



Dr. ARKA PRATIM CHAKRABORTY
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CURRICULUM VITAE

Name: **Dr. ARKA PRATIM CHAKRABORTY**

Designation: Assistant Professor, Department of Botany, Raiganj University

Date of Birth: 11.07.1983

Name of the Institution with Address: Department of Botany, Raiganj University, University Road, UttarDinajpur, Pin-733134

Contact number: 09474141311/08945518753

E-mail: arka.botanyrgu@gmail.com

Website: www.raiganjuniversity.ac.in

Teaching Interest: MICROBIOLOGY, PLANT PATHOLOGY, ARCHEGONIATES, PHYCOLOGY, BIOCHEMISTRY & BIOMOLECULES, PLANT PHYSIOLOGY, BIostatISTICS, MORPHOLOGY & ANATOMY

Research Interest: Microbiology, Plant Pathology, Biotic Stress, Plant Growth Promoting Rhizobacteria, Plant-Microbe Interactions.

EDUCATIONAL QUALIFICATION

| Sl.No | Year | Name of the Examinations | Board/University | Percentage (%) | Division/Grade |
|-------|----------------------------|---|-------------------------|----------------|---|
| 1 | 2014 | Ph.D. (UGC Regulation 2009) (Thesis Title: Studies on <i>Bacillus megaterium</i> and <i>Serratia marcescens</i> as plant growth promoters and biocontrol agents) | North Bengal University | 89.5% | A+ (obtained in Ph.D. course work Examination) |
| 2 | 2017(17 th DEC) | CSIR UGC NET LS | CSIR, NEW DELHI | *AIR 46 | *AIR 46 |
| 3 | 2007 | GATE | - | Gate score-317 | GATE Percentile 83.0 percentile |
| 4 | 2006 | M.Sc (Botany) Spl. Paper- Microbiology | North Bengal University | 80.41% | 1 st class 1 st (Gold Medalist) (Distinction) |
| 5 | 2004 | B.Sc (Botany Hons.) | North Bengal University | 65.12% | 1 st class (Distinction) |
| 6 | 2001 | Higher Secondary | WBCHSE | 65.1% | 1 st Division |
| 7 | 1999 | Madhyamik Pariksha | WBBSE | 81.37% | 1 st Division |

*AIR= ALL INDIA RANK.

TEACHING EXPERIENCE

| Time Period | DESIGNATION | INSTITUTE |
|------------------------|--|---|
| 01.11.2017-22.01.2020 | Full time Assistant Professor in Botany on contractual basis | GYAN JYOTI COLLEGE, affiliated to North Bengal University |
| 24.01.2020- Continuing | Assistant Professor in Botany, Raiganj University | Raiganj University, University Road, Uttar Dinajpur |

RESEARCH EXPERIENCE

| YEAR | DESIGNATION | INSTITUTE |
|--------------------------|---|-------------------------|
| 01.06.2007-31.05.2009 | Junior Research Scholar for two years under DBT sponsored project entitled “ <i>Studies on two rhizobacterial isolates of tea for development as biofertilizer and biocontrol agent</i> ” | North Bengal University |
| 01.06.2009-02.05.2010 | Senior Research Scholar for one year under DBT sponsored project entitled “ <i>Studies on two rhizobacterial isolates of tea for development as biofertilizer and biocontrol agent</i> ” | North Bengal University |
| 27.05.2011- 26.06.2012 | Senior Research Scholar for one year in the CSIR sponsored project “ <i>Amelioration of abiotic stresses in wheat varieties by osmo-tolerant and plant growth promoting rhizobacteria and elucidation of their mechanism of action</i> ” | North Bengal University |
| 01.12.2012-31.03.2014 | Senior Research Scholar for one year and three months in ICAR funded research project of NBAIM entitled “ <i>Application of Microorganisms in Agriculture and Allied Sectors</i> ” | North Bengal University |
| 13.08. 2014 – 31.03.2016 | Post Doctoral Fellow (Research Associate- CSIR) in a CSIR sponsored project “Screening for resistance in wheat germplasm against spot blotch disease and immunological characterization of defense proteins triggered by <i>Bipolaris sorokiniana</i> ” | North Bengal University |

ADMINISTRATIVE EXPERIENCE

1. Member, PG Board of Studies in Botany, Raiganj University
2. Member, UG Board of Studies in Botany, Raiganj University
3. Member, UG Board of Moderators in Botany, University of North Bengal and in University of Gour Banga
4. Member, UG & PG Board of Moderators in Botany, Raiganj University
5. Course Coordinator for the Diploma Course in Fishery, Raiganj University w.e.f. 15.02.2021-Feb, 2023
6. Member, COVID-19 MONITORING COMMITTEE, 2021- RAIGANJ UNIVERSITY CAMPUS
7. Member, NAAC COMMITTEE, 2021- RAIGANJ UNIVERSITY for preparation of SSR, RE-DVV
8. Assistant Controller (Officiating) of Examinations, Raiganj University w.e.f. 15.12.2021 to 22.09.2023
9. Member, UG Board of Studies of Environmental Studies, Raiganj University
10. Convener of the Committee for preparation of Association of Indian Universities related data for Raiganj University
11. One of the Committee members for preparation of AISHE related data for Raiganj University
12. Act as Raiganj University Representative at EILLM, Jalpaiguri campus for PG 1st semester exam, 2022
13. One of the members of the Ph.D. Committee, Department of Botany from 20.04.2023 for four years tenure
14. One of the members of the students’ hand book preparation committee, Raiganj University
15. Act as Raiganj University Representative at EILLM, Jalpaiguri campus for UG 2nd & 4th semester exam, 2023
16. One of the members to prepare the diary, calendar for RGU for year 2024
17. A member of the board of examiners in Microbiology practical examination for M.Sc. 1st semester examination, 2023 in Botany at the Department of Botany, NBU on 12.02.2024

18. Appointed as Centre in Charge of Raiganj- II Centre (1407) by the W.B. Council of H.S. Education for Higher Secondary Examination, 2024 from 16.02.2024 to 29.02.2024 and HS exam 2025 from 03.03.2025 to 18.03.2025.
19. Acted as a Raiganj University Representative at EIILM, Jalpaiguri campus to conduct MBA PG examination 2023, held in March, 2024 from 11.03.2024 to 15.03.2024
20. One of the member of the committee for observation of World Environmental Day- 5th June, 2024 at the Raiganj University.
21. Selected as one of the unit-III program NSS unit coordinators for the NSS unit, Raiganj University from 01.08.2024 for the tenure of two years.
22. Member, UG BOS Botany- Major under NEP-2020 syllabus at the UGB, Malda from 25.7.2024 For four years tenure.
23. One of the member of the UG 6th semester Honors University examination liaison committee From 22.8.2024 to 31.08.2024.
24. One of the internal members of the advisory committee for the AASM medicinal garden of the Raiganj University from 02.09.2024 onwards.
25. Acted as a Raiganj University Representative at EIILM, Jalpaiguri campus to conduct BBA/MBA UG and PG examination 2024, held in September, 2024 from 23.09.2024 to 26.09.2024
26. One of the member of the UG 2nd and 4th semester Honors University examination-2024 liaison Committee.
27. One of the member of the committee for preparation of annual report of the Raiganj University For the period from 2020 to 2021.
28. Acted as Nodal Officer on behalf of the Raiganj University for providing data for BENGAL GLOBAL BUSINESS SUMMIT (BGBS) 2025

TECHNICAL KNOW HOW

1. Characterization of Microorganisms

(a) Morphological Characterization: *In vitro* characterization of microorganisms for Agriculturally Important properties like phosphate solubilization, chitin degradation, protein hydrolysis, IAA production, HCN production, Siderophore production.

(b) Molecular characterization: 16S rDNA and 18S rDNA sequencing, NCBI BLAST.

2. Instrumentation

(a) Spectrophotometric analysis of important phytochemical compounds

(b) HPLC analysis of different phytochemical compounds

(c) SDS-PAGE analysis of total soluble protein (TSP)

- (d) PAGE analysis of isozymes
- (d) Scanning Electron Microscopy (SEM) and Transmission Electron Microscopy (TEM)
- (e) Freeze dry techniques (Lyophilization) for sample processing

3. Immunotechniques

- (a) Preparation of plant/fungal/bacterial antigens
- (b) Production of polyclonal antibodies and IgG purification for immunological studies
- (c) Enzyme Linked Immuno Sorbent Assay (ELISA)
- (d) DOT immunobinding assays (DIBA)
- (e) Immunofluorescence
- (f) Western blotting

4. Molecular Techniques

- (a) DNA isolation
- (b) Polymerase chain reaction (PCR) techniques
- (c) RAPD-PCR analysis
- (d) DGGE analysis
- (e) cDNA Microarray analysis
- (f) Quantitative RT PCR

Sequence of following microorganisms submitted to NCBI

| NCBI Accession No | Name of Organism | Category |
|--------------------------|---|--------------------------------------|
| NCBI JX312687 | <i>Bacillus megaterium</i> (TRS 7) | PGPR |
| NCBI JN020963 | <i>Serratia marcescens</i> (TRS1) | PGPR |
| NCBI JN983127 | <i>Bacillus amyloliufaceins</i> (TRS 6) | PGPR |
| NCBI KJ917553 | <i>Pseudomonas poae</i> (RM K03) | PGPR |
| NCBI KM066950 | <i>Bacillus stratosphericus</i> (CL.RH.01) | PGPR |
| NCBI KM117174 | <i>Bacillus amyloliquefaciens</i> (M RH 131) | PGPR |
| NCBI KM117175 | <i>Bacillus methylotrophicus</i> (M RH 130) | PGPR |
| NCBI KM192206 | <i>Bacillus thuringiensis</i> (M RH 127) | PGPR |
| NCBI KX894280 | <i>Streptomyces tricolor</i> (ARHS/PO26) | Actinomycetes |
| NCBI KX894281 | <i>Streptomyces flavogriseus</i> (ARHS/PO27) | Actinomycetes |
| NCBI JX660689 | <i>Bacillus safensis</i> (W10) | Salt tolerant PGPR |
| NCBI JX660688 | <i>Ochrobactrum pseudogregnonense</i> (IP8) | Salt tolerant PGPR |
| NCBI KJ917554 | <i>Bacillus mycoides</i> (MHB) | Mycorrhiza Helper Bacterium |
| NCBI KT768093 | <i>Enterobacter asburiae</i> (E/B/L/P-2) | Endophyte |
| NCBI KM066949 | <i>Bipolaris sorokiniana</i> (WH.PBW.IP.04) | Foliar pathogen |
| NCBI KT768092 | <i>Bipolaris oryzae</i> (R1.DO.01) | Foliar pathogen |
| NCBI KM491736 | <i>Colletotrichum gloeosporioides</i> (SOM.CL.02) | Foliar pathogen |
| VERSION | <i>Enterobacter sp. ASE, whole genome shotgun sequencing project.</i> | <i>Enterobacter sp. ASE</i> isolated |

| | | |
|---|--|---|
| JAJTNE000000000.1 GI:2170964662 DBLINK BioProject: PRJNA786204 BioSample: SAMN23636983 | | from the gut of an infected <i>Bombyx mori</i> L. (Lepidoptera: Bombycidae) |
| NCBI KM491737 | <i>Curvularia sp</i> (SOM.CV.03) | Foliar pathogen |
| NCBI ON783721 | <i>Fusarium equiseti</i> (MUS LD 01) | Foliar Pathogen |
| NCBI ON783696 | <i>Bacillus pumilus</i> (MUSRH 05) | PGPR |
| NCBI OP541600 | <i>Bipolaris oryzae</i> | Leaf pathogen of rice |
| NCBI OP541862 | <i>Priestia flexa</i> | Actinomycetes |
| NCBI OQ267607 | <i>Cerrioporus squamosus</i> | Basidiomycetes Fungus |
| NCBI OQ415951 | <i>Bacillus thuringiensis</i> | PGPR |
| NCBI OR196770 | <i>Aspergillus niger</i> | Leaf pathogen of rice |
| NCBI OR236221 | <i>Talaromyces aurantiacus</i> | Leaf spot pathogen of banana |
| NCBI OR365417 | <i>Aspergillus niger</i> | Leaf spot pathogen of banana |
| NCBI ON246070 | <i>Curvularia lunata</i> (MLP-01) | Leaf spot pathogen of banana |
| NCBI ON955844 | <i>Enterobacter cloacae</i> (MRH06) | Endophytic bacterium |
| NCBI ON955872 | <i>Achromobacter xylosoxidans</i> (MRH 11) | Endophytic Bacterium |
| NCBI PP859166 | <i>Bacillus licheniformis</i> (RAC 21) | Actinobacterial strain |
| NCBI PQ143285 | <i>Streptomyces macrosporeus</i> (RAC 40) | Actinobacterial strain |
| NCBIPQ358464 | <i>Pseudomonas lundensis</i> (MRH-44) | Endophytic bacterium |
| NCBIPQ358484 | <i>Pseudomonas psychrophila</i> (MRH-34) | Endophytic bacterium |
| NCBIPQ358507 | <i>Paraclostridium bifermentans</i> (MRH-41) | |
| NCBIPQ467080 | <i>Meyerozyma guilliermondii</i> | Foliar pathogen |
| NCBIPV298078 | <i>Pollutimonas subterranea</i> (MRH-33) | Endophytic bacterium |
| NCBIPV298087 | <i>Bacillus arachidis</i> (MRH-31) | Endophytic bacterium |

