Name in capital:	DR KIRAN SUNAR	
Designations and Department	ASSISTANT PROFESSOR AND HEAD, DEPARTMENT OF BOTANY	
Qualification:	***Ph.D. (Botany), 2014*** University of North Bengal (SRF-Indian Council of Agricultural Research, ICAR, New Delhi) ***Masters in Botany, 2003 – 2005*** University of North Bengal, (University Medalist) ***Bachelor of Science, Botany, 1999 – 2003*** Sikkim Govt. College, Gangtok	
Email Id and Contact Details:	kiran.sunar@gmail.com 8373902354	

ABOUT: TEACHER BY PROFESSION AND RESEARCHER BY PASSION.

Professional Experience

- Assistant professor in Botany, Balurghat Mahila Mahavidyalaya (December 2016 to Current)
- Research Associate and in-charge in Centre For Mycorrhiza Research, The Biotechnology and Management of Bioresources Division, TERI, New Delhi since: (2014-2016)
- Senior Research Fellow, National Bureau of Agriculturally Important Microorganisms, NBAIM, ICAR , 2007- 2013.

Specific and broad area of research interest

Microbiology

- Isolation and characterization (Biochemical, Morphological and Molecular) microorganisms.
- Functional characterization of microorganisms for Agriculturally Important Properties like phosphate solubilization, chitin degradation, protein hydrolysis, IAA production, HCN production, Siderophore production, ACC Deaminase and antagonistic activities against phytopathogens.
- Preparation and application of microbe based bio-formulations of PGPR, PGPF and BCA for crop improvement in greenhouse and field trials.

- Morpho-taxonomical, Biochemical, Molecular characterization of Mycorrhizal Fungi. Developing pure culture lines and their characterization and studies related to host interactions.

Biochemistry

- Extraction, Estimation of proteins, enzymes, phytoalexins and other phytochemical compounds using TLC, HPLC Spectrophotometric, Column chromatography, PAGE and SDS PAGE analysis.
- Utilization of freeze dry techniques (Lyophilization) and sonication techniques.
- Metabolomic studies of different compounds expressed during host pathogen interactions.

Immunology

- Production and purification of polyclonal antibodies for detecting microorganisms
- Development of immunological formats for detection using techniques like DOT immuno-binding assays (DIBA), immuno-diffusions, immunofluorescence, western blotting, ELISA etc.

Molecular Biology

- Isolation of DNA (Plants and microbes).
- Polymerase chain Reactions (PCR) techniques for detection and identifications using techniques like Nested PCR etc.
- Cloning and construction of genomic libraries of functional genes.
- DNA fingerprinting and primer designing techniques for genetic diversity analysis and species identification and Phylogenetic analysis of microorganisms using relevant bioinformatics tools.

Awards/Recognitions

- University Medal for first class with Distinction in M.Sc. in Botany, 2005.
- Third best poster presentation award at National symposium on “New Biology in Agriculture” PanjabUniversity,Chandigarh from 7-8, Nov,2008.
- Prof. K.S. Bilgrami Best paper (Poster) award in 32nd Annual Conference of Indian Society of Mycology and Plant Pathology and National Symposium, Junagarh, 2010.
- Winner of Prof M.J.Narshiman Merit Academic Award Contest- 2012 (East Zone) held during the National Symposium on Plant Microbial Interactions and Crop Health Management and 25th AGM (East Zone) of Indian Phytopathological Society at Department of Plant Protection,PalliSikshaBhavana, Visva-Bharati, Sriniketan from 6-7 Oct, 2012.
- Commendation award for Prof M.J. Narshiman Merit Academic Award Contest of Indian Phytopathological Society, IARI, New Delhi- 2013.Awarded during the National Symposium on Blending conventional and modern plant pathology for sustainable agriculture” organized by IPS, New delhi, IIHR, BangLORE ND University of Agricultural Sciences, GKVK. Bangalore from 4-6th December 2012.
- Second Prize for P.P Singal Memorial Pesticides Industries Award- 2013. Indian Society of Mycology and Plant Pathology, Udaipur. Awarded in 35th Annual conference and national Symposium on “Innovative and ecofriendly research approaches for plant disease management” organized by ISMPP and Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, MS from 8-10th January, 2014.
- Prof. K.S. Bilgrami Best paper (Poster) award 2013. Indian Society of Mycology and Plant Pathology, Udaipur. Awarded in 35th Annual conference and national Symposium on “Innovative and ecofriendly research approaches for plant disease management” organized by ISMPP and Dr. Panjabrao Deshmukh KrishiVidyapeeth, Akola, MS from 8-10th January, 2014.

