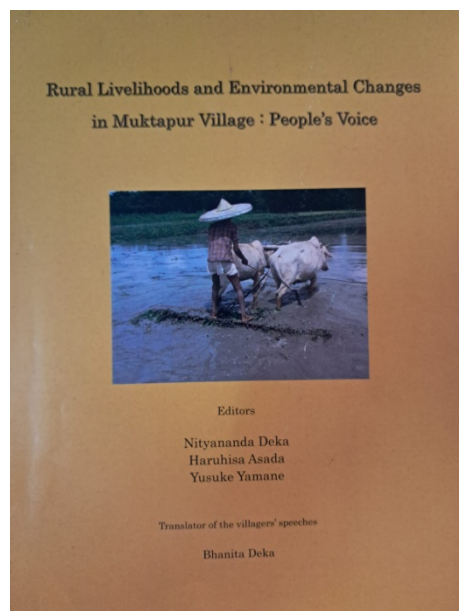
Under this joint collaboration programme, Dr Prasant Bhattacharya, faculty member of Geography Department, GU visited the Kagawa University, Japan in February, 2015 to attend an international seminar related to climate change and urban environment.

As a part of this programme, the member from the Japanese counterpart used to visit 14 rain gauge stations established in different parts of Assam to maintain and download the annual rainfall data every year, especially during the months of February and March. In such occasions, they exchange the idea of rainfall variability and associate climate change issues with the local people of the respective sites and nearby academic institutions including the students/ research scholars and faculty members of the Department of Gauhati University. A website has already been developed by the Japanese counterpart to present the rainfall data generated from the concerned rain gauge station and to make the rainfall data available for the researchers of both the institutes.



Village Level Workshop organized by the Dept. of Geography, GU in collaboration with the Nara Womens' University and Tokoha University, Japan

A village level workshop was organized by the Department of Geography, Gauhati University in collaboration with the Nara Womens' University and Tokoha University of Japan at Muktapur village of Assam on 25th August, 2019 to interact with the rural people, and to understand their perception on the climate change issues and the climate change adaptive measures adopted by the villagers. About 100 local villagers along with the faculty members of the Department of Geography, GU, Nara Womens' University and Tokoha University participated in the workshop and delivered their opinions. Based on their opinions on environmental/climate change, an edited book entitled “ Rural Livelihoods and Environmental Changes in Muktapur Village: Peoples' Voice was published in 2020.



Photos of the workshop



Online Interaction between Geography Students of Gauhati University and Nara Women's University, Japan

The Department of Geography, Gauhati University organized an online interactive programme among the PG students of Geography of Gauhati University and UG students of Geography of Nara Women's University, Japan on 24th June, 2021 in Zoom platform. About 92 participants from both the universities shared their experiences with respect to importance of geography education, and prevailing physical and socio-cultural practices in Japan and Assam of India.

Involvement of Faculty member of the Dept of Geography, GU as an overseas research collaborator in an International project by Okayama University of Science, Japan

The Okayama University of Science, Japan under its international project on “Interdisciplinary Study for Solving Global Issue by Shifting Disaster Theory in Asian Monsoon Region” funded by JSPS for the period of 2022-2027 has involved Dr Nityananda Deka, faculty member of the Geography Dept, GU as an overseas research collaborator in the project to carry out flood and climate change issues in the Brahmaputra Valley, Assam. Under this programme a research scholar under the supervision of Dr N Deka of the Department visited Nepal and Bangladesh, and in October, 2023 Dr N Deka was invited by the Okayama University of Science to attend an international workshop on “Comprehensive Comparison of Disaster Situations and Responses in the Asian Monsoon Region”, and to conduct a field study in a flood-prone area of Mabichu, Kurashiki region of Japan.



Collaborative Research of Department of Geography, GU with Freie University Berlin on Small Scale Tea Cultivation in Assam

The Centre for Development Studies, Freie University (FU) Berlin with Principal Investigator Dr. Stefan Schutte has been conducting a research project on “Small holding tea cultivation in

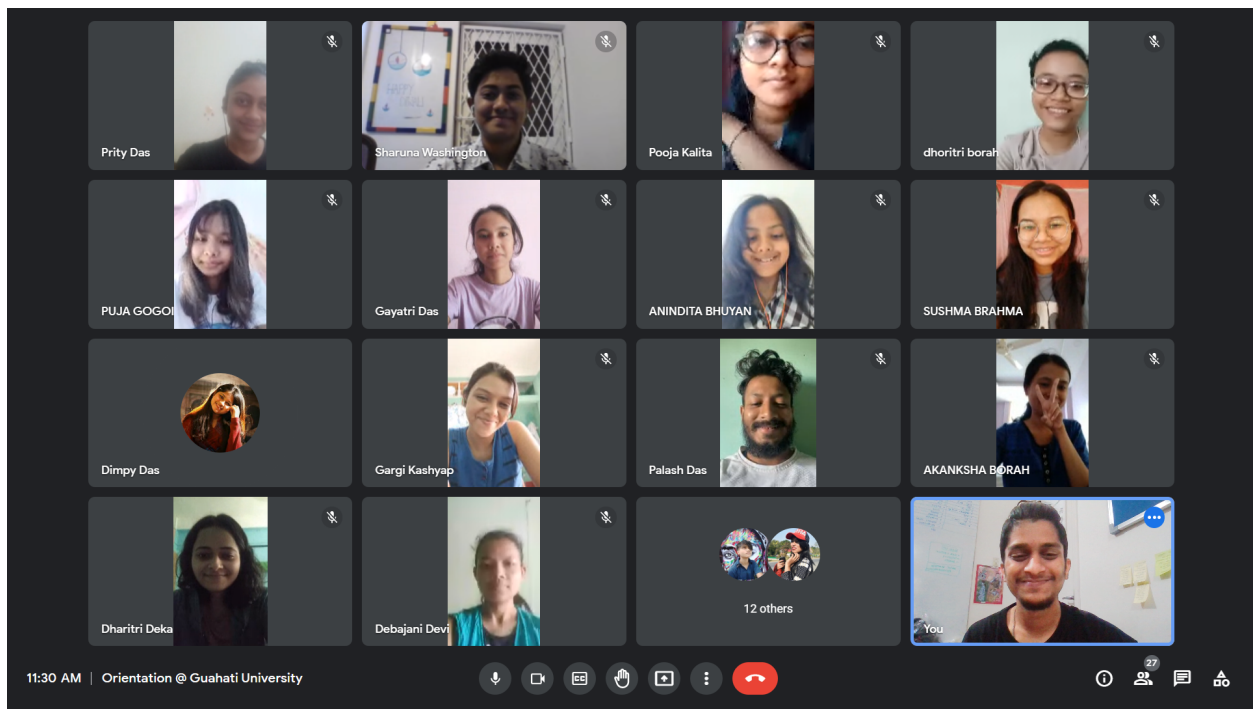
Assam” funded by German Research Foundation since late 2020 in collaboration with Prof. Bimal K. Kar, Department of Geography, Gauhati University (GU) as an overseas co-investigator. As a part of this project three doctoral students, viz. Mr. Vincent Bottner and Ms. Marie Hamayel-Peters in FU under the supervision of Dr. Stefan Schutte and Prof. Hermann Kreutzmann of FU, and Ms. Jeshmi Machahary in GU under the supervision of Prof. Bimal K. Kar, GU and Prof. Hermann Kreutzmann, FU have been carrying out their Ph.D. research works on different aspects of small-scale tea cultivation in Sonitpur and Udalguri districts. As a part of this project, Prof. Kreutzmann and Dr. Schutte visited Department of Geography, GU on 11 th October, 2022 and interacted with the faculties, research scholars and students on the contemporary trend of geography education and research in Germany. They also shared their experiences on development related research works carried out by them in different countries of central and south Asia. Further, with a view to strengthen academic interest among the students of the Department of Geography, GU and students of FU, a joint filed study in and around Guwahati city was conducted during late September, 2022 towards understanding diverse environmental and socio-economic issues from geographical perspectives.



Engagements with Gauhati University

SI No.	Dates	Topics
3.	29th Aug 2021	Conversations on Gender and Sex
1.	5th Sept 2021	Social Contract Theory
2.	10th Nov 2021	Meet up after the offline session.
4.	18 December 2021	Stereotypes & taboo topics linked with the same using the Gender Curriculum
5.	08 January 2022	Gender Stereotypes
6.	22 January 2022	Gendered conversations
9.	16 April 2022	Conversation on gender stereotypes
7.	07 May 2022	Gender gap
8.	24 May 2022	Mental Health Awareness Program
10.	5 TH November, 2022	Orientation about Durga India
11.	19 November, 2022	Baseline Impact Assessment
12.	07 January, 2023	Creating Durga Safety Champions
13.	04 Feb, 2023	Voice Lab creating Discussion

Photos



11:59 AM | Introduction to Voice Lab/Games & Activities @ G...

Participants visible in the grid:

- Pooja Kalita
- Sweta Shivam
- dhritri borah
- ANINDITA BHUYAN
- MARTINA BORKAKATI
- Nilashree Nath
- Dimpy Das
- Sukanya Bhargadwaj
- Palash Das
- Jwisi Basumatary
- You

Meeting controls: Microphone, Video, Chat, Hand raise, Screen share, More options, End call.

Meet - ytc-tnep-quo

meet.google.com/ytc-tnep-quo?pli=1

Participants visible in the grid:

- Punam Newar
- Gargi Kashyap
- Dharitri Deka
- SUSHMA BRAHMA
- AKANKSHA BORAH
- Kevin Noel Sequeira
- Sharuna Washington
- dhriti borah
- PUJA GOGOI
- Palash Das
- Prity Das
- Gayatri Das
- Debjani Devi
- Pooja Kalita
- 12 others

Notification: Punam Newar has raised a hand. Open queue

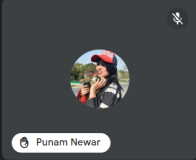
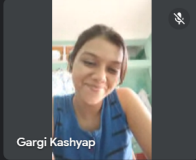
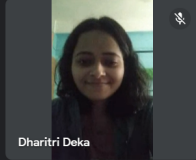
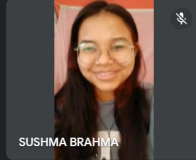
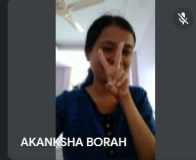
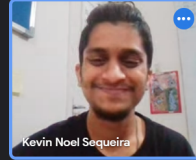
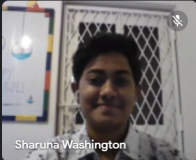



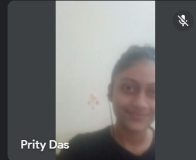

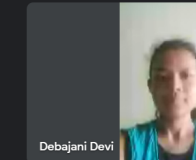
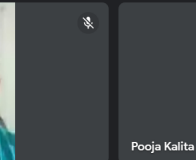
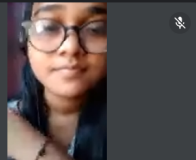
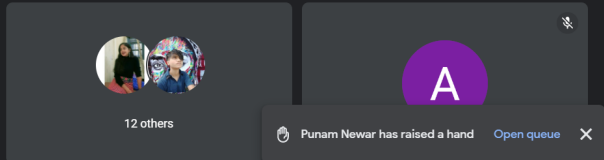
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Meet - ytc-tnep-quo

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Gmail YouTube Maps News Prime Video WhatsApp Watch Korean Dra... Instagram Google Google Drive YouTube Co-WIN Application Amazon.com: Spen... Netflix

 Punam Newar	 Gargi Kashyap	 Dharitri Deka	 SUSHMA BRAHMA	 AKANKSHA BORAH	 Kevin Noel Sequeira
 Sharuna Washington	 dhoritri borah	 PUJA GOGOI	 Palash Das	 Prity Das	 Gayatri Das
 Debajani Devi	 Pooja Kalita	 12 others	 Punam Newar has raised a hand Open queue		

11:30 AM | ytc-tnep-quo

Microphone, Camera, Chat, Hand, Screen Share, More, End Call



Pooja Kalita

Sweta Shivam

dhoritri borah

ANINDITA BHUYAN

MARTINA BORAKAKATI

Nilashree Nath

Dimpy Das

Sukanya Bharadwaj

Palash Das

Jwisi Basumatary

You

11:59 AM | Introduction to Voice Lab/Games & Activities @ G...

Outcomes of Collaborations

	MoU with	Activity
1.	Start-up Assam	<ol style="list-style-type: none"> 1. An outreach programme of Assam Start-Up was organized on 31 August, 2019 at the P. D. Hall. About 180 students of the University, USTM, Gauhati Commerce College etc took part. 2. A Start-Up event named Utkranti was organized on 14-15 September, 2019 at 9.30am at GUIST seminar hall. Start-Up Assam was a collaborator. 3. In line with the Hon'ble Prime Minister's Startup India's vision, Startup India Assam Yatra has been organized by Startup India Team in collaboration with Start-Up Assam, Govt of Assam. A Bootcamp was held at Gauhati University on 21 January, 2019 from 9.30 am onwards at the PD Hall. Around 150 students took part.
2.	Saint-Petersburg Electrotechnical University "LETI", Russian Federation	<p>Over three journal (all SCI) and few international conference proceedings publication; organization of lecture series; eg.s</p> <ol style="list-style-type: none"> I. Dmitrii Kaplun, Surajit Deka, Arunabh Bora, Nupur Choudhury, Jyotishman Basistha, Bhaswadeep Purkayastha, Ifthikaruz Zaman Mazumder, Vyacheslav Gulvanskii, Kandarpa Kumar Sarma, Debashis Dev Misra, "An Intelligent Agriculture Management System for Rainfall Prediction and Fruit Health Monitoring", Scientific Reports, vol. 14, no. 1, 512, pp.- 1-23, (I.F.- 4.6), 2024. II. Kandarpa Kumar Sarma, Kunal Kingkar Das, Vikash Misra, Samadrita Bhuyia and Dmitri Kaplan, "Learning Aided System for Agriculture Monitoring Designed Using Image Processing and IoT-CNN", IEEE Access, vol. 10, pp. 41525- 41536, April, 2022. doi 0.1109/ACCESS.2022.3167061, IF.-3.367. III. Dmitrii Kaplun, Alexander Voznesensky, Alexander Veligosha, Igor Kalmykov and Kandarpa Kumar Sarma, "Technique to adjust adaptive digital filter coefficients in Residue Number System based filters", IEEE Access, June, 2021. I.F 3.27
3.	Technical University Sofia Bulgaria	<p>Several journal (all SCI) publications. Eg.</p> <ol style="list-style-type: none"> I. Aradhana Misra, Manash Pratim Sarma, Kandarpa Kumar Sarma, and Nikos Mastorakis, "Temporal Deep Learning Assisted UAV Communication Channel Model For Application in EH-MIMO-NOMA Set-up". IEEE Journal of Communications and Networks, vol. 24 no. 2, pp. 166 - 183. 10.23919/JCN.2021.000045, IF 3.24. II. Purabi Sharma, Kandarpa Kumar Sarma and Nikos E. Mastorakis, "Artificial Intelligence Aided Electronic Warfare Systems- Recent Trends and Evolving Applications", IEEE Access, Vol. 8, pp. 224761 - 224780, 2020 (I. F- 3.27). III. Manami Barthakur, Kandarpa Kumar Sarma and Nikos Mastorakis, "Modified Semi-Supervised Adversarial Deep Network and Classifier

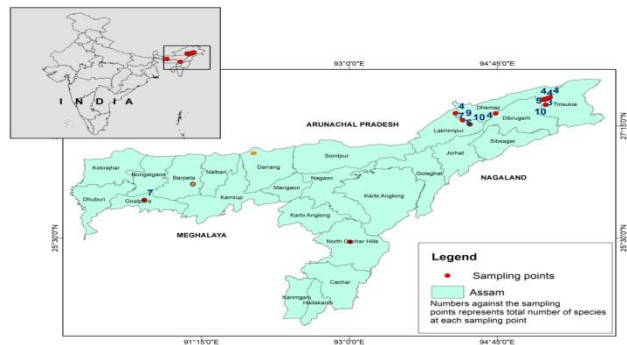
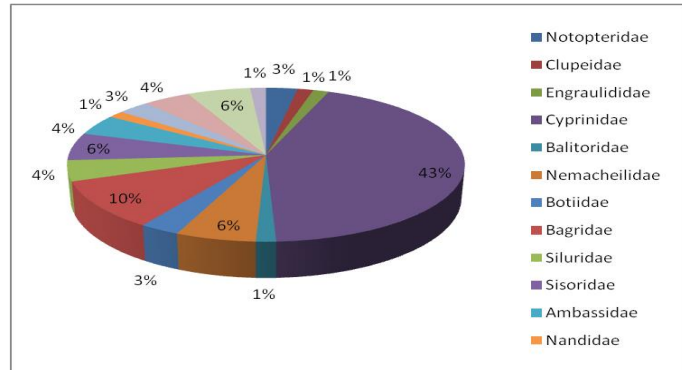
		<p>Combination for Segmentation of Satellite Images”, IEEE Access, vol. 8, pp. 117972-117985, 2020 (I.F- 3.27).</p> <p>IV. Manasjyoti Bhuyan, Kandarpa Kumar Sarma and Nikos Mastorakis, “Nonlinear Mobile Link Adaptation Using Modified FLNN and Channel Sounder Arrangement”, IEEE Access, vol. 5, 10390-10402, June, 2017. (I.F- 3.37)</p> <p>V. Manasjyoti Bhuyan, Kandarpa Kumar Sarma and Nikos Mastorakis, “Neuro-Computational Frameworks for Non-linear Stochastic Wireless Channels”, Springer Evolving Systems, vol. 8, no. 2, pp 109120, June 2017. (I. F- 2.5)</p>
4.	Assam Engineering College and ASTU	<p>Several workshops and publications</p> <p>A five day workshop named <i>Emerging Technologies, Innovation, Incubation and Entrepreneurship Development</i> was organized between 23 - 24 February, 2019 by Centre for Development of Advanced Computing (CDAC), A Scientific Society of Ministry of Electronics and Information Technology (MeitY), Government of India with Dept. of ECE and Dept. of IT, Gauhati University, Gauhati University Technology and Dept. of CSE, Assam Engineering College. The workshop focused on innovation, IPR, entrepreneurship, incubation and related aspects.</p> <ol style="list-style-type: none"> 1. Bijuphukan Bhagawati, Kandarpa Kumar Sarma and Kanak Chandra Bora, “ An automated approach for human-animal conflict minimization in Assam and protection of wildlife around the Kaziranga National Park using YOLO and SENet Attention Framework”, Ecological Informatics, (in press), 2023 (I.F- 5.1). 2. Gautam Chakraborty, Mridusmita Sharma, Navajit Saikia and Kandarpa Kumar Sarma, “Soft-Computation Based Speech Recognition System for Sylheti Language”, International Journal of Speech Technology, April, 2022. IF- 1.86 3.
5.	Assam Donbosco University	<p>Several workshops/ symposiums were held</p> <p>Collaborative Symposium on Recent Trends in Electronics and Communication Technology at Assam Donbosco University on 15-09-2023.</p> <p>Publication</p> <ol style="list-style-type: none"> I. Nilakshi Devi, Kandarpa Kumar Sarma and Sakuntala Laskar, “Design of an intelligent bean cultivation approach using computer vision, IoT and spatio-temporal deep learning structures”, Ecological Informatics (I. F. 5.12), vol. 75, item 102044, pp. 1-16, 2023.
6.	IIT Guwahati	Publication

		<p>I. Manash Pratim Sarma, Pranjal Barman and Kandarpa Kumar Sarma, `` An Optimized and Highly Efficient Low Power RF Energy Harvesting System with Current Boost Technique Designed using 45 nm Technology, Applied Energy, vol. 350, 2023 (I. F.- 11.2).</p> <p>II. Ananya Choudhury, Anjan Kumar Talukdar, Kandarpa Kumar Sarma and M. K. Bhuyan, "An Adaptive Thresholding Based Movement Epenthesis Detection Technique Using Hybrid Feature Set for Continuous Finger spelling Recognition", SN Computer Science, Springer Nature, vol. 2:128, pp. 1-21, 2021.</p>
7.	B Baruah Cancer Institute, Guwahati, Assam.	<p>Publication</p> <p>I. Upasanaa Bhattacharjya, Kandarpa Kumar Sarma, Jyoti Prakash Medhi, Binoy Kumar Choudhury and Geetanjali Barman, ``Automated diagnosis of COVID-19 using radiological modalities and Artificial Intelligence functionalities: A retrospective study based on chest HRCT database", in Biomedical Signal Processing and Control (Elsevier), Vol. 80, Article number 104297, February 2023. (I.F- 6.9)</p>
8.	Assam downtown University	<p>International Conference on Advances in Sustainable Development, Innovation, and Green Technology (ICAS-DIGT-2024) held between 19 and 21 February, 2024 at the Assam downtown University. The conference was organized by the Faculty of Engineering and the Directorate of Innovation, Startup and Acceleration, AdtU in association with Assam Engineering College, Guwahati, the Dept. of Electronics and Communication Engineering, Gauhati University, and NEILIT, Guwahati</p>

MoU	Its related activities
IIE & Zoology	<p>Establishment of Livelihood Business Incubator under ASPIRE scheme of MSME, GOI to trained 2000 youth & farmers in accordance with six job roles of NSQF, GOI to develop Micro enter prise, skill manpower and self employment in selected six Aquaculture interventions</p>  

GiZ and Zoology

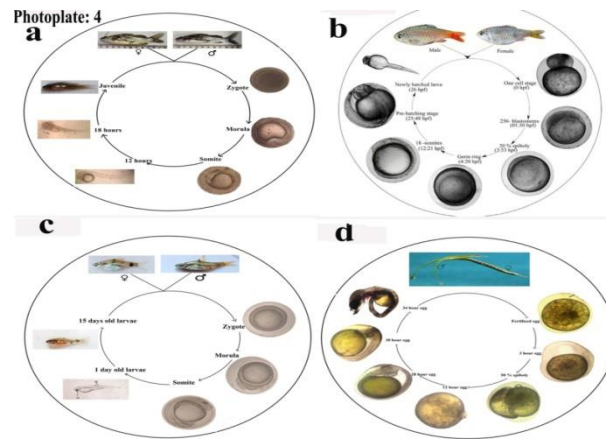
Objective of the MOA is to Study **Adaptive research on indigenous/endemic fish species of the North Eastern Region of India: inputs on threat level and opportunities for protection and management in adapting climate change** under NERAQ the project executed by the Federal Govt of Germany & Govt. of India



IFB Potsdam,
Germany and
Zoology

Activities

It has decided to study jointly the Fishery Ecology of the lentic and lotic water bodies of NE India. To revamp curricula by adding more modules in Aquaculture & Fisheries. Development of breeding and larval rearing protocols of indigenous fishes of NE India. Faculty and student exchange program etc.



WII and Zoology

It has decided to work jointly Govt of India funded project Called **Project Dolphin** especially in Assam to know habitat ecology of Fishes of River Brahmaputra which act as food for River Dolphin