RESEARCH TEAM MEMBERS

1. Sri Papan Chowhan- Ph.D. Research Scholar (Registered)
2. Sri Shambhu Swarnakar- Ph.D. Research Scholar (Registered)
3. Miss Sumi Paul- Ph.D. Research Scholar
4. Miss Oindrila Chakraborty- Ph.D. Research Scholar (Registered)

RESEARCH GUIDANCE

1. Ph.D. thesis- 04 ongoing
2. P.G. Dissertations: 06 completed

P.G. Dissertations Co-supervised

1. "***Cultivation, Importance and Diseases of Dragon Fruit***" by Tanjan Roy, Student of M.Sc (Botany) 4th semester- 2022
2. "***Morphological Characters of Dragon fruit, cultivation process and its fungal diseases***" by Md Motawakkel Haque, Student of M.Sc. (Botany) 4th semester-2022
3. "***Studies on Dragon fruit plant: Overview, Health benefits, cultivation process and diseases of Dragon fruit***" by Subhajit

Das, Student of M.Sc (Botany) 4th semester- 2022

4. “**Dragon fruit cultivation process in West Bengal and it’s diseases**” by Anish Ahmed Sk, Student of M.Sc. (Botany) 4th semester- 2022

P.G. Dissertations Supervised

1. Isolation of fungal pathogens from diseased leaves of *Musa paradisiaca* from Uttar Dinajpur District, their molecular identifications along with their natures of mode of infections in detached leaf and in field grown plant
by Debarati Das, Student of M.Sc (Botany) 4th semester- 2023

2. Isolation of fungal pathogens from diseased leaves of *Oryza* sp. and observation of natures of infections by the pathogens
By Nawaz Sharif, Student of M.Sc (Botany) 4th semester- 2023

RESEARCH PUBLICATIONS:

(Google Scholar citation- 1037, h- index-14, i-index-19)

Published In National and International Journals

International Journals= 20

National Journals= 35

1. Evaluation of *Ochrobactrum anthropi* TRS-2 and its talc based formulation for enhancement of growth of tea plants and management of brown root rot disease. U. Chakraborty, B.N.Chakraborty, M. Basnet and **A.P.Chakraborty**
Journal of Applied Microbiology, 107: 625-634 (2009); NAAS rating 2019 – 8.16 (Jrn ID-J069); Thomson Reuters (SCI) impact factor -2.386

2. Influence of *Serratia marcescens* TRS-1 on growth promotion and induction of resistance in *Camellia sinensis* against *Fomes lamaoensis*
U. Chakraborty, B.N.Chakraborty and **A.P.Chakraborty**
Journal of Plant Interactions, 5(4): 261-271 (2010); NAAS rating 2019 – 7.66 (Jrn ID J422); Thomson Reuters (SCI) impact factor- 1.628

3. Protection of tea plants against pest and pathogen through combined application of pesticide and plant growth promoting rhizobacterium
A.P.Chakraborty, B.N.Chakraborty and U. Chakraborty; Journal of Mycology and Plant Pathology, 40(4): 519-531 (2010); NAAS rating 2019– 5.79 (Jrn ID- J363)

4. Plant growth promotion and amelioration of salinity stress in crop plants by a salt-tolerant bacterium
Usha Chakraborty, Swarnendu Roy, **Arka Pratim Chakraborty**, Pannalal Dey and Bishwanath Chakraborty
Recent Research in Science and Technology, 3(11): 61-70 (2011)

5. Dual application of *Bacillus pumilus* and *Glomus mosseae* for improvement of health status of mandarin plants
U. Chakraborty, B.N.Chakraborty, S.Allay, U.De and **A.P.Chakraborty**
Acta Horticulturae, 892: 215-229 (2011)

6. Evaluation of *Bacillus megaterium* and *Serratia marcescens* and their bioformulations for promoting growth of *Camellia sinensis*
Chakraborty U, Chakraborty BN and **Chakraborty AP**
International Journal of Tea Science, 8(1): 69-80 (2012)
NAAS rating 2016 – 2.63 (Jrn ID- I179)

7. Induction of plant growth promotion in *Camellia sinensis* by *Bacillus megaterium* and its bioformulations
U. Chakraborty, B.N.chakraborty and **A.P.Chakraborty**
***World Journal of Agricultural Sciences*, 8(1): 104-112 (2012)**
8. Biological control sclerotial blight of tea using Arbuscular Mycorrhizal fungus and plant growth promoting rhizobacterium
B.N.Chakraborty, U. Chakraborty, U.De and **A.P.Chakraborty**
***International Journal of Tea Science*, 8(4): 27-35 (2012); NAAS rating 2016 – 2.63 (Jrn ID- I179)**
9. Water stress amelioration and plant growth promotion in wheat plants by osmotic stress tolerant bacteria
U.Chakraborty, B.N.Chakraborty, **A.P.Chakraborty** and P.L.Dey
***World Journal of Microbiology and Biotechnology*, 29: 789-803 (2013)**
NAAS rating 2019 – 8.10 (Jrn ID W024)
Thomson Reuters (SCI) impact factor- 2.100
10. Plant growth promoting Rhizobacteria mediated improvement of health status of tea plants
U. Chakraborty, B.N.Chakraborty, **A.P.Chakraborty**, K.Sunar and P.L.Dey
***Indian Journal of Biotechnology*, 12: 20-31 (2013)**
NAAS rating 2019 – 6.37 (Jrn ID I043)
JCR impact factor (2017)- 0.368
11. Water and salt stress alleviation in wheat induced by rhizosphere bacteria with multi- functional traits.
Chakraborty U, Chakraborty BN, **Chakraborty AP** and Dey PL.
***International Journal of Bioresource and Stress Management*, 4(2): 214-219 (2013). NAAS rating 2019 – 4.65 (Jrn ID I179)**
12. Molecular identification and immunological characterization of plant growth promoting rhizobacteria of *Camellia sinensis*
B.N. Chakraborty, U. Chakraborty, **A.P. Chakraborty** and P.L. Dey
***International Journal of Tea Science*, 10(3&4): 41-52 (2014)**
NAAS rating 2016 – 2.63 (Jrn ID- I179)
13. *Bacillus megaterium* from tea rhizosphere promotes growth and induces systemic resistance in tea against *Sclerotium rolfsii*
A.P. CHAKRABORTY, B.N. CHAKRABORTY and U. CHAKRABORTY
***Indian Phytopathology*, 68(3) (2015); NAAS Rating 2019 -5.90 (Jr, ID-1104).**
14. Induction of resistance in *Camellia sinensis* against *Sclerotium rolfsii* by dual application of *Rhizophagus fasciculatus* and *Bacillus pumilus*
Bishwanath Chakraborty, Usha Chakraborty, Utanka Kumar De and **Arka Pratim Chakraborty**
***Archives of Phytopathology and Plant Protection*, 48: 825-840, 2016; SJR Impact Factor: 0.209; SNIP Impact Factor: 0.345(Scopus).**
15. Serological and molecular detection of *Bipolaris sorokiniana* Sacc. causing Spot blotch disease of wheat
B. N. CHAKRABORTY, U. CHAKRABORTY, **A. P. CHAKRABORTY** AND P. SASHANKAR
***Journal of Mycopathological Research*, 54(1): 117-125, 2016 (ISSN 0971-3719); NAAS rating 2019 – 4.90 (Jr. ID- J364)**
16. Resistance in tea plants against root rot pathogens induced by arbuscular mycorrhizal fungi and plant growth promoters
U. CHAKRABORTY, B. N. CHAKRABORTY, **A. P. CHAKRABORTY** AND U.K.DE

Journal of Mycopathological Research, 54(2) : 211-224, **2016** (ISSN 0971-3719); NAAS rating 2019 – 4.90 (Jr. ID- J364)

17. Development of Immunological Formats for Detection of *Bipolaris sorokiniana* in Wheat Leaf and Strategies for Induction of Resistance against Spot Blotch Disease using Bioinoculants

A.P. Chakraborty, U. Chakraborty and B.N. Chakraborty

Journal of Mycology and Plant Pathology, 46(1): 21-37, **2016**; NAAS rating 2019 – 5.79 (Jrn ID- J363)

18. Evaluation of Streptomyces and non- Streptomyces Actinomycetes isolates for growth promotion in *Vigna radiata* and their use as biocontrol agent against *Sclerotium rolfsii*

Pushpanjali Ray, **Arka Pratim Chakraborty** and Bishwanath Chakraborty

NBU Journal of Plant Sciences (ISSN NO-09746927)- 10(1): 73-79, **2016**.

19. Biochemical and molecular characterization of *Streptomyces* species isolated from Agricultural field of North Bengal and evaluation for growth improvement and suppression of sclerotial blight diseases of *Vigna radiata*

Pushpanjali Ray, **Arka Pratim Chakraborty** and Bishwanath Chakraborty

Journal of Mycology and Plant Pathology, 46(4): 344-354, **2016**; NAAS rating 2019 – 5.79 (Jrn ID- J363)

20. PGPR in managing root rot disease and enhancing growth in mandarin (*Citrus reticulata* Blanco.) seedlings

B.N. Chakraborty, S. Allay, **A.P. Chakraborty** and U. Chakraborty

Journal of Horticultural Sciences, 11(2): 104-115, **2017**; NAAS rating 2019 – 3.43 (Jrn ID- J273)

21. Biochemical Responses of *Sorghum bicolor* and *Triticum aestivum* to spot blotch disease and induction of resistance by Plant Growth Promoting Rhizobacteria .

Priyanka Bhattacharjee, Jayanwita Sarkar, **Arka Pratim Chakraborty**, Usha Chakraborty and Bishwanath Chakraborty

Journal of Mycology and Plant Pathology, 47(3): 251-261, **2017**; NAAS rating 2019 – 5.79 (Jrn ID- J363)

22. *Bacillus safensis* from wheat rhizosphere promotes growth and ameliorates salinity stress in wheat

U Chakraborty, B N Chakraborty, P L Dey and **A P Chakraborty**

Indian Journal of Biotechnology vol 17, JULY **2018**; NAAS rating 2019 – 6.37 (Jrn ID I043), JCR impact factor (2017)- 0.368

23. Biochemical responses of wheat plants primed with *Ochrobactrum pseudogrignonense* and subjected to salinity stress

U. chakraborty, B.N.Chakraborty, P.L.Dey, **A.P.Chakraborty** and J.Sarkar

Agricultural Research Journal (Springer), <https://doi.org/10.1007/s40003-018-0394-7>; NAAS rating 2019- 5.60 (Jrn ID A090)

24. Mycorrhiza Helper Bacteria: Future Prospects

Subash Kumar Gupta, **Arka Pratim Chakraborty**

International Journal of Research and Review (E-ISSN: 2349-9788; P-ISSN: 2454-2237); Vol.7; Issue: 3; **March 2020** (pp-387-391). Index Copernicus Value for 2018= 95.79.

25. Cyanobacterial Biofertilizer for sustainable agriculture and environment

Subash Kumar Gupta, **Arka Pratim Chakraborty**

International Journal of Creative Research Thoughts (ISSN: 2320-2882); Vol.8; Issue: 4; **April 2020** (pp-4-10). IMPACT FACTOR-7.97(GOOGLE SCHOLAR)

26. Carrier Based Bioformulations of PGPR- Characteristics, Shelf life and Application in Improving Health Status of Crop Plants- A Mini Review

Arka Pratim Chakraborty

International Journal of Research and Review (E-ISSN: 2349-9788; P-ISSN: 2454-2237); Vol.7; Issue: 4; **April 2020** (pp-88-98). Index Copernicus Value for 2018= 95.79

27. *In Vitro* Biochemical Characterization of Plant Growth Promoting Attributes of *Bacillus megaterium* (TRS 7)- A Potent Plant Growth Promoting Rhizobacterium (PGPR)

Arka Pratim Chakraborty, Bishwanath Chakraborty, Usha Chakraborty

International Journal for Science and Advance Research In Technology- ISSN [Online]: 2395-1052; Volume 6 Issue 4 – **APRIL 2020**; pp- (277-282); Impact Factor- 5.888 and Thomson Reuters Researcher ID: A-3489-2019

28. Analyses of soluble proteins and phenolics in susceptible and resistant wheat genotypes against *Bipolaris sorokiniana* causing spot blotch disease

A. P. Chakraborty, U. Chakraborty and B. N. Chakraborty

Journal of Mycopathological Research, 58(1&2): 65-69; **April & July issues 2020** (ISSN 0971-3719); NAAS rating 2019 – 4.90 (Jr. ID- J364)- **UGC CARE LISTED**

29. Immunity induced in wheat plants against *Bipolaris sorokiniana* by AMF colonization and application of *Bacillus altitudinis*

Arka Pratim Chakraborty, Bishwanath Chakraborty and Usha Chakraborty

Journal of the Botanical Society of Bengal, 74(1): 86-97, **2020** (ISSN 0971-2976)- **UGC CARE LISTED**

30. Multiple Mechanisms of Actions and Role in Ectomycorrhizae symbiosis by Mycorrhiza Helper Bacteria: A Mini Review

Papan Chowhan, **Arka Pratim Chakraborty**

Journal of Advanced Scientific Research; 11(3) Suppl 7: 10-15; **2020** (ISSN- 0976-9595)-**UGC CARE LISTED**

31. Three dimensional plant growth promoting activity of *Trichoderma asperellum* in maize (*Zea mays* L.) against *Fusarium moniliforme*

Zerald Tiru , Monalisha Sarkar , Ayon Pal , **Arka Pratim Chakraborty** & Parimal Mandal

Archives of Phytopathology and Plant Protection, DOI: 10.1080/03235408.2020.1860420

SJR Impact Factor: 0.209; SNIP Impact Factor: 0.345(Scopus).

32. Effect of different vegetable-grains media on variability in mycelial growth pattern and sclerotia formation of *Rhizoctonia solani*

Zerald Tiru , Monalisha Sarkar , **Arka Pratim Chakraborty**, Ayon Pal ,Parimal Mandal

Journal of Advanced Scientific Research; 12(1) Suppl 1: 295-300; March, **2021** (ISSN- 0976-9595)

UGC CARE LISTED

33. *In Vitro* Antagonistic Study of Maize Root Colonizing Fungal Isolates Against *Fusarium moniliforme* Causing Ear Rot Disease of Maize

Zerald Tiru, Monalisha Sarkar, **Arka Pratim Chakraborty**, Ayon Pal, Parimal Mandal

Journal of Tropical Life Science; 11(2): 133-139, May 2021; doi: 10.11594/jtls.11.02.02; (E-ISSN- 2527-4376)

UGC CARE LISTED

34. HPLC detection of different isomers of catechins in tea leaves induced by single and dual application of *Bacillus megaterium* and *Serratia marcescens*

A. P. Chakraborty, B. N. Chakraborty and U. Chakraborty

Journal of Mycopathological Research, 59(2): 145-154; **June issue 2021** (ISSN 0971-3719); NAAS rating 2019 – 4.90 (Jr. ID- J364)- **UGC CARE LISTED**

35. Understanding the potential of root microbiome influencing salt-tolerance in plants and mechanisms involved at the transcriptional and translational level

Swarnendu Roy, **Arka Pratim Chakraborty**, Rakhi Chakraborty

Physiologia Plantarum; Online published on 22.09.2021; <https://doi.org/10.1111/ppl.13570>

Journal Impact Factor=4.500; Online ISSN: 1399-3054

- 36.** Cross-Talk between the Microorganisms and Genetic Drivers of Drought Stress Responses: Present Understanding and Prospects for Crop Improvement under Drought Environment
Shambhu Swarnakar and **Arka Pratim Chakraborty**
Research Journal of Agricultural Sciences: An International Journal, P- ISSN: 0976-1675, E- ISSN: 2249-4538
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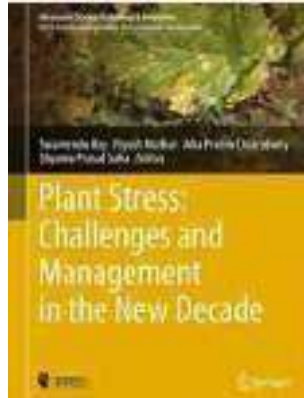
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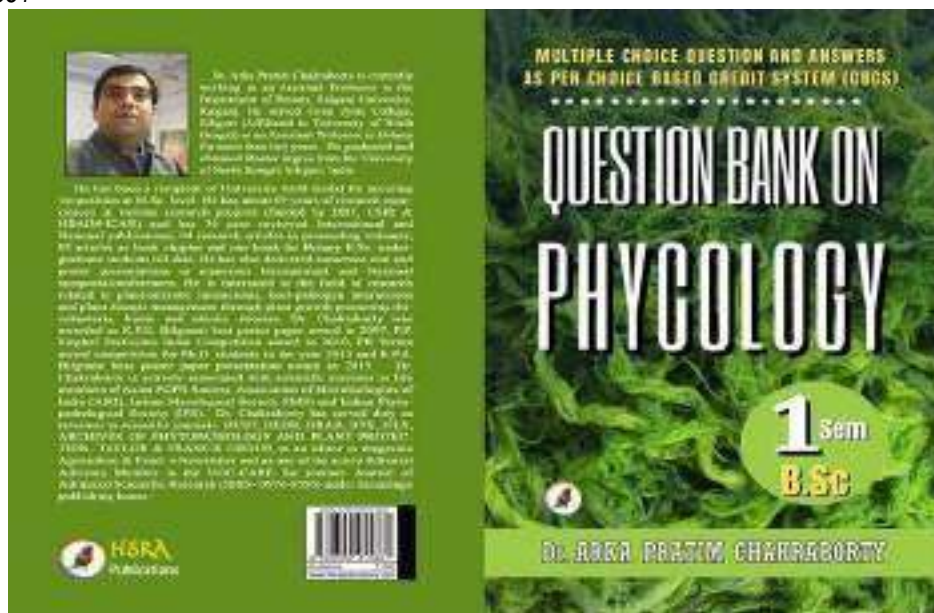
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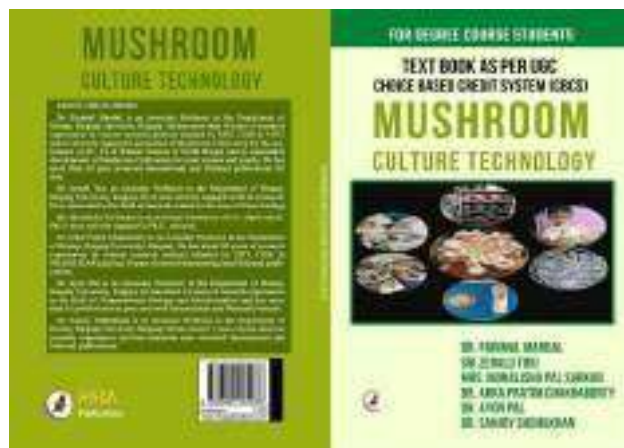
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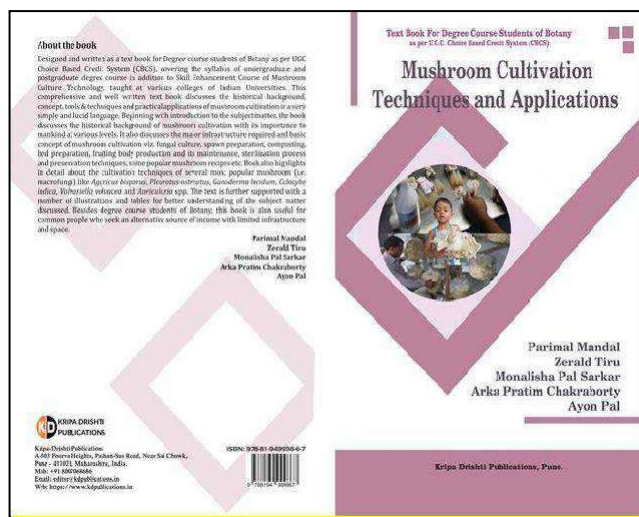
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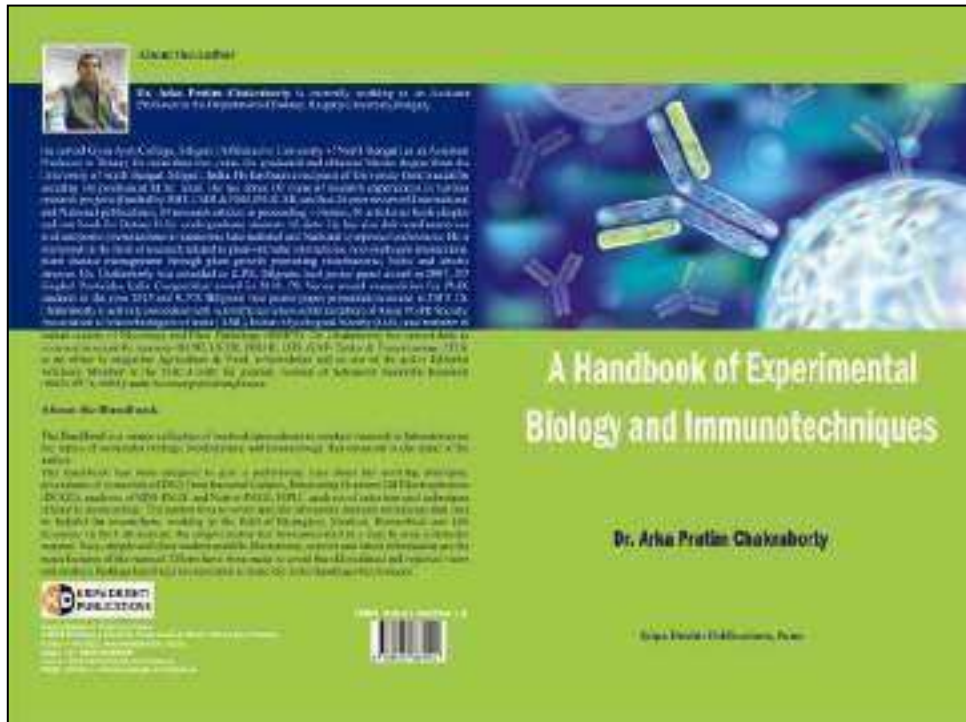
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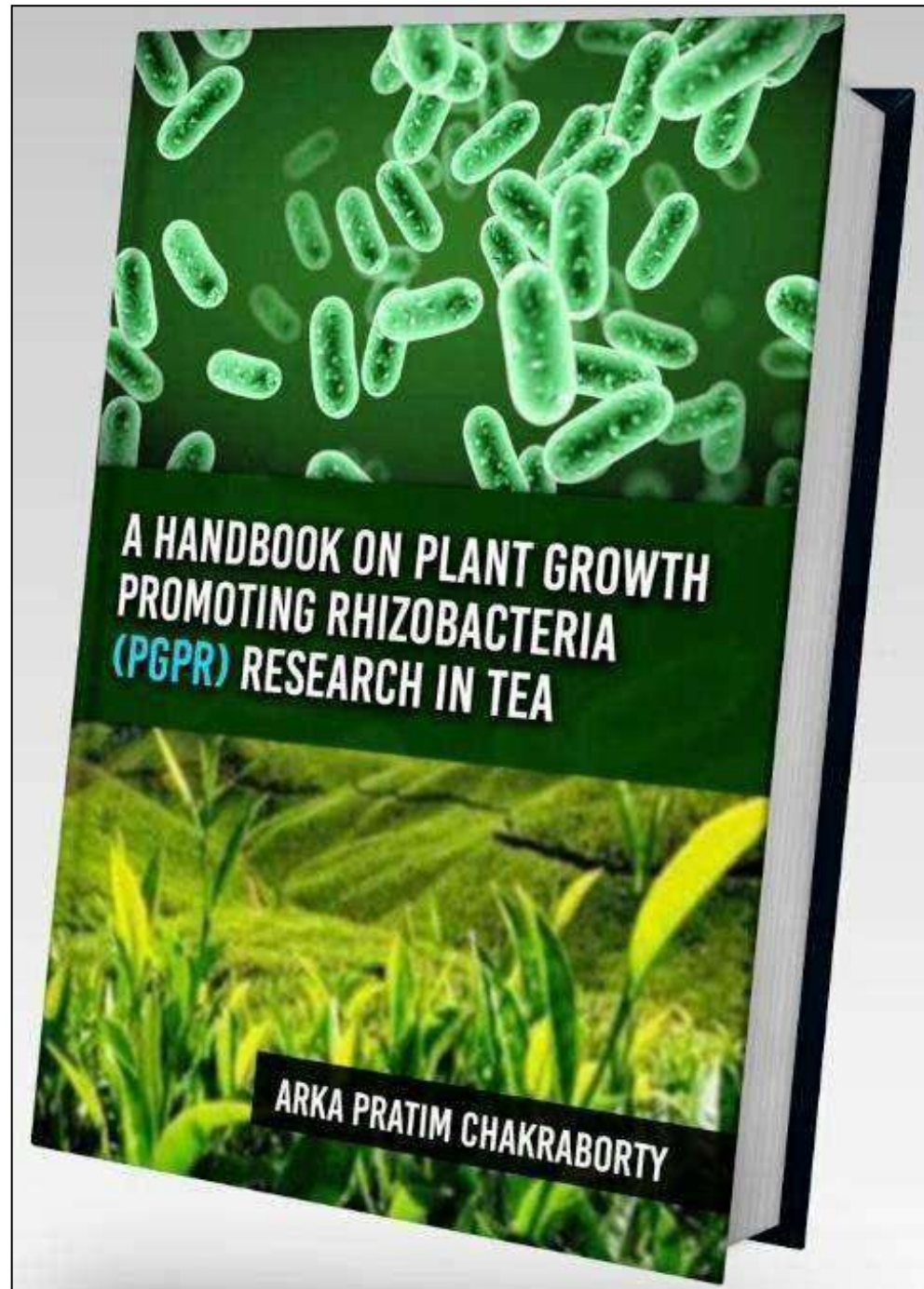
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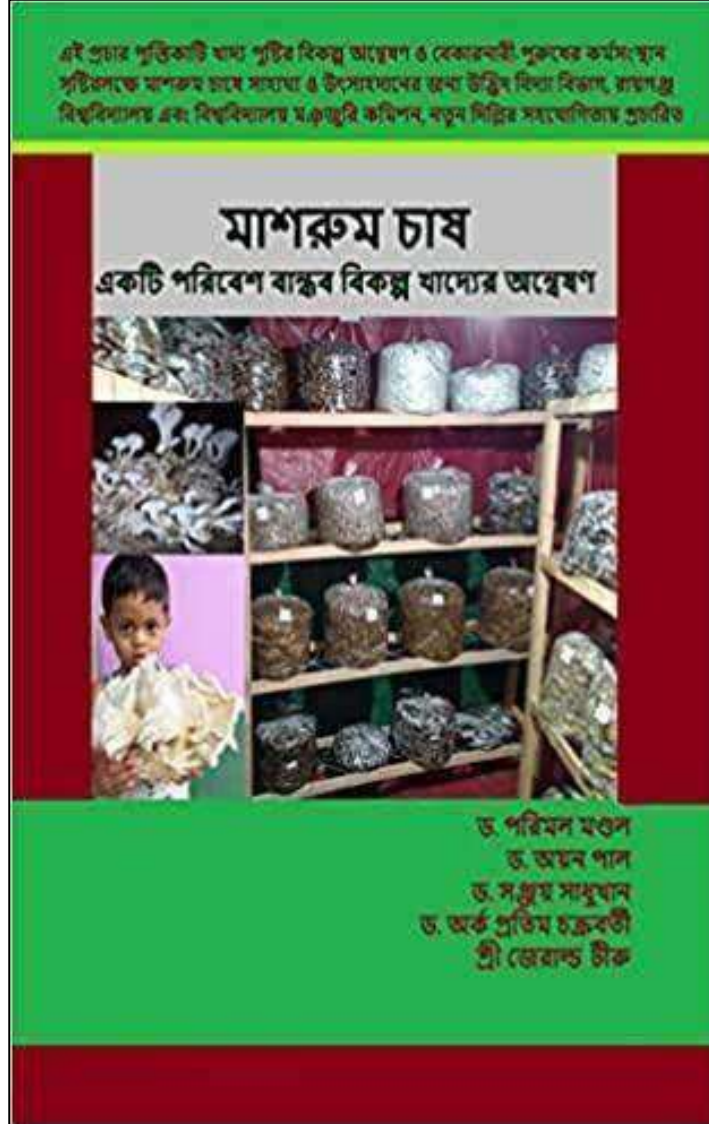
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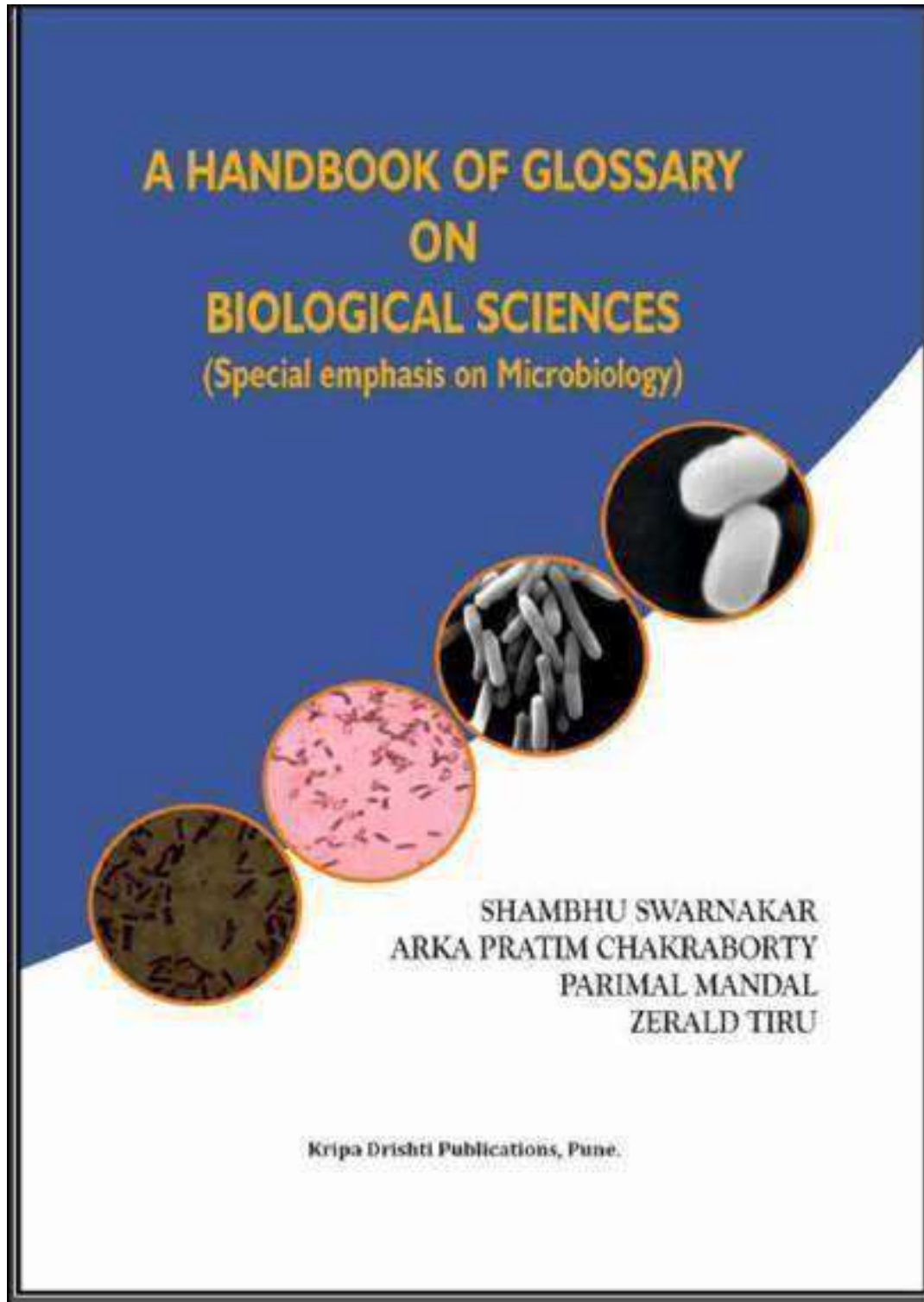
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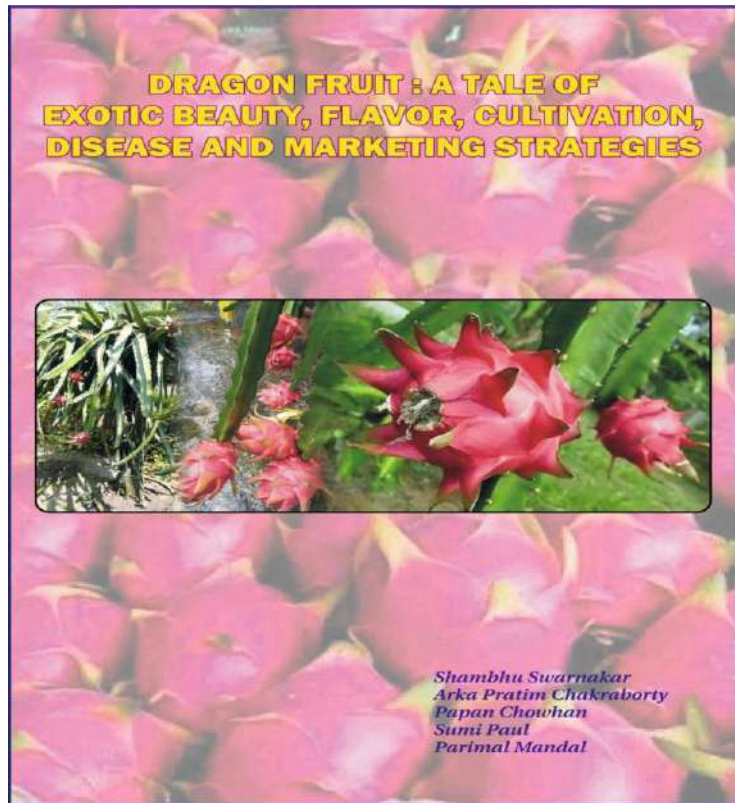
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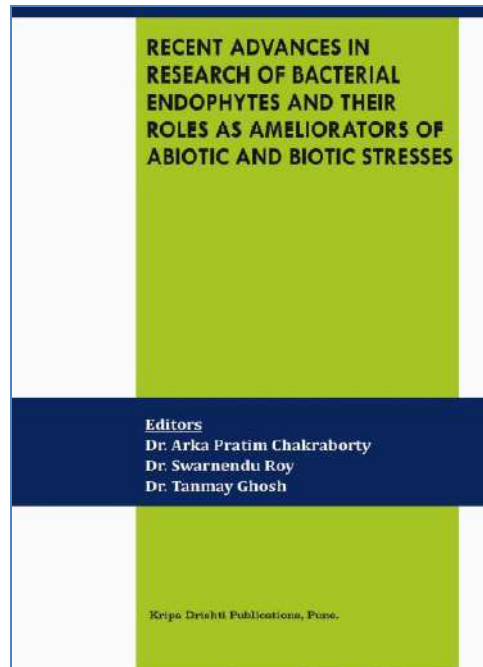
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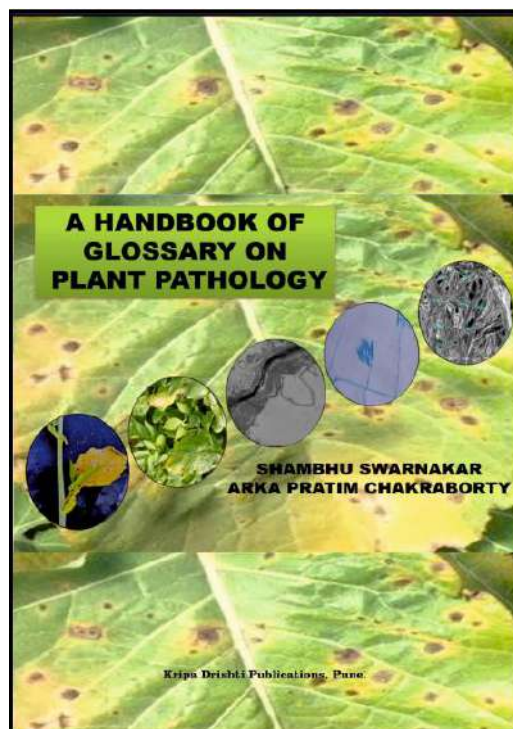
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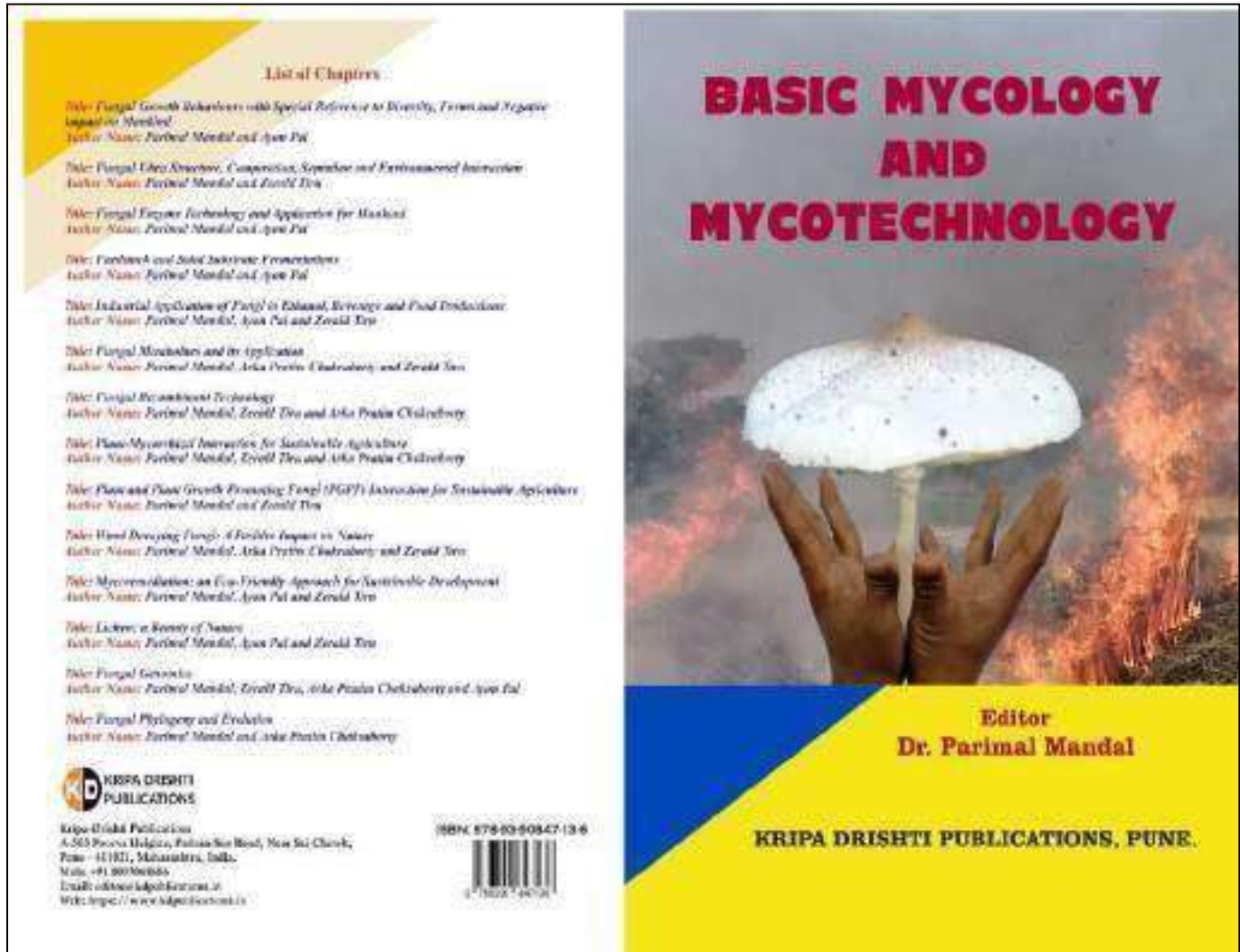
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Arnab Dey, Assistant Professor, Department of Botany, Raiganj University.

Chapter 7: Molecular Identification of Fungal Pathogen
Parimal Mandal, Associate Professor, Department of Botany, Raiganj University,
Arka Pratim Chakraborty, Assistant Professor, Department of Botany, Raiganj University,
Biswajit Pal Sarkar, Assistant Professor, Department of Botany, Raiganj University,
Arnab Dey, Assistant Professor, Department of Botany, Raiganj University.



Editor
Dr. Parimal Mandal



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Kripa Drishti Publications, Panna

2. Serological Study of Host Pathogen Interaction

Parimal Mandal

Associate Professor,
Department of Botany, Raiganj University,
West Bengal.

Arka Pratim Chakraborty

Assistant Professor,
Department of Botany, Raiganj University,
West Bengal.

4. Isolation, Identification of Fungi and Assessment of Disease

Parimal Mandal

Associate Professor,
Department of Botany, Raiganj University,
West Bengal.

Arka Pratim Chakraborty

Assistant Professor,
Department of Botany, Raiganj University,
West Bengal.

5. Study of Different Parameters of Plant Growth Induced by Plant Growth Promoting Fungi (PGPF) for Sustainable Agriculture

Parimal Mandal

Associate Professor,
Department of Botany, Raiganj University,
West Bengal.

Arka Pratim Chakraborty

Assistant Professor,
Department of Botany, Raiganj University,
West Bengal.

6. Induction of Defence Related Enzymes in Plant for Sustainable Agriculture

Parimal Mandal

*Associate Professor,
Department of Botany, Rajgarh University,
West Bengal*

Arka Pratim Chakraborty

*Assistant Professor,
Department of Botany, Rajgarh University,
West Bengal*

7. Molecular Identification of Fungal Isolates/Fungal Pathogens

Parimal Mandal

*Associate Professor,
Department of Botany, Rajgarh University,
West Bengal*

Arka Pratim Chakraborty

*Assistant Professor,
Department of Botany, Rajgarh University,
West Bengal*

3. Book- MUSHROOM CHASH

Authors

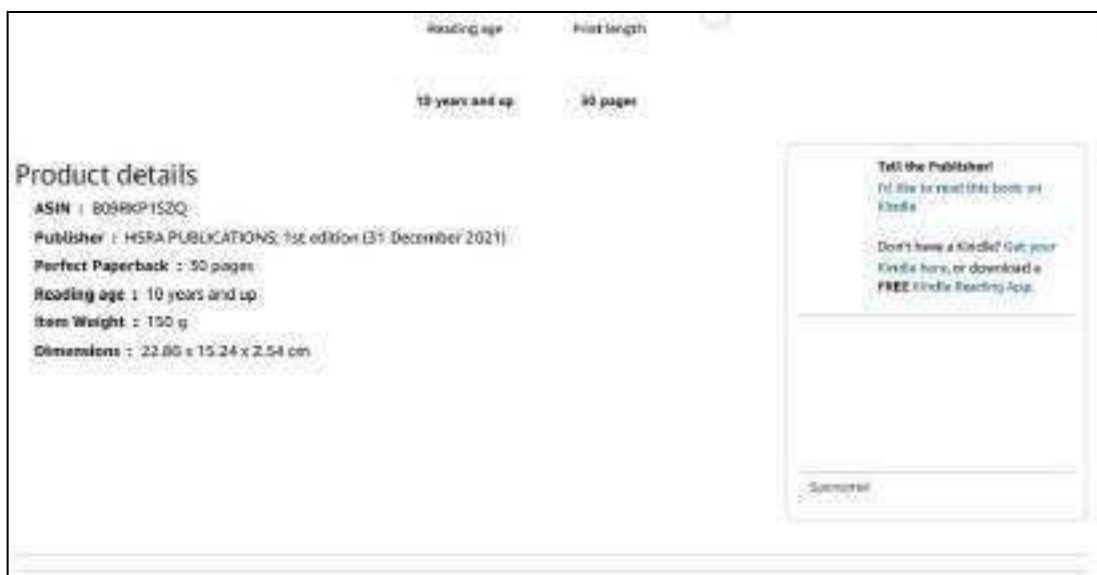
Dr. Parimal Mandal (Author), Dr. Ayon Pal (Author), Dr. Sanjoy Sadhukhan (Author),
Dr. Arka Pratim Chakraborty (Author), Sri Zerald Tiru (Author)

Publication date- 2021/12/31

Volume- 1; Pages- 30

PUBLISHING HOUSE: HSRA Publications; H.S.R.A PUBLICATIONS

www.hsrpublications.com



10. *A Laboratory Manual on Scanning and Transmission Electron Microscopy*

Authors

Shambhu Swarnakar, Papan Chowhan, Sumi Paul, Arka Pratim Chakraborty, Zerald Tiru, Parimal Mandal

Publication date 2022/10/15

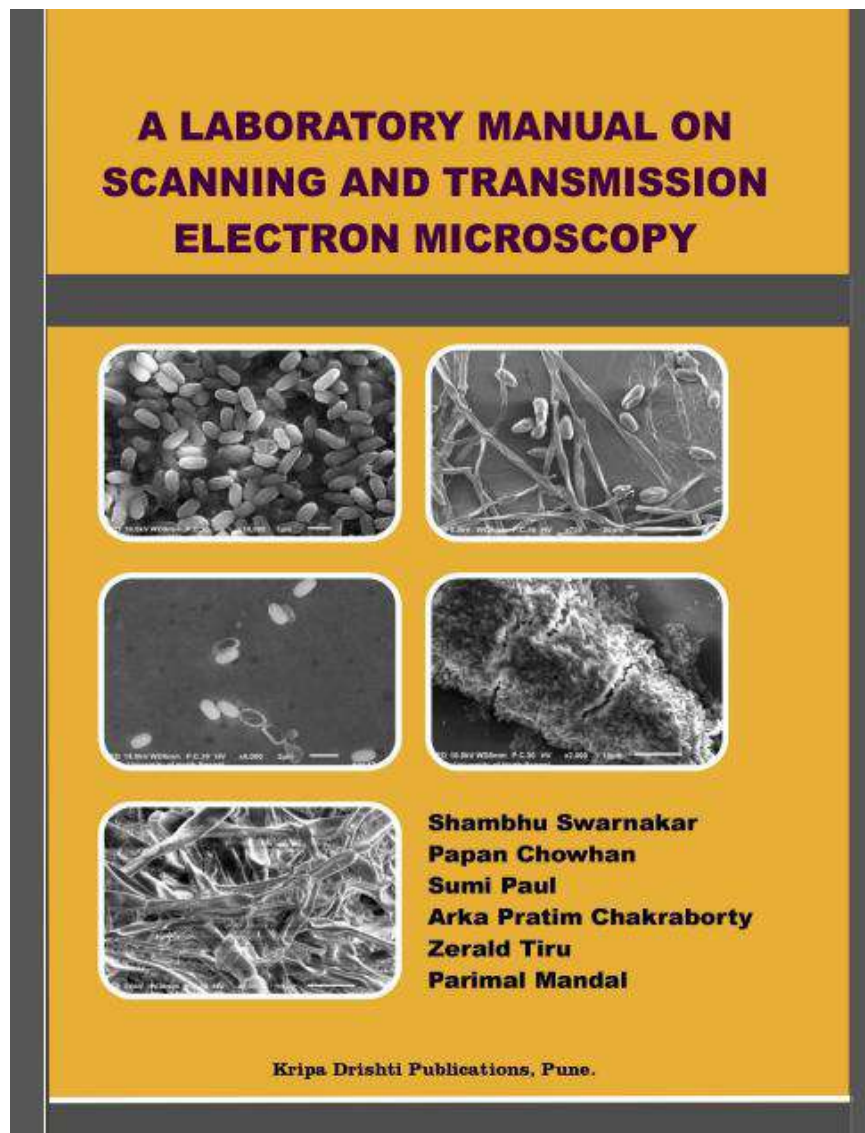
Volume 1

Pages 1-84

PUBLISHING HOUSE: Kripa Drishti Publication (KD PUBLICATIONS)

<https://www.kdpublications.in/>

ISBN-13 (15) 978-93-94570-78-8



11. Studies on Orchidoid Mycorrhizae and Mycobionts, Associated with Orchid Plants as Plant Growth Promoters and Stimulators in Seed Germination

Authors- Chakraborty, O., Agrawala, D.K., Chakraborty A.P. - 2023

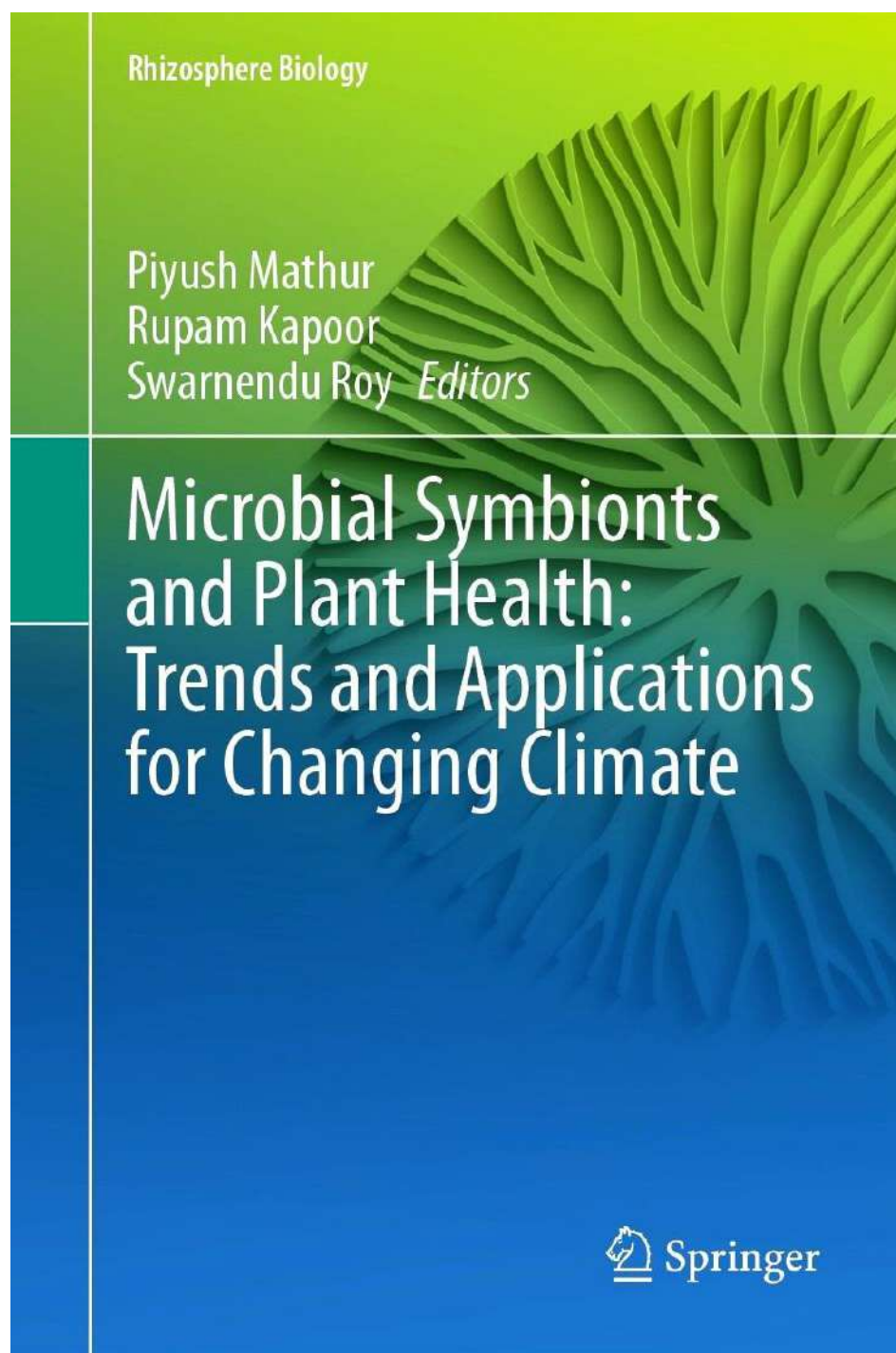
Publication date 2023/5/3; **Journal**

In: Mathur, P., Kapoor, R., Roy, S. (eds) **Microbial Symbionts and Plant Health: Trends and Applications for Changing Climate.** Rhizosphere Biology. Springer, Singapore. https://doi.org/10.1007/978-981-99-0030-5_16; Volume 1; Issue 1;

Pages- 439-463; **Publisher**

Rhizosphere Biology. Springer, Singapore.

<https://media.springernature.com/full/springer-static/cover-hires/book/978-981-99-0030-5?as=webp>



12. An Overview of Food-Borne Pathogenic Microbes: Classification, Mode of Actions, and Recent Advances in Strategies for Management of Food-Borne Pathogens.

Authors

A.P. Chakraborty Shambhu Swarnakar, Papan Chowhan

Publication date 2024/4/2

Book- In: Chakraborty, R., Mathur, P., Roy, S. (eds) Food Production, Diversity, and Safety Under Climate Change. Advances in Science, Technology & Innovation. Springer, Cham. https://doi.org/10.1007/978-3-031-51647-4_25

Volume 1

Pages 307-318

Publisher- Springer, Cham. https://doi.org/10.1007/978-3-031-51647-4_25

13. An Overview of the Role of Endophytic Bacteria as Plant Growth Promoters and Biocontrol Agents Against Pathogens of Different Crop Plants

Authors: Papan Chowhan, **Arka Pratim Chakraborty**

Publication date- 2025

Book- Mathur, P., & Mukherjee, S. (Eds.). (2025). Rhizosphere Engineering and Stress Resilience in Plants: Concepts and Applications (1st ed.). CRC Press. <https://doi.org/10.1201/9781003354109>

Volume 1, Pages-19, Publisher CRC Press- <https://doi.org/10.1201/9781003354109>

Awards Received

| Awards | Title of Paper | Authors | Presented at |
|--|---|--|---|
| 1. K.P.S. Bilgrami best poster paper award 2007 | Suppression of sclerotial blight and induction of resistance in tea by <i>Glomus fasciculatum</i> and rhizobacteria | U.Chakraborty, B.N.Chakraborty, I. Bhagat, K.Rai and A.P.Chakraborty | 2 nd Asian Congress of Mycology and Plant Pathology, December 19-22, 2007, organized by ISMPP and Osmania University |
| 2. Best poster paper award 2009 | Dual application of <i>Serratia marcescens</i> and <i>Bacillus megaterium</i> for plant growth promotion and root disease management of tea | U.Chakraborty, B.N.Chakraborty and A.P.Chakraborty | 5 th International Conference on Biopesticides: Stakeholders' Perspectives, 26-30 April, 2009 |
| 3. P.P. Singhal Memorial Pesticides India Award Competition (2 nd prize) 2010 | Protection of tea plants against pest and pathogen through combined application of pesticide and plant growth promoting rhizobacterium | A.P.Chakraborty , B.N.Chakraborty and U.Chakraborty | 32 nd Annual Conference & Symposium of ISMPP, NOV 24-26, 2010; organized by Junagadh Agricultural University |
| 4. K.P.S. Bilgrami best poster paper presentation award (2 nd prize) 2013 | Utilization of microbial resources for crop improvement and disease management | B.N.Chakraborty, U.Chakraborty, P.L.Dey, K.Sunar, A.P.Chakraborty , U.De and S.Allay | 34 Annual Conference & Symposium of ISMPP, January 21-23, 2013; organised by Department of Plant Pathology, Navsari Agricultural University, Gujarat |
| 5. K.P.S. Bilgrami best poster paper presentation award (1 st prize) 2014 | Harnessing the power of metabolomics and biopriming wheat plants to improve tolerance against biotic stress | B.N.Chakraborty, U.Chakraborty, A.P.Chakraborty , P.L.Dey, K.Sunar and Luis A.J.Mur | 35 th Annual Conference & Symposium of ISMPP, January 8-10, 2014; organized by Dr. Panjabrao Desmukh Krishi Vidyapith, Akola, Maharashtra |
| 6. PR VERMA Award competition for Ph.D students (1 st Prize) 2015 | Development of Immunological Formats for Detection of <i>Bipolaris sorokiniana</i> in Wheat Leaf and Strategies for Induction of Resistance against Spot Blotch disease using Bioinoculants | Arka Pratim Chakraborty , Usha Chakraborty and Bishwanath Chakraborty | 37 Annual Conference & Symposium of ISMPP, April 4-6, 2016; organized by Rajendra Agricultural University, Bihar Samatipur in collaboration with ISMPP. |
| 7. K.P.S. Bilgrami best poster paper presentation award, (1 st Prize) 2015 | Biochemical Responses of <i>Sorghum bicolor</i> and <i>Triticum aestivum</i> to spot blotch disease and induction of resistance by Plant Growth Promoting Rhizobacteria | Priyanka Bhattacharjee, Jayanwita Sarkar, Arka Pratim Chakraborty , Usha Chakraborty, Biswanath Chakraborty | 37 Annual Conference & Symposium of ISMPP, April 4-6, 2016; organized by Rajendra Agricultural University, Bihar Samatipur in collaboration with ISMPP. |

Published Abstracts in National/International Symposia/Conferences

1. Suppression of sclerotial blight and induction of resistance in tea by *Glomus fasciculatum* and rhizobacteria.

U. Chakraborty, B. N. Chakraborty, I. Bhagat, K. Rai and **A.P.Chakraborty**

Presented at 2nd Asian Congress of Mycology and Plant Pathology, December 19-22, 2007, organized by Indian Society of Mycology and Plant pathology and Osmania University Hyderabad.

Obtained K.P.S.Bilgrami first best poster paper award.

2. Application of PGPRs in tea rhizosphere for plant growth promotion and disease suppression.

U. Chakraborty, B.N.Chakraborty, M.Basnet and **A.P.Chakraborty**

Presentation of a paper in oral session in the National Symposium on "Diversity and Functionality of Plant and Microbes", January 24-25, 2008, organized by DRS Department of Botany, University of North Bengal.

3. An integrated approach for enhancing growth and yield of tea.

U. Chakraborty, B. N. Chakraborty and **A.P.Chakraborty**

Presented in poster session in the National Symposium on "New Biology in Agriculture", held at Panjab University, Chandigarh in collaboration with All India Biotech Association (AIBA), New Delhi on 7-8th November, 2008.

4. Evaluation of *Serratia marcescens* (TRS1) as a plant growth promoter of tea plants.

U. Chakraborty, B. N. Chakraborty and **A.P.Chakraborty**

Participated and presented the paper in oral session at Silver Jubilee National Symposium on "Sustainable Utilization of Plant and Microbial Resources", Feb 28-March 1, 2009; organized by DRS Department of Botany, University of North Bengal.

5. Dual application of *Serratia marcescens* and *Bacillus megaterium* for plant growth promotion and root disease management of tea.

U. Chakraborty, B. N. Chakraborty and **A.P.Chakraborty**

Presented at 5th International Conference on Biopesticides: Stakeholders' Perspectives, 26-30 April, 2009.

Obtained First Best poster paper award.

6. Isolation, biochemical and molecular characterization of salt-tolerant bacteria from rhizosphere of a facultative halophyte.

U. Chakraborty, B.N.Chakraborty, S.Roy, P.L.Dey and **A.P.Chakraborty**

Participated and Presented the paper in poster session at the 31st Annual Conference & Symposium on "Microbial Wealth- Plant Health", October 23-25, 2009; organized by Indian Society of Mycology and Plant Pathology and DRS- Department of Botany, University of North Bengal.

7. Dual application of *Glomus mosseae* and *Bacillus pumilus* in enhancing growth of tea and suppression of sclerotial blight disease.

U. Chakraborty, B.N.Chakraborty, U. De, **A.P.Chakraborty** and K. Rai
Presented the paper in oral session at the 31st Annual Conference Symposium on “ Microbial Wealth- Plant Health”, October 23-25, 2009; organized by Indian Society of Mycology and Plant Pathology and DRS- Department of Botany, University of North Bengal.

8.Application of bioformulations of PGPRs for plant growth promotion in tea seedlings.

U. Chakraborty, B.N. Chakraborty and **A.P. Chakraborty**

Participated and presented a paper in oral session at the 31st Annual Conference & Symposium on “Microbial Wealth- Plant Health”, October 23-25, 2009; organized by DRS- Department of Botany, University of North Bengal in collaboration with Indian Society of Mycology and Plant Pathology.

9.Protection of tea plants against pest and pathogen through combined application of pesticide and plant growth promoting rhizobacterium.

A.P. Chakraborty, B.N. Chakraborty and U. Chakraborty

Participated and presented a paper in oral session for **P.P.Singhal Memorial Pesticides India Award competition** at the 32nd Annual Conference & Symposium on “Innovations in plant pathology research and human resource development”, Nov, 24-26, 2010; organized by Junagadh Agricultural University in collaboration with Indian Society of Mycology and Plant Pathology.

Obtained 2nd prize in P.P.Singhal Memorial Pesticides India Award Competition.

10. Participated at the National seminar on “Diversity conservation and sustainable utilization of plants and traditional knowledge in Eastern Himalaya”, Dec 14-16, 2010; jointly organized by DRS- Department of Botany, University of North Bengal and East Himalayan Society for Spermatophyte Taxonomy.

11.Growth improvement of wheat plants by halo-tolerant PGPR in salt stressed conditions and associated changes in antioxidative and defense enzyme activities.

Chakraborty A.P., Chakraborty B.N., Pradhan B and Chakraborty U.

Participated at the National seminar on “Advances in abiotic and biotic stress management of plants.”, September 23-24, 2011; organized by DRS- Department of Botany, University of North Bengal in collaboration with Indian Society of Mycology and Plant Pathology.

12.Amelioration of salinity stress in crop plants by *Bacillus cereus* and elucidation of their mechanism of action.

A.P. Chakraborty, B.N. Chakraborty, S.Roy, P.L.Dey and U. Chakraborty

Presented in poster session at the International conference on “Microbial biotechnology for sustainable development”, Nov.3-6, 2011; jointly organized by Panjab University, Chandigarh and Association of Microbiologists of India(AMI).

13. Search for agriculturally important microorganisms from different regions of North Bengal for their utilization in the improvement of crop health.

B.N.Chakraborty, U. Chakraborty, P.L.Dey, K.Sunar, P.Ray and **A.P.Chakraborty**

Participated and presented a paper in poster session at the 3rd Global Conference on “Plant Pathology For Food Security”, January 10-13, 2012, jointly organized by Maharana Pratap University of Agriculture and Technology and Indian Society of Mycology and Plant Pathology.

14. Evaluation of plant growth promoting rhizobacteria for growth improvement of mandarin seedlings in nursery.

B.N.Chakraborty, U.Chakraborty, S.Allay and **A.P.Chakraborty**

Participated and presented a paper in oral session at the National Conference on “Biology and Bioinformatics of Economically Important Plants and Microbes”, Feb. 17-19, 2012, jointly organized by DRS-Department of Botany and Bioinformatics Facility, University of North Bengal.

15. Functional and genetic diversity of bacterial isolates from soils of North Bengal and utilization of the beneficial traits for crop improvement.

U.Chakraborty, B.N.Chakraborty, P.L.Dey, K.Sunar and **A.P.Chakraborty**

Participated at the National Seminar on “Biodiversity and sustainability vis-à-vis economic development in the Northern parts of West Bengal”, August 26-27, 2012, jointly organized by Department of Botany, Raiganj Surendranath Mahavidyalaya in collaboration with Department of Zoology, Alipurduar College, Jalpaiguri.

16. Alleviation of salinity and water stress in crop plants by osmo-tolerant plant growth promoting rhizobacteria.

U. Chakraborty, B.N.Chakraborty, **A.P.Chakraborty** and P.L.Dey

Participated at the National Symposium on Biotic and Abiotic Stresses on plants under changing climate scenario, **November 29-30, 2012**, jointly organised by Department of Plant Pathology, Uttar Banga Krishi Viswavidyalaya in collaboration with Indian Society of Mycology and Plant Pathology.

17. Utilization of Microbial Resources for Crop Improvement and Disease Management.

B.N.Chakraborty, U. Chakraborty, P.L.Dey, K. Sunar, **A.P.Chakraborty**, U. De and S. Allay

Presented at the 34th Annual Conference & Symposium of ISMPP on the theme “**Crop disease management: advances and challenges**”, **January 21-23, 2013**, jointly organised by Department of Plant Pathology, Navsari Agricultural University, Gujarat in collaboration with ISMPP.

Obtained 2nd prize for Prof. Krishna Sahai Bilgrami best poster paper presentation award 2013.

18. Participated at the National seminar (**PlamiSymp 2013**) on “Recent Trends in Plant and Microbial Research”, **March 22-23, 2013**, organized by the Department of Botany, NBU.

19. Induction of resistance in tea against root pathogens by plant growth promoters and arbuscular mycorrhizal fungi

U. Chakraborty, B.N. Chakraborty, **A. Chakraborty** and U.K. De

Paper was presented at 10 International Congress of Plant Pathology, held at Beijing, China, **August 25-30, 2013**. (*Acta Phytopathologia Sinica*, Vol. 43, 2013).

20. Biopriming of *Brassica juncea* and *Lycopersicon esculentum* seeds by PGPR isolates for growth promotion and induction of resistance against root rot pathogen. K.Sunar, P.L.Dey, **A.P.Chakraborty**, A. Subba, U.Chakraborty and B.N.Chakraborty
Paper was presented at the National Conference on New Frontiers in Medicinal Plant Research, **Oct. 3-4, 2013**, organized by Department of Ethnobotany and Social Medicine Studies, Sikkim University.

21. Dual application of *Bacillus pumilus* and *Glomus mosseae* for improvement of health status of mandarin plants.

Chakraborty U, Chakraborty B.N., Allay S, De U and **Chakraborty A.P.**

Paper was presented at the Second International *Citrus* Biotechnology Symposium, held at Catania, Italy, **Nov. 30- Dec. 2, 2009**.

22. Growth enhancement of tea seedlings induced by application of *Serratia marcescens* and *Bacillus megaterium* and associated biochemical changes. (CL-21)

A.P.Chakraborty, B.N.Chakraborty and U. Chakraborty

Participated and presented a paper at the National Conference on Biodiversity and Natural Resource Utilization, jointly organized by the Department of Botany, Visva-Bharati, Shantiniketan and NBARD, **March 14-16, 2010**.

23. Improvement of health status of plantation and horticultural crops by PGPR and AMF.

U. Chakraborty, B.N.Chakraborty, **A.P.Chakraborty**, P.Roy Chowdhury, U.De and S. Allay.

Paper was presented at the National Symposium on "Microbial Diversity and Bio-prospecting" and ISMPP North zone meet, held at University of Jammu, **Oct. 29-30, 2010**.

24. Exploitation of salt tolerant bacteria for induction of growth promotion and alleviation of salinity stress in plants and analysis of their mechanism of action.

U. Chakraborty, S. Roy, **A.P.Chakraborty**, P.L.Dey and B.N.Chakraborty

Paper was presented at the **International Conference on Plant Science in Post Genomic Era (ICPSPGE-2011)**.

25. Harnessing the power of metabolomics and biopriming wheat plants to improve tolerance against biotic stress.

B.N.Chakraborty, U. Chakraborty, **A.P.Chakraborty**, P.L.Dey, K. Sunar and Luis A.J.Mur

Presented at the 35th Annual Conference & Symposium of ISMPP on the theme "**Innovative and Ecofriendly Research Approaches for Plant Disease Management**", **January 8-10, 2014**, jointly organised by Dr. Panjabrao Desmukh Krishi Vidyapith, Akola, Maharashtra in collaboration with ISMPP.

Obtained 1 prize for Prof. Krishna Sahai Bilgrami best poster paper presentation award 2014.

26. HARNESSING THE POWER OF METABOLOMICS AND BIOPRIMING RICE PLANTS TO IMPROVE TOLERANCE AGAINST BIOTIC STRESS

B.N.CHAKRABORTY, U. CHAKRABORTY, S. KHATI, **A.P.CHAKRABORTY** AND LUIS A.J.MUR

st

Presented at International Symposium on Role of fungi and microbes in the 21 century- a global scenario, 20-22 February, 2014, Organised by Indian Mycological Society, Kolkata in collaboration with Department of Botany, University of Calcutta, Kolkata.

27. Search for potential PGPR isolates from Darjeeling hills, their molecular characterization and application for improvement of crop health status.
B.N.Chakraborty, U. Chakraborty, **A.P.Chakraborty**, K. Sunar and P.L.Dey
Presented at National Workshop on “**Advances in PGPR Research**” organised by Department of Mycology & Plant Pathology, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi in collaboration with Asian PGPR Society for Sustainable Agriculture, Hyderabad, India on **October 7-8, 2014.**

28. Evaluation of multi-functional traits of rhizospheric bacteria for induction of tolerance in wheat plants against abiotic and biotic stresses.
B.N.Chakraborty, U. Chakraborty, **A.P.Chakraborty** and P.L.Dey
Presented at National Workshop on “**Advances in PGPR Research**” organised by Department of Mycology & Plant Pathology, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi in collaboration with Asian PGPR Society for Sustainable Agriculture, Hyderabad, India on October 7-8, 2014.

29. Screening for resistance of wheat plants against *Bipolaris sorokiniana* causing spot blotch disease. B.N.Chakraborty, U.Chakraborty, **A.P.Chakraborty** and J.Sarkar
Presented at National Symposium on “**Unraveling plant-microbe interactions for supporting plant health**” organised by Department of Botany, Gauhati University, Gauhati in collaboration with Indian Society and Plant Pathology on October 27-28, 2014.

30. Evaluation of growth status of rice varieties following seed bacterization with plant growth promoting rhizobacteria
P Bhattacharjee, P Sashankar, **A P Chakraborty**, U Chakraborty, B N Chakraborty
Presented at National Symposium on “Unraveling plant-microbe interactions for supporting plant health” organised by Department of Botany, Gauhati University, Gauhati in collaboration with Indian Society and Plant Pathology on October 27-28, 2014.

31. Screening of wheat germplasm and utilization of plant growth promoting rhizobacterium for induction of resistance in wheat plants against spot blotch disease
A. P. Chakraborty, P.L.Dey, J.Sarkar, U.Chakraborty and B. N. Chakraborty
Presented at National Symposium on “Advances in Plant and Microbial Research” organised by the Department of Botany, University of North Bengal, Siliguri on December 12-13, 2014.

32. *Bipolaris sorokiniana*, a cereal pathogen causing spot blotch disease in wheat
(BT21)

Arka Pratim Chakraborty, Bishwanath Chakraborty and Usha Chakraborty
nd

Presented (Oral) at 22 West Bengal State Science and Technology Congress organised by Science and Technology Division, Govt. of West Bengal in collaboration with University of North Bengal on February 28-March 01, 2015.

33. Resistance in tea plants against root rot pathogens induced by arbuscular mycorrhizal fungi and plant growth promoters
U. Chakraborty, B.N. Chakraborty, A.P. Chakraborty and U.K. De
Paper was presented in oral session in National Symposium on **Microbial Diversity and Its Impact**, jointly organised by Indian Mycological Society, Kolkata in collaboration with Department of Botany, University of Calcutta during February 18-19, 2016.

34.

P(S9)417: Development of bioformulations with PGPR, PGPF and AMF for induction of resistance in wheat plants against *Bipolaris sorokiniana* causing spot blotch disease

A.P. Chakraborty, P. Sashankar, P. Bhattacharjee, U. Chakraborty and B.N.Chakraborty

Participated and presented a paper in the poster **session 9- Bio-prospecting in biocontrol agents for sustainable agriculture** in the 6th International Conference on Plant, Pathogens and People with the mission Challenges in Plant Pathology to benefit humankind, held at NASC Complex, New Delhi during February 23-27, 2016.

35.

MJN(E)01: Serological formats for screening inherent immunity and attempt to develop induced immunity in wheat plants using bioinoculants against *Bipolaris sorokiniana* causing spot blotch disease

A.P. Chakraborty, U. Chakraborty and B.N. Chakraborty

Participated and presented a paper in the **oral session for M.J. Narasimhan Academic Merit Award Contest** in the 6th International Conference on Plant, Pathogens and People with the mission Challenges in Plant Pathology to benefit humankind, held at NASC Complex, New Delhi during February 23-27, 2016.

36. Biochemical Responses of *Sorghum bicolor* and *Triticum aestivum* to spot blotch disease and induction of resistance by Plant Growth Promoting Rhizobacteria (PP-11).

Priyanka Bhattacharjee, Jayanwita Sarkar, **Arka Pratim Chakraborty**, Usha Chakraborty and Bishwanath Chakraborty

Participated and a paper was presented in the poster **session under theme & Technical session IV: Disease Management** in the 37th Annual Conference & Symposium of ISMPP on the theme "**Food security through Plant Health Protection**", **April 4-6, 2016**, jointly organised by Rajendra agricultural University, PUSA, SAMASTIPUR in collaboration with ISMPP.

st

Received 1 prize for K.P.S. Bilgrami best poster paper presentation award, 2015

37. Development of Immunological Formats for Detection of *Bipolaris sorokiniana* in Wheat Leaf and Strategies for Induction of Resistance against Spot Blotch disease using Bioinoculants

Arka Pratim Chakraborty, Usha Chakraborty and Bishwanath Chakraborty

Participated and a paper was presented in the oral **session in PR VERMA AWARD Competition for Ph.D student, 2015** in the 37th Annual Conference & Symposium of ISMPP on the

theme "**Food security through Plant Health Protection**", **April 4-6, 2016**, jointly organised by

Rajendra agricultural University, PUSA, SAMASTIPUR in collaboration with ISMPP.

st

Received 1 prize in PR VERMA Award competition for Ph.D students, 2015

38. Induction of defense responses in cereal crops against foliar fungal pathogens using bioinoculants

Bishwanath Chakraborty*, Usha Chakraborty, **Arka Pratim Chakraborty**, Amrita Acharya, Priyanka Bhattacharjee and Sweata Khati

A paper was presented in the poster **session under theme & Technical session III: Molecular Plant**

Pathology in the 38th Annual Conference & National Symposium of ISMPP on the theme

"**Challenges towards Plants Health under Changing Climate Scenario for Sustainable Agriculture**" **November 24-26, 2016**, jointly organised by **Department of Plant Pathology, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia, WB** in collaboration with ISMPP.

39. Innovative strategies for biotic and abiotic stress alleviation in wheat plants.

B.N. Chakraborty, U. Chakraborty, **A.P. Chakraborty**, J. Sarkar and P. Bhattacharya

A paper was presented at the National symposium & Delhi chapter meeting on **Innovative strategies for the management of plant disease under climate change scenario** at the Division of Plant Pathology, ICAR – Indian Agricultural Research Institute, New Delhi on **December 19, 2017**.

40. Participated in the *Interdisciplinary National Seminar on “Vistas in Life Science Research”* on **29.03.2019**; jointly organized by the Department of Biotechnology, Department of Microbiology, Department of Tea Science and Department of Bioinformatics, University of North Bengal, West Bengal, India.

41. Participated and *acted as Organising Secretary* in Organising Committee for organising **ONE DAY NATIONAL SEMINAR** on **“WOMEN EMPOWERMENT; LIVELIHOOD, EDUCATION, RIGHTS AND SUSTAINABILITY”** on **03.05.2019**, jointly organised by the Department of Political Science and Department of Geography, Gyan Jyoti College, Dagapur, Siliguri and submitted *abstract* entitled:

“Environmental Sustainability: Negative correlation between sustainability of ecosystem and climate change: challenges and remedial approach linked with special reference to plant-microbe interactions”

Dr. Arka Pratim Chakraborty, Asst. Professor, Department of Botany, Gyan Jyoti College.

42. SCREENING OF WHEAT GERMPLASM FOR RESISTANCE AGAINST SPOT BLOTCH DISEASE AND ANALYSIS OF DEFENSE MECHANISMS

ARKA PRATIM CHAKRABORTY, USHA CHAKRABORTY AND BISHWANATH CHAKRABORTY

Abstract of the paper published in the abstract book under the technical session- **MICROBES AND PLANT HEALTH** in the International Symposium on “Nature, Microbes & Society”, jointly organized by the **Indian Mycological Society, Kolkata** and the Department of Botany, University of Kolkata during **February 06-08, 2020**.

43. CULTIVATION OF MUSHROOM ON DIFFERENT AGRO RESIDUES TO REDUCE GLOBAL WARMING

Parimal Mandal, **Arka Pratim Chakraborty** and Zerald Tiru

Participated in poster session (**PP-15**) in the National Seminar on **“New Horizon in Botanical Research”**- Botsem 2020, organized by the Department of Botany, NBU during **February 20-21, 2020**.

44. Participated in the *Webinar on “HUMAN ORIGIN, HEALTH AND DISEASES”* on **23.05.2020** through online video conferencing (Link with Google Meet-meet.google.com/wkx-uokr-pep); **organized by the Centre for the Advanced Studies in Botany, University of Madras.**

Speaker: Dr. K. Thangaraj, Chief Scientist, CSIR-Centre for Cellular and Molecular Biology, Hyderabad- 500 007.

45. Participated in the *International Webinar on “Past and Future of Dermatobotanicals in Dermatopharmacology”* on **26.05.2020** through online YouTube video conferencing; **organized by the Department of Advanced Zoology & Biotechnology, Loyola College (Autonomous), Chennai, Tamil Nadu, India.**

46. Participated in the *International Webinar on “Science Communication and Analysis of Scientific Publications for enhanced visibility”* on 29.05.2020 through online video conferencing; organized by the Department of Zoology, Mizoram University, Aizawl, India.

47. Participated in the *Webinar on “Scope for the utilization of herbal medicines for human health in COVID-19 like scenario”* on 29.05.2020 through online Zoom Webinar video conferencing; organized by the PG & Research Department of Botany, V.O.Chidambaram College, Thoothukudi, India.

48. Participated in the *International Webinar on “STRATEGIES TO CONTROL COVID-19”* on 30.05.2020 through online Zoom Webinar video conferencing; organized by the Department of Botany, St.Joseph’s College (Autonomous), Tiruchirappalli, Tamil Nadu, India.

49. Participated in the *Webinar on “Covid and Digital Transformation”* on 30.05.2020 through online video conferencing (Link with Google Meet); organized by the Department of Management, University of North Bengal, West Bengal, India.

50. Participated in the *Indo-UK Virtual Conference ‘Current Innovations and the Future of Therapeutic Developments’ CIFTD-2020* during 1st-3rd June, 2020, organized by Centre for Biomaterials Cellular & Molecular Theranostics (CBCMT) at Vellore Institute of Technology (VIT), Vellore, India and Swansea University, United Kingdom

51. Participated in the *Webinar on “Microbes, Biology and Defences of the Chocolate Tree”* on 03.06.2020 through online video conferencing; organized by the Department of Botany, Mizoram University, Aizawl, India.

52. Participated in the *International Webinar Series on ‘Infectious Disease - Biology, Diagnosis, Preventive Strategies of Coronaviruses’* during 1st-4th June, 2020, organized by the Department of Plant Biology & Biotechnology, Loyola College (Autonomous), Chennai, Tamil Nadu, India.

53. Participated in the *Two Days International Webinar on ‘Current trends in chemical and material sciences’* during 3rd-4th June, 2020, organized by the Department of Chemistry, Kazi Nazrul University, West Bengal, India.

54. Participated in the *National Level Webinar on “Biodiversity Conservation with Special Reference to Agrobiodiversity”* on 04.06.2020 through online Zoom Webinar video conferencing; organized by the PG & Research Department of Botany, V.O.Chidambaram College, Thoothukudi, India.

55. Participated in the *National Webinar on “Waste Management during the Covid-19 Pandemic”* on 05.06.2020; organized by the School of Studies in Chemistry, Jiwaji University, Gwalior, India.

56. Participated in the *Webinars on “SALIVARY METABOLOMES AS A TOOL FOR SCREENING CANCERS AT AN EARLY STAGE”* and *“ADVANCES IN REGENERATIVE MEDICINE – THROUGH INDO-JAPANESE COLLABORATION”*

on **05.06.2020** through online video conferencing; **organized by the Department of Biotechnology, Mizoram University, Aizawl, India.**

57. Participated in the *Webinar on “The Importance of Symbiotic Microorganisms in Drug Discovery”* on **06.06.2020** through online video conferencing; **jointly organized by the Department of Forestry, Department of Environmental Science, School of Earth Science & Natural Resource Management, Mizoram University, Aizawl, India.**

58. Participated in the *Webinar on “Study of biomarkers for diagnosis and prognosis of tuberculosis infection”* on **06.06.2020** through online video conferencing; **jointly organized by the Department of Chemistry and Department of Biotechnology, Mizoram University, Aizawl, India.**

Resource Person: Dr. Amador Goodridge, Tuberculosis Biomarker Research Unit, Instituto de Investigaciones Científicas y Servicios de Alta Tecnología, INDICASAT-AIP, Panama.

59. Participated in the *Webinar on “Contribution of B-1 Cells during Mycobacterium infection”* on **06.06.2020** through online video conferencing; **jointly organized by the Department of Chemistry and Department of Biotechnology, Mizoram University, Aizawl, India.**

Resource Person: Dr. Ciara Ordonez, Tuberculosis Biomarker Research Unit, Instituto de Investigaciones Científicas y Servicios de Alta Tecnología, INDICASAT-AIP, Panama.

60. Participated and presented a paper in *One Day International Webinar on “COVID-19, THE FACTS AND FINDINGS”* on **08.06.2020**, through online video conferencing; **organized by the Department of Chemistry, Sidho-Kanho-Birsha University, Purulia-723104, West Bengal, India and submitted e-abstract entitled:**

“Targeting apoptosis signaling pathways through multiple mechanisms during infection induced by Coronavirus (CoV)”

Subash Kumar Gupta¹ and Arka Pratim Chakraborty^{2}*

¹Assistant Professor, Department of Botany, Gyan Jyoti College, Dagapur, Dist-Darjeeling, P.O.- Salbari- 734002, West Bengal India, Ph- 7908138116, E-mail: guptasubash60@yahoo.in

²Assistant Professor, Department of Botany, Raiganj University, Raiganj, Uttar Dinajpur-733134, West Bengal, India, Ph-8945518753

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61. Participated in the *Online Lecture Series Webinar-2 on ‘BIOLOGICALLY ACTIVE MUDFLATS’* on **13.06.2020**, **organized by the CHENNAI SCIENCE COLLOQUIUM (CSC), Chennai, India.**

62. Participated in the *Webinar on “Biomedical Sciences: A touch of Medicinal Plants”* on **17.06.2020** through online video conferencing; **organized by the Department of Horticulture, Aromatic and Medicinal Plants (HAMP), Mizoram University, Aizawl, India.**

63. Participated in the *Two Days International Webinar on ‘COVID-19: Impact, Preventive measures and Best Practices’* during **21st-22nd June, 2020**, **organized by the Department of Physics, Bhairab Ganguly College, West Bengal, India.**

64. Participated and presented a paper in *Three Days International Webinar on “Emerging Trends in Biotechnology: Current and Future Challenges in Biotechnology Research”* during 24th-26th June, 2020, through online video conferencing; jointly organized by the Department of Biotechnology, Pachhunga University College (PUC) and Mizoram University (MZU), Aizawl, India and submitted e-abstract entitled:

“A brief study of expressions of defense genes and genes involved in phytoalexin biosynthesis through Microarray and RT PCR analysis during induction of resistance in *Triticum aestivum* by plant growth promoting rhizobacterium against *Bipolaris sorokiniana* causing spot blotch disease”

Arka Pratim Chakraborty

Assistant Professor, Department of Botany, Raiganj University, Uttar Dinajpur-733134, West Bengal, India, Email: arkapratimchakraborty83@gmail.com

65. Participated in the *Two Days Online Special Lecture Series on ‘Current Trends in Basic Sciences and Career Opportunities’* during 25th-26th June, 2020, organized by the Department of Botany, Chemistry and IQAC, BMMV, Balurghat Mahila Mahavidyalaya, Balurghat, Dakshin Dinajpur, West Bengal, India.

66. Participated in *One Day ICPR sponsored International Webinar on “Yoga for Mankind: Peace and Practice”* on 08.07.2020, through online video conferencing; organized by the Department of Philosophy, Cooch Behar Panchanan Barma University, Cooch Behar, West Bengal, India.

67. Participated in the Webinar on *“Tropical Parasites and their Treatments”* on 16.07.2020 through online video conferencing; organized by the Mizoram University, Aizawl, India.

68. Participated in One Day Webinar on *“Recent Trends in Science and Technology”* on 17th July, 2020, through online Google Meet; jointly organized by the Department of Botany, Chemistry, Physiology and Zoology & Internal Quality Assurance Cell (IQAC), Netaji Nagar Day College, affiliated to the University of Calcutta, West Bengal, India.

69. Participated in the Webinar on *“Antibiotic Resistance”* on 17.07.2020 through online video conferencing; organized by the Mizoram University, Aizawl, India.

70. Participated in Two Days National Webinar on *“PLANT RESEARCH IN WELFARE OF HUMAN BEING”* on 17th & 18th July, 2020, through online Google Meet; jointly organized by the Department of Botany, South Calcutta Girls’ College & Dinabandhu Mahavidyalaya, West Bengal, India.

71. Participated in the National Webinar on *“EMERGING FRONTIERS IN BIOLOGICAL SCIENCES”* on July 20-21, 2020 through online video conferencing; jointly organized by the Department of Botany & Zoology, Manipur University, Canchipur, India.

72. Participated in the Webinar on *“Unexpected tough time in this pandemic time- will have to adapt to deal with it since it is what it is; given by Dr. Siddeswar Gubba, Ph.D., Innovative Informatics & Technologies, Inc., Texas, USA,”* on 21.07.2020 through online video conferencing; organized by the Mizoram University, Aizawl, India.

73. Participated in the National level Webinar on ***“THE ENIGMA OF COVID-19: FEATURES, GENOMIC PLASTICITY AND TREATMENT MODALITIES”*** on 22.07.2020 through online video conferencing; jointly organized by the Department of Botany & IQAC, Krishnagar Government College, Krishnagar, Nadia, West Bengal-741101, India.

74. Participated in the Webinar on ***“Peptide Nanoparticle and their Significance in Drug Development, delivered by Dr. Palanirajan Vijayara Kumar, UCSI University, Malaysia”*** on 23.07.2020 through online video conferencing; organized by the Department of Chemistