



"সমানো মন্তে সমিতি: সমানী"

UNIVERSITY OF NORTH BENGAL

Accredited by NAAC with grade A



DR. DIPANWITA SAHA

Name of the faculty member: Dr. Dipanwita Saha.

Designation: Professor.

Contact information: Department of Biotechnology, University of North Bengal, Raja Rammohanpur, Darjeeling, West Bengal. – 734013. **E-mail:** dsahanbu@yahoo.com, dipanwitasaha@nbu.ac.in

Contact number: +91 9434429800

Subject specialization: Plant Biotechnology, Biochemistry, Microbiology

Education/Academic qualifications:

Examination (Year of Passing)	Institution of study
B.Sc. in CHEMISTRY (Hons.) (1989)	Jogomaya Devi College, University of Calcutta, Kolkata
M.Sc. in BIOCHEMISTRY (1991)	Ballygunj Science College, University of Calcutta, Kolkata
Ph.D. in Science (2000)	North Bengal University
Qualified in Graduate Aptitude Test in Engineering (GATE)-1992	
Qualified in State Level Eligibility Test (SLET) – 1999	

Training courses attended:

1. “**PCR** in Medical and Biophysical Sciences and its application” in diagnostics at Department of Biophysics and Molecular Biology, Calcutta University, 2001
2. “Bio-informatics and its application” at IIT Kharagpur, 2002

Positions held/holding :

1. Junior Research Fellow, IICB, Kolkata (1993).
2. Junior and Senior Research Fellow, Centre for Life Sciences (Zoology), University of North Bengal (1994-98).
3. Post Doctoral Research Associate (CSIR), Department of Botany, University of North Bengal (2000-2004).
4. Lecturer, Department of Biotechnology, University of North Bengal (September 2004 - September 2008).
5. Senior Lecturer, Department of Biotechnology, University of North Bengal (September 2008 - September 2013).
6. Assistant Professor (Stage 3), Department of Biotechnology, University of North Bengal. (September 2013- September 2016)
7. Associate Professor, Department of Biotechnology, University of North Bengal. (September 2016- Sep 2019)
8. Professor, Department of Biotechnology, University of North Bengal. (September 2019-..)

Areas of Research Interest:

- ◆ Phytochemistry of medicinal plants, purification of natural antifungal compounds, natural antioxidants.
- ◆ Genetic determinants of virulent factors and antibiotic resistance in bacterial pathogens and their mobility in the aquatic environment.
- ◆ Occurrence and distribution of viral and fungal pathogens in plants.
- ◆ Role of siderophore and antibiotics in biocontrol of plant pathogens.
- ◆ *Aeromonas* spp. as an emerging opportunistic pathogen in sub-Himalayan West Bengal.

Areas of Teaching:

- ◆ Biochemistry, Genetics, Genomics and Proteomics, Virology, Environmental Biotechnology
- ◆ Guiding students for research during M.Sc. dissertation project.

Research Guidance:

- Number of research students awarded Ph.D. degree: **14 (Fourteen)**
- Number of research students pursuing Ph.D. degree: **04 (Four)**

PhD Awardees:

Name of the Ph.D. student with current position	Thesis Title
Dr. Akan Das Post Doctoral Fellow Faculty of Biology Jagiellonian University Gronostajowa 7, 30-387 Krakow, Poland	Generation and characterization of expressed sequence tags of tea (<i>Camellia sinensis</i>)
Dr. Anasooya Ghosh Post Doctoral Fellow Oregon, USA	Studies on soil-inhabiting siderophore producing bacteria and their role in suppression of plant root pathogens
Dr. Arindam Das Assistant Professor	Studies on R-plasmids in bacteria isolated from Epizootic Ulcerative Syndrome (EUS) affected fishes