Current research involvement

Recent Research Areas:
Agriculture Microbiology- Mycorrhiza, PGPR, PGPF. Microbial Diversity analysis

Major Research Contributions:

- Analysis of Diversity, cataloguing and application of Agriculturally Important Microorganisms of major Forests, agricultural and river banks of Darjeeling hills of West Bengal.
- Characterization and Maintenance of Germplasm bank of Mycorrhiza in Centre for Mycorrhizal Research, TERI

Research Projects: (Contributing as PI, Co-PI and RA in the following research projects)

- Harnessing Endophytes and Arbuscular Mycorrhizal Fungi from Citrus Microbiome for Plant and Soil Health Management in North East India (DBT) Current Ongoing- PI
- Second Generation Germplasm Bank of Arbuscular Mycorrhiza Fungi and Ecto Mycorrhizal Fungi (DBT)- RA
- Mycodetect-Development of Molecular Tools for detecting Arbuscular Mycorrhiza Fungi in the environment (DBT)-CO-PI
- Sustainable livelihood activities on reclaimed open cast coal mines: a technology enabled integrated approach in Indian Coal sector - plantation component (Coal India) Co-PI

Research Collaborators: National Bureau of Agriculturally Important Microorganisms, ICAR, New Delhi, Department of Biotechnology, Govt. of India.

Student/researchers supervision experience

PhD level

1. Ms. Ruchika Rani- Characterization of AMF for plant growth promotion and nutrient mobilization. 2014

Undergraduate level

Summer/ **semester projects at** MS / **MTech**/ BTech

- Ms. Hina Arya : Characterization of Arbuscular-Mycorrhizal Fungi of Leh (Spiti Valley region) of Jammu Kashmir with special reference to FAME profiling and rDNA sequences- M.Tech. Maulana Azad National Institute of Technology, Bhopal. 2014
- Ms. Sadhana Shukla: Morphotaxonomic, fatty acid methyl esterase profiling and rDNA sequence based characterization of Arbuscular Mycorrhiza Fungi obtained from agricultural fields of Uttar Pradesh. 2016. M.Tech. ManavRachna International Universiy, Faridabad, Haryana.
- Ms. Varsha: A combined morphological, biochemical and molecular approach for characterization of Arbuscular Mycorrhiza Fungi obtained from sub Himalayan regions of Sikkim. 2016. M.Tech. ManavRachna International Universiy, Faridabad, UP.

Publications - *NATIONAL AND INTERNATIONAL JOURNALS*

- **Sunar K**, Chakraborty U and Chakraborty BN (2020). *Bacillus altitudinis* and *Bacilllus pumilus* induce resistance in *Brassica juncea* L. against *Thanatephorus cucumeris* causing Seedling Blight. ***J. Mycopathol. Res.*** 58(3): 167-179.
- **Sunar K,** Chakraborty U and Chakraborty BN (2017). Influence of Indigenous Bacilli Isolated from Darjeeling Hills on Phosphate Mobilization and Induction of resistance against sclerotial blight disease of Tea cultivars. *Int J Basic and Appl Biol 4(2)*: 128-134.

- **Sunar K,**Dey PL, Chakraborty U and Chakraborty BN **(2015).** Biocontrol efficacy and plant growth promoting activity of *Bacillus altitudinis* isolated from Darjeeling hills, India. ***J Basic Microbiol.*** 55: 91-104.
- **Sunar K**, Chakraborty U and Chakraborty BN **(2014).** Exploitation of native microflora of Darjeeling hills for sclerotial rot management and growth promotion in pulses**.** ***Indian Phytopath***67(1): 59-69.
- **Sunar K**, Chakraborty U and Chakraborty BN **(2014).**Harnessing beneficial microorganisms from Darjeeling hills and development of strategies for their utilization in management of root diseases. ***J Mycol Pl Pathol***44(1): 25-40.
- Chakraborty BN, Chakraborty U, **Sunar K** and Dey PL **(2014).**RAPD analysis of phosphate solubilizing fungi and rDNA gene sequence based phylogeny of *Talaromycesflavus*- an efficient phosphate solubilizer. ***J Mycol Pl Pathol***44(1): 62-73.
- Chakraborty BN, Chakraborty U, Dey PL and **Sunar K(2014).** Evaluation of PGPR traits of native bacterial strains from Darjeeling and analysis of their diversity. ***J Botan Soc Bengal*** 68(2) 159-176.
- Ghorui M and **Sunar K** (2014) Arbuscular Mycorrhiza Fungi- Prospects in Agriculture. Himalayan Research Journal II (1): 37-52.
- Roy S, **Sunar K,**Dey U and Chakraborty BN **(2013).** Influence of selective Bioresources on Seedling Vigour and Growth of *Cicerarietinum* L. in Field conditions. ***Advance Crop Science*** 13(10): 662-670.
- Chakraborty U,Chakraborty BN, Chakraborty AP, **Sunar K** and Dey PL **(2013).** Plant Growth Promoting Rhizobacteria Mediated Improvement of Health Status of Tea Plants. ***Indian J Biotechnol.*** 12: 20-31
- Chakraborty BN, Chakraborty U, **Sunar K** and Dey PL **(2012).** Evaluation of plant growth promoting and antifungal activities of *Talaromycesflavus* (NAIMCC-F-01948) against *Sclerotiumrolfsii*. ***Indian Phytopathol.*** 65(3): 258-263.
- Chakraborty BN, Chakraborty U, Rai K, **Sunar K** and Dey PL **(2012).** Serological and Molecular detection of *Macrophominaphaseolina*casuing root rot of *Citrus reticulata*.***NBU J Plant Sciences*** 6(1): 77-86.
- Chakraborty BN, Chakraborty U, Saha A, Dey PL and **Sunar K(2011)**Morphological and Molecular Characterization of *Trichoderma*Isolates of North Bengal.***Journal of Mycology and Plant Pathology***, 41(2): 207-214.
- Chakraborty, B.N., Chakraborty, U., **Sunar, K.** and Dey, P.L. **(2011)** RAPD profile and rDNA sequence analysis of *Talaromycesflavus* and *Trichoderma* species. ***Indian J Biotechnology***10:487-495
- Chakraborty BN, Chakraborty U, Dey PL and **Sunar K(2010)** Phylogenetic relationship of *Trichoderma* isolates of North Bengal based on sequence analysis of ITS region of rDNA***J Appl Science and Research***6(10):1477-1482.
- Chakraborty BN, Chakraborty U, Saha A, Dey PL and **Sunar K.(2010)** Molecular characterization of *Trichodermaviride* and *Trichodermaharzianum* isolated from soils of North Bengal based on rDNA markers and analysis of their PCR-RAPD profiles. ***Global Journal of Biochemistry and Biotechnology***5 (1): 55-61.

- Chakraborty BN Chakraborty U, Saha A, Dey PL and **Sunar K. (2010)** Evaluation of phosphate solubilizer from soil of North Bengal and their diversity analysis. ***World journal of Agricultural Science*** 6 (2): 195-200
- Chakraborty BN and **Sunar K(2009)** Arbuscular Mycorrhizal fungal association in rhizosphere of *Heveabrasiliensis*. ***NBU J Plant Sciencies*** (3): 67-70.
- Chakraborty BN, Chakraborty U, Saha A, Dey PL. and **Sunar K.(2008)** Screening of phosphate solubilizing Aspergilli isolates from soils of North Bengal and their effects on soybean ***J Mycol Plant Pathol*** 38(2): 227-233.
- Chakraborty BN, Chakraborty U, Saha A, Dey PL and **Sunar K.(2008)** Searching for phosphate solubilizing fungal isolates from soil. ***NBU J Plant Sciences***2: 30-38.

CHAPTERS IN BOOK

- Chakraborty BN, Chakraborty U, and **Sunar K (2020).** Induced Immunity Developed by *Trichoderma* Species in Plants. In. A. K. Sharma, P. Sharma (eds.), *Trichoderma*, Rhizosphere Biology, Springer Nature Singapore Pte Ltd. 2020, pp- 125-147. https://doi.org/10.1007/978-981-15-3321-1_7.
- **Sunar K,** Deshmukh SK and Kumar U (2016). Recent Applications of Enzymes in Personal Care Products. In: Agro Industrial Wastes as Feedstock for Enzyme Production, (eds). GS Dhillon and S Kaur, ELSIVER, Academic Press, 278-298
- **Sunar K,** Dey PL, Chakraborty U and Chakraborty BN (2012).Evaluation of *Talaromycesflavus* for phosphate solubilization and biocontrol activity and its molecular analysis. In: *Microbial Resources for crop improvement* (eds. BN Chakraborty and U Chakraborty). Satish Serial Publishing House, Delhi, pp.129-144.
- Chakraborty U, Chakraborty BN, Chakraborty A, **Sunar K** and Dey PL (2014). Plant Growth Promoting Rhizobacteria: Diversity Mechanisms of Action and Prespectives in Agriculture. In: Annual Review of Plant Pathology Vol 6. (eds. B.N. Chakraborty and U. Chakraborty) Scientific Publishers, India, Jodhpur. pp 215-268
- Chakraborty BN, Chakraborty U, **Sunar K** and Dey PL (2014). Harnessing Beneficial Microbial Resources for Crop Improvement. In : Trends in Soil Microbial Ecology (ed. D.P. Singh and HB Singh) Stadium Press, LLC

PROCEEDING VOLUMES

- Chakraborty BN, Chakraborty U, Dey PL and **Sunar K.** (2015). Molecular Phylogenetic Analysis of *Talaromycesflavus*-a phosphate solubilizing fungus. In: Molecular and Biotechnological approaches to resource utilization-Microbes to angiosperms. (eds.Samit Ray and Sukanta K Sen), Viswabhzrzti, West Bengal. pp. 21-28.
- Chakraborty BN, Chakraborty U, Dey PL and **Sunar K.** (2012). Exploitation of agriculturally important microorganisms from soil and their evaluation for improvement of crop health status. In: Biodiversity Conservation: Fundamental and Applications (eds. H Saha, ML Ghosh, G Gangopadhyay, D Saha, PK Singh, S Sarkar and SC Das) Sarat Book Distributors, Kolkata, pp. 41-56.

NEWS LETTERS

- **Sunar K,** AhujaP, Pandit A and Adholeya A **(2016)** Morphotaxonomy of *Paraglomus majewskii* (accession–CMCC/AM–1701). Mycorrhiza News 28 (1): 19-23.
- **Sunar K,** AhujaP and Adholeya A **(2015)** Morphotaxonomy of *Glomus hoi* (accession–CMCC/AM–1301). Mycorrhiza News 27 (4): 13-17.
- **Sunar K,** AhujaP, Ghorui M and Adholeya A **(2015)** Morphotaxonomy of *Funneliformis coronatum/ Glomus coronatum* (accession–CMCC/AM–1504). Mycorrhiza News 27 (3): 18-24.
- **Sunar K,** Ghorui M and Adholeya A **(2015)** Morphotaxonomy of *Diversispora spurca* (accession–CMCC/AM–1806). Mycorrhiza News 27 (2): 15-19.
- **Sunar K,** Ghorui M and Adholeya A **(2015).** Morphotaxonomy of *Claroideoglomus etunicatum* (accession–CMCC/AM–1206). Mycorrhiza News 27 (1): 13-16.
- **Sunar K,** Ghorui M and Adholeya A **(2015).** Morphotaxonomy of *Acaulosporakentinensis* (accession–CMCC/AM–2502). Mycorrhiza News 26 (4): 13-16.
- **Sunar K,** Ghorui M, Rani, R and Adholeya A **(2014).** Morphotaxonomy of *Rhizophagus irregularis* (accession CMCC/AM-1102). Mycorrhiza News 26 (3): 10-13.

SEMINAR/CONFERENCE ATTENDED

- National Symposium on "Emerging plant diseases, their diagnosis and management" Department of Botany, University of North Bengal and Indian Phytopathological Society, from Jan 31 to Feb 2, 2006.
- 2nd Asian congress of Mycology and Plant Pathology" organised by Department of Botany, Osmania University, Hyderabad and Indian Society of Mycology and Plant Pathology, from December 19-22-2007.
- National Symposium on "Diversity and Functionality of Plant and Microbes" organized by Department of Botany, North Bengal University, from January 25-25, 2008.
- National symposium on "New Biology in Agriculture" organized by Panjab University,Chandigarh in collaboration with All India Biotech Association, from November 7 - 8, 2008.
- Siler Jublee National Symposium on "Sustainable Utilization of Plant and Microbial Resources organized by DRS Dept of Botany, University of North Bengal from February 28 to March 1, 2009.
- 31st Annual Conference and Symposium on Microbial Wealth Plant Health, organized by DRS Dept of Botany, University of North Bengal and Indian Society of Mycology and Plant Pathology from October 23 – 25, 2009.
- National Seminar on Diversity Conservation and Sustainable utilization of Plants and Traditional Knowledge in Eastern Himalaya, Organized by Department of Botany, University of North Bengal, from 14 to 16 December, 2010.
- International Conference on Genomic Sciences, VII Convention of Biotech Research Society, India and Indo-Italian Workshop on Pharmaceutical Biotechnology organized by School of Biological Sciences, Madurai Kamraj University , Madurai, from November 12 to 14, 2010.
- National Symposium on Advances in Abiotic and Biotic Stress Management of Plants and East Zone Meet of Indian Society of Mycology and Plant Pathology, Organized by DRS- Dept of Botany, University of North Bengal, from September 23 to 24, 2011.
- 3rd Global Conference , Plant Pathology For Food Security, organized by Rajasthan College of Agriculture, MPUAT, Udaipur and Indian Society of Mycology and Plant Pathology, from January 10 – 13, 2012.

- National Conference on Biology and Bioinformatics of Economically Important Plants and Microbes organized by Department of Botany and Bioinformatics facility, University of North Bengal from January 17-19, 2012.
- National Symposium on Plant Microbial Interractions and Crop Health Management and 25th AGM(East Zone) of Indian Phytopathological Society at Department of Plant Protection,PalliSikshaBhavana, Visva-Bharati, Sriniketan from 6-7 Oct, 2012.
- National Symposium on "Blending conventional and modern plant pathology for sustainable agriculture" organized by IPS, New Delhi, IIHR, Banglore and University of Agricultural Sciences, GKVK. Bangalore from 4-6th December 2012.
- National Conference on New frontiers in Medicinal Plant Research and special meeting on medicinal plants for livelihood security and community empowerment in Eastern Himalayas organized by Sikkim University, Gangtok, Sikkim from 3-5 October, 2013.
- 35th Annual conference and National Symposium on "Innovative and ecofriendly research approaches for plant disease management" organized by ISMPP and Dr. Panjabrao Deshmukh KrishiVidyapeeth, Akola, MS from 8-10th January, 2014.
- Deakin India Research Initiative, International Symposium on Translational research 2015, organized by Dekin University Australia and The Energy and Resources Institute, New Delhi, India from 6-9 December 2015.
- International Seminar AGROTECH-2017, organised by HSSFAR, Kalimpong in association with Krishi Sanskriti, New Delhi on 11th-12th May, 2017. Oral Presentation: Influence of Indigenous Bacilli Isolated from Darjeeling Hills on Phosphate Mobilization and Induction of resistance against sclerotial blight disease of Tea cultivars. At Kalimpong Science Centre, Kalimpong West Bengal, India.
- National Seminar on Recent Trends in Life Sciences organized by Department of Zoology, Riganj Universty, Raiganj, Uttar Dinajpur, WB on 26th March 2017.
- International Seminar on Current Trends on Current Avenues in Microbial and Plant Sciences - 2019. Organized by Department of Botany, University of Gour Banga, Mokdumpur, Malda, West Bengal. From 23-25, February, 2019.
- International Symposium on "Nature, Microbes and Society" being organized by the Indian Mycological Society, February 6-8, 2020.

External funding used so far:

- National Bureau of Agriculturally Important Microorganisms (NBAIM) Indian Council of Agricultural Research, New Delhi)- In a mega network project " Application of Microorganisms in Agriculture and Allied sectors" under the theme "Microbial Diversity".
- Implementing agency: NBAIM and University of North Bengal, Darjeeling, West Bengal (Duration 7 years- 2007- 2014)
- Department of Biotechnology, Govt. of India for Research Project "Second Generation Germplasm Bank of Arbuscular Mycorrhiza Fungi and Ecto Mycorrhizal Fungi" Implementing agency: The Energy and Resources Institute, New Delhi (Duration 3 years- 2014-2016)

Training program attended for skill development:

- Workshop on "Implementation of Under Graduate Syllabus" organised by Department of Botany,University of Gour Banga, Malda West Bengal from 13th to 19th November, 2017.
- User Awareness programme on Access to E- Resources under N-List Programme, organized by University Library, University of North Bengal and INFLIBNET Centre, Ahmedabad held on February 10, 2012.
- UGC sponsored research scholars' training programme, organized by University Grants Commission, Academic Staff College, University of North Bengal from June 30 – July 7, 2011.

- Indo-Italian Workshop on “Industrial and Pharmaceutical Biotechnology” organized by School of Biological Sciences, Madurai Kamraj University, Madurai. from12-14 Nov, 2010.
- National Workshop on “Bioinformatics” organized by Bioinformatics Facility, Department of Botany, North Bengal Universityfrom March7-9, 2008.
- National Training Programme on Microbial Chemical Taxonomy: Polyphasic approach, organized by National Bureau of Agriculturally Important Microorganisms (NBAIM), ICAR from September 20th to 29th, 2008.
- National Training Programme on Microbial Community Analysis through Metagenomics, organized by National Bureau of Agriculturally Important Microorganisms (NBAIM), ICAR from February 3-7, 2007.
- Training Work Shop on Cultivation of Medicinal Plants organized by Dept. of Adult Continuing Education, extension & field outreach and Department of Botany, University of North Bengal from March 25-26, 2006.

PROFESSIONAL MEMBERSHIPS

Life Member

Indian Society of Mycology and Plant Pathology (ISMPP), Udaipur

Asian PGPR Society (APS)

Association of Microbiologists of India (AMI)

Group Member

American Phytopathological Society (APS), USA

Annual Member

Indian Phyto-Pathological Society, IARI, New Delhi

(Dr Kiran Sunar)

Dept. of Botany, Balurghat Mahila Mahavidyalaya

Date: 30/03/2021