Burdwan Raj College West Bengal	
Dr. Arnab Saha, District Microbiologist Department of Health and Family Welfare, Government of West Bengal	Studies on some leaf and fruit diseases of <i>Lagenaria siceraria</i> (Molina) Standl. and their management
Dr. Bhusan Gurung Post Doctoral Research Associate Biotechnology Division, SSCST, Sikkim	Cloning and Characterization of genes involved in biosynthesis of ginsenosides from <i>Panax sokpayensis</i> Shiva K. Sharma & Pandit
Dr. Bikram Kumar Saha Assistant Professor St. Xaviers' College	Studies on some viral diseases of economically important crops from sub-Himalayan West Bengal and their management strategies
Dr. Gargee Dhar Purkayastha Assistant Teacher, Sri Sri Academy, Siliguri, West Bengal	Biological control of important fungal pathogens of tea by antagonistic microorganisms isolated from tea rhizosphere
Dr. Harikamal Barman Assistant Teacher, Siliguri, West Bengal	Screening, extraction and application of botanical fungicides against important fungal pathogens of some economically important crops of North Bengal
Dr. Lopamudra Das Assistant Teacher, Midnapur	Studies on tea seed mycoflora and resistance of young tea plants against <i>Rhizoctonia solani</i> , a soil borne root pathogen of germinating tea seedlings
Dr. Prasanta Kumar Bera Assistant Director Animal resource Development Department, Government of West Bengal	Phenotypic and Molecular Characterization of Siri cattle breed from Eastern Sub-Himalayan Region
Dr. Ramashish Kumar Scientific Officer ICAR National Research centre on Lichi, Muzaffarpur, Bihar	Characterization and application of some plant extracts for controlling important foliar fungal pathogens of tea
Dr. Prosenjit Chakraborty Post Doctoral Research Fellow Advanced Centre for Plant Virology, IARI, New Delhi	Molecular detection, diversity analysis and management of some RNA viruses infecting crops in north-east Indian plains
Dr. Shibu Das Assistant Professor, Rammohan College, Kolkata	Analysis of specific transcripts following induction of defense in tea against foliar fungal pathogens
Dr. Sima Mandal Assistant Professor Raniganj Women's College Raniganj, West Bengal	Studies on copper toxicity on cultivated varieties of tea of north east India

Current students:

Name of the Ph.D. student with current position	Thesis Title
Smriti Pradhan (NET-CSIR SRF)	Studies on siderophore producing and arsenic resistant bacteria isolated from agricultural soil and their role in biocontrol and bioremediation
Niloy Roy (NET-UGC JRF)	Studies on fungal pathogens infecting <i>Citrus</i> sp. In sub-Himalayan West Bengal

Dipanwita Ghosh, Asst. Prof., Siliguri College	Studies on diversity and virulence properties of haemolytic bacteria from aquatic sources and phylogenetic analysis of hemolysins
Piyali Sarkar, Technical Officer, FCI, Jalpaiguri	Studies on diversity and distribution of potyviruses infecting cultivated crops of sub-Himalayan West Bengal and their management strategies

Achievement & Awards:

- ◆ Presented the **Key note address** and one **invited lecture** in “International Conference on Food & Nutrition” in **Vancouver, Canada** during July 25-26, 2018.
- ◆ Presented research paper in “International Congress of Plant Pathology” in **Boston, USA** during 29 July to 3rd August, 2018.
- ◆ Best poster presentation award in the 6th International Conference “Plant, Pathogens and People”, Feb. 23-27, 2016, NASC Complex, New Delhi, India.
- ◆ Prof. K.S. Bilgrami award for best poster presentation 2009 : 31st Annual Conference of ISMPP and Symposium on Microbial Wealth-Plant Health, October 23-25, 2009 University of North Bengal.
- ◆ Best poster presentation award: at 32nd Annual conference of Indian Society of Mycology and Plant Pathology, 2010 held at Junagarh Agricultural University, Junagarh, Gujarat during 24th - 27th November, 2010.
- ◆ DST international travel grant award for presenting paper at the 9th International Plant Molecular Biology Congress, 2009 at **St. Louis, University of Missouri, USA** during October 25-30, 2009.
- ◆ Best poster presentation award: at National Conference on Medicinal and Aromatic plants organized by Gulbarga University, Karnataka, 2007.
- ◆ Presented **invited lecture** in International conference on Integration of Science and Technology for Sustainable Development, in **Bangkok, Thailand** during 26-27 April, 2007.
- ◆ International travel grant award from DST and DBT for presenting paper at the XVth Congress of the Federation of European societies of Plant Biology during July 17-21, 2006, in **Lyon, France**.
- ◆ Recipient of CSIR Research Associateship for Post Doctoral research for five years (2000-2004)

Member of Learned Societies: Life Member of Indian Phytopathological Society

Projects undertaken:

S. No.	Title	Agency	Period	Grant/Amount Mobilized (in Rs)
1.	Alleviation of biotic stress in tea mediated by rhizosphere competent microorganisms	UGC (minor research project, NBU)	1-4-2022 to 31-3-2023	1,50,000/=
2.	Studies on siderophore producing and arsenic resistant bacteria isolated from agricultural soil and their role in biocontrol and bioremediation	CSIR-Research fellowship	24-1-2018 to 23-1-23	20,00,000/=
3.	Characterization of arsenic-resistant bacteria and their possible application in bioremediation	UGC (minor research project, NBU)	1-4-2018 to 31-3-2020	1,50,000/=
4.	Studies on occurrence and distribution of antibiotic resistance and virulence genes among <i>Aeromonas</i> species in sub-Himalayan West Bengal and their	UGC (major research project)	2-7-2014 to 31-3-2017	15,50,000/=

	conjugal spread in other bacteria.			
5.	Diversity analysis of <i>Exobasidium</i> spp. causing blister blight disease in tea grown in the Darjeeling hills using PCR assays.	UGC (minor research project, NBU)	1-4-2015 to 31-3-2017	75,000/=
6.	Studies on role of antifungal metabolites produced by biocontrol bacteria in suppression of fungal pathogens of tea	CSIR-Senior Research Fellowship	1-04-13 to 31-3-2015	5,00,000/=
7.	Developing specific biological control strategies for obtaining long lasting, economical and eco-friendly measures for controlling major fungal diseases of some widely cultivated horticultural crops of West Bengal	DBT, Govt. of West Bengal major research project)	1-4-09 to 31-3-2011.	5,52,000/=
8.	Studies on copper toxicity on cultivated varieties of tea of North East India	Rajiv Gandhi National Fellowship	1-04-08 to 31-3-2013	8,73,500/=
9.	Screening and characterization of antifungal phytochemical component from plant extracts against some fungal pathogens	ICMR (JRF ship)	28-1-09 to 27-1-2014	11,32,000/=
10.	Characterization and application of botanicals for controlling important foliar fungal diseases of tea	CSIR research scheme	27-11-06 to 31-5-2010	10,00,000/= (approximately)
11.	Screening characterization and application of microbial antagonists for control of major diseases of tea	UGC (major research project)	1-4-07 to 31-3-2010	7,75,000/=

Publications:

1. Mangar, P., Barman P, Kumar A, Saha A and **Saha D.** 2022. Detection of virulence associated genes and *in vitro* gene transfer from *Aeromonas* sp. isolated from aquatic environments of sub-Himalayan West Bengal. *Frontiers in Veterinary Sciences* (In press).
2. Mudi P.K., Pradhan S., Sahu A., **Saha D.**, Biswas B. 2021. Synthesis, X-ray structure and evaluation of bactericidal activity of an o-vanillin functionalised schiff's base. *Applied Microbiology: Theory and Technology* **2**:18-27.
3. *Karmakar A., Sarkar, T., Chakraborty P., Biswas K.K., Saha A. Saha D.* 2021. Genetic variability of Tomato leaf curl New Delhi virus infecting cucumber in sub-Himalayan plains in eastern India. *International Journal of Agricultural Technology* **17**:535-544.
4. Chakraborty P., Karmakar, A., Sarkar, T., Saha A. **Saha D.** 2019. First report of *Lagenaria* mild mosaic virus infecting bottle gourd in India. *Plant Disease*, DOI: 10.1094/PDIS-01-19-0195-PDN
5. Sarkar, T. P. Chakraborty, A. Karmakar, A. Saha and **D. Saha.** 2019. First report of *Pericononia macrospinosa* causing leaf necrosis of pointed gourd in India. *Journal of Plant Pathology* **101**: 1281.

6. Gurung B., Bains S., **Saha D.**, Singh K., Bhardwaj P.K., D. Sahoo. 2019. Molecular cloning and characterization of farnesyl pyrophosphate synthase gene from *Panax sokpayensis*, a new *Panax* species from Sikkim Himalayas. *Journal of Applied Research on Medicinal and Aromatic Plants* **14**: 100215
7. **Saha, D.**, Chakraborty, A., Kumar, R., Raychaudhury, B. 2019. *In vitro* antifungal activity of plant extracts against pathogens of clinical and agricultural importance and phytochemical analysis of the active compounds. *Environment and Ecology* **37**: 263-269.
8. Dhar Purkayastha G, Mangar P, Saha A, **Saha D.** 2018. Evaluation of the biocontrol efficacy of a *Serratia marcescens* strain indigenous to tea rhizosphere for the management of root rot disease in tea. *PLoS ONE* **13**: e0191761.
9. Sarkar, T. P. Chakraborty, A. Karmakar, A. Saha and **D. Saha.** 2018. *Curvularia* leaf spot of pointed gourd in India. *Canadian Journal of Plant Pathology* **40**: 594-600.
10. Sarkar, T., Karmakar, A., Saha, A., Saha, A. and **Saha, D.** 2018. *In vitro* bio-control of *Fusarium equiseti* infecting *Trichosanthes dioica* from sub-Himalayan, West Bengal. *Annals of Plant Protection Sciences* **26**: 222-225.
11. Sarkar, T. P. Chakraborty, A. Karmakar, A. Saha and **D. Saha.** 2018. First Report of *Ascochyta medicaginicola* Causing Leaf Blight Disease of Pointed Gourd in India. *Plant Disease* **102**: 2657.
12. Gurung, B., **Saha, D.**, Bhardwaj, P. K., Sahoo, D. 2018. Cloning and *in silico* characterization of Phosphomevalonate kinase gene from *Panax sokpayensis* Shiva K Sharma & Pandit. *Environment and Ecology*. **36**: 1125-1132.
13. Mandal H., Chakraborty P., Das S., Saha A., Sarkar T., **Saha D.** and Saha A 2017. Biocontrol of virulent *Ralstonia solanacearum* isolates by an indigenous *Bacillus cereus*. *Journal of Agricultural Technology* **13**: 19-30
14. Chakraborty P., Das S., B. Saha, A. Karmakar,, **Saha D.**, Saha A. 2017. Rose rosette virus: An emerging pathogen of garden roses in India. *Australasian Plant Pathology*, **46**; 223-226.
15. Das, S., Chakraborty, P., Mandal, P., **Saha, D.** and Saha, A. 2017. Phenylalanine ammonia-lyase gene induction with benzothiadiazole elevates defence against *Lasiodiplodia theobromae* in tea in India. *Journal of Phytopathology* **165**: 755-761
16. Chakraborty P., Das S., Saha A, **Saha D.** and Saha A. 2016. First report of Soybean Mosaic Virus infecting bottle gourd plant in India. *Plant Disease*, **100**: 1509.
17. Bera, P.K., **Saha, D.**, Ghosh, S.K. and Das, S. 2016. Phenotypic characterization of different colour variants of endangered siri cattle in West Bengal and Sikkim. *Indian J. Anim. Health.* **55**: 149-156.
18. Kumar, R., Saha A. and **Saha D.** 2016. Biotransformation of 16-oxacleroda-3,13(14)E-dien-15-oic acid isolated from *Polyalthia longifolia* by *Rhizopus stolonifer* increases its antifungal activity. *Biocatalysis and Biotransformation* **34**: 212-218.
19. Saha Arnab, Das S., Chakraborty P., Saha B., **Saha D.** and Saha A. 2016. Two new bottle gourd fruit rot causing pathogens from Sub-Himalayan West Bengal. *Journal of Agricultural technology*, **12**: 337-348.
20. A Das, M. Mukhopadhyay, B. Sarkar, **D. Saha**, T. Mandal. 2015. Influence of drought stress on cellular ultrastructure and antioxidant systems in tea cultivars with different drought sensitivities. *J Environmental Biology* **36**: 875-882.
21. Chakraborty P., Das S., Saha B., Sarkar P, Karmakar A, Saha Arnab, **Saha D.** and Saha A. 2015. Phylogeny and synonymous codon usage pattern of Papaya ringspot virus coat protein gene in sub-Himalayan region of north-east India. *Canadian Journal of Microbiology*, **61**(8): 555-564.
22. Saha A., Saha B., Das S., Chakraborty P. Sarkar P. and **Saha D.** 2014. Molecular detection and diversity analysis of some potyviruses associated with mosaic diseases of papaya, common bean and potato growing in sub-himalayan west Bengal. *Vegetos* **27**(2): 338-346.

23. Saha A., Saha B., and **Saha D.** 2014. Molecular detection and partial characterization of a begomovirus causing leaf curl disease of potato in sub-Himalayan West Bengal, India. *Journal of Environmental Biology* 35(3): 601-606.
24. Saha A., Das L., Saha B., and **Saha D.** 2014. Effect of nutritional and physiological features on *Rhizoctonia solani*, a seed borne pathogen of tea. *Journal of Plant Disease Sciences* 9(1): 48-54.
25. Saha B., **Saha D.**, Biswas K.K. and Saha A. 2014. Distribution and molecular characterization of begomoviruses infecting tomato in sub-Himalayan Terai region of West Bengal and Brahmaputra valley of Assam in northeast India. *Indian Phytopathology* 67(1): 92-96.
26. Das, A., **Saha, D.** and Mandal T.K. 2013. An Optimized Method for Extraction of RNA from Tea Roots for Functional Genomics Analysis. *Indian Journal of Biotechnology* 12:129-132.
27. Saha A., Saha B., Chakraborty P. and **Saha D.** 2013. Identification of begomovirus-infected mosaic diseases from uncultivated crops of sub-Himalayan plains of East India. *Journal of Agricultural Technology* 9(5): 1241-1252.
28. Saha B., **Saha D.** and Saha A. 2013. Begomovirus causing leaf curl disease in tomato (*Lycopersicon esculentum*) in sub-Himalayan West Bengal, India. *NBU Journal of Plant Science* 7:35-41.
29. Saha A., Mandal H. and **Saha D.** 2013. Isolation and identification of a virulent *Ralstonia solanacearum* by *fliC* gene amplification and induction of chitinase by 2-amino butyric acid for control of bacterial wilt in tomato plants. *NBU Journal of Plant Science* 7:95-100.
30. Mandal S., Saha A. and **Saha D.** 2013. Effect of copper on seed germination, root elongation and shoot elongation of seedlings of commercially cultivated tea varieties. *NBU Journal of Plant Science* 7:43-49.
31. **Saha, D.**, Kumar, R., Ghosh, S., Kumari, M., Saha, A. 2012. Control of foliar diseases of tea with *Xanthium strumarium* leaf extract. *Industrial Crops and Products*. 37: 376-382.
32. Kumar, R., Saha A. and **Saha D.** 2012. A new antifungal coumarin from *Clausena excavata*. *Fitoterapia*, 83: 230–233.
33. **Saha D.**, Purkayastha, G.D., Ghosh A., Isha, and Saha, A. 2012. Isolation and characterization of two new *Bacillus subtilis* strains from rhizosphere of eggplant as potential biocontrol agents. *Journal of Plant Pathology* 94:109-118.
34. Mandal S., Saha A. and **Saha D.** 2012. Copper induced oxidative stress in tea (*Camellia sinensis*) leaves. *Journal of Environmental Biology* 33: 861-866.
35. Saha A., Isha, M., Dasgupta, S. and **Saha, D.** 2010. Pathogenicity of *Colletotrichum gloeosporioides* (Penz.) Sacc. Causal agent of anthracnose in different varieties of eggplant (*Solanum melongena* L.) determined by levels of cross-reactive antigens shared by host and pathogen. *Archives of Phytopathology and Plant Protection*. 43: 1781–1795.
36. Das, A., Bagchi, S., **Saha, D.** and Pal, J. 2010. Virulence Potentials and Plasmid Profiles in *Aeromonas* Bacteria Isolated from EUS Affected Fish. *Environment and Ecology* 28: 1607-1610.
37. Purkayastha, G.D., A. Saha and **D. Saha**. 2010. Characterization of Antagonistic Bacteria Isolated from Tea Rhizosphere in Sub-Himalayan West Bengal as Potential Biocontrol Agents in Tea. *J Mycology Plant Pathol* 40: 27-37.
38. Saha, A., Saha, B and **Saha, D.** 2010. Major plant viruses: an overview. *NBU Journal of Plant Sciences* 4 :5-10.
39. Das, A., **Saha, D.** and Pal, J. 2009. Antimicrobial resistance and in vitro gene transfer in bacteria isolated from the ulcers of EUS affected fish in India. *Letters in Applied Microbiology* 49: 497-502.
40. Saha A., Isha, M., Dasgupta, S. and **Saha, D.** 2009. Influence of culture media and environmental factors on growth and sporulation of *Colletotrichum gloeosporioides* (Penz.) Sacc. causing anthracnose of brinjal (*Solanum melongena* L.) *Environment and Ecology* 27: 872-879

41. Saha, A., Mandal, P., Dasgupta, S. and Saha D. 2008. Influence of culture media and environmental factors on mycelial growth and sporulation of *Lasiodiplodia theobromae* (Pat.) Griffon & Maubl. *J. Environmental Biology*, 29: 407-410.
42. Saha, D., Dharpurkayastha, G., Saha, A. 2008. Degradation of mancozeb and thiophanate-methyl by bacteria isolated from tea-garden soil. *Environment and Ecology* 26: 2231-2235
43. Saha, A., Dasgupta, S., Mandal, P. and Saha D. 2008. Influence of culture media and environmental factors on mycelial growth and spore germination behaviour of *Curvularia eragrostidis* *NBU Journal of Plant Sciences* 2: 77-85.
44. Dasgupta, S., D. Saha and A. Saha. 2007. Yield response of *Pleurotus sajarcaju* in different substrates. *Geobios* 34 : 165-168.
45. Saha A., Dasgupta, S. and D. Saha 2007. Immunotechniques: concept and application in plant pathology. *NBU Journal of Plant Sciences* 1:45-59
46. Dasgupta, S., Saha, D. and Saha, A. 2005. Levels of Common Antigens in Determining Pathogenicity of *Curvularia eragrostidis* in Different Tea Varieties. *Journal of Applied Microbiology*, 98:1084-1092.
47. Saha, D., Dasgupta, S. and Saha, A. 2005. Antifungal activity of some plant extracts against important fungal pathogens of tea (*Camellia sinensis*) *Pharmaceutical Biology* 43(1):87-91.
48. Saha, D., Dasgupta, S. and Saha, A. 2005. Control of foliar tea diseases by leaf extracts of *Polyalthia longifolia*. *Journal of Mycology and Plant Pathology*. 35(1): 132-136
49. Saha, D. and Pal, J. 2002. *In vitro* antibiotic susceptibility of bacteria isolated from EUS affected fishes in India. *Letters in Applied Microbiology*, 34 : 311-316.
50. Saha D. and Pal, J. 2002. Susceptibility of *Heteropneustes fossilis* to three fish pathogenic bacteria isolated from fishes with epizootic ulcerative syndrome. *Environment and Ecology*, 20 (4): 822-825.
51. Saha, A.; Dasgupta, S. and Saha, D. 2001. Discovery of *Curvularia eragrostidis* on tea (*Camellia sinensis* (L.) O. Kuntze) leaves from clonal-cutting nurseries in North Bengal. *Environment and Ecology*, 19 (4): 846-848.
52. Saha D. and J. Pal. 2000. Bacterial studies on fishes affected with epizootic ulcerative syndrome. *Asian Fisheries Science*. 13: 343-355.

Book Chapters:

1. **Dipanwita Saha**, Shibu Das, Prosenjit Chakraborty, and Aniruddha Saha. 2018. Nutrient Availability and Plant-Microbe Interactions in Phytoremediation of Metalliferous Soils. *In Phytoremediation of Environmental Pollutants*. (Eds. Chandra, R., Dubey, N., Kumar, V.). Pp 210-226, Boca Raton: CRC Press.
2. **Saha D**, Dhar Purkayastha G. and Saha A. 2012. Biological control of plant diseases by *Serratia* species: a review or a case study. *In: Frontiers on Recent Developments in Plant Science*. (eds. Priti Maheswari and Akash Goyal), Bentham e-Books. Vol 1 pp. 99-115.
3. Saha A., Saha B. and Saha D. (2012) Important begomoviruses of some economically important horticultural crops and associated crops of sub-Himalayan West Bengal and Brahmaputra valley of Assam. *In Biology of Plants and Microbes* Ed. S. Roy & D. Bose. Sarat Impression Limited, Kolkata. Levant Books, Kolkata. ISBN 978-93-80663-63-0
4. Ghosh A., Saha A. and **Saha D**. (2013) Dominant rhizosphere bacteria as source of antifungal agents and PGPR. *In "Microbial Resources for crop improvement"* Eds. B. N. Chakraborty & U. Chakraborty. Satish serial publishing house, Delhi. pp. 119-128.
5. Saha B., Saha D. and **Saha A**. (2013) Detection of *Tomato leaf curl virus* in cultivated varieties of tomato and other plants of sub-Himalayan West Bengal. (2013) *In "Microbial Resources for crop improvement"* Eds. B. N. Chakraborty & U. Chakraborty. Satish serial publishing house, Delhi. pp. 263-275.
6. Saha, A., Dasgupta, S., Mandal, P. and Saha, D. 2005. Reduction of disease incidence in young tea plants against *Curvularia eragrostidis* by biotic and abiotic elicitors. *In Proceedings of the National Symposium on*

current Perspectives in Stress Biology (eds. U. Chakraborty & B.N. Chakraborty) pp 238-242. Narosa Publishing House. New Delhi.

7. Saha, D. and Pal, J. 2001. Production of extracellular hemolysin from fish pathogenic bacteria isolated from EUS affected air breathing fishes. *In* Recent advances in Animal Science Research, Vol 1: 115-120. Orion Press International.
8. Saha, A.; Mazumdar, S.; RoyChowdhury, P. and Saha, D. 2002. A foliar disease of *Streptocaulon sylvestre* an endemic and endangered plant. *In* Perspectives of Plant Biodiversity. (ed. A. P. Das) pp. 537-544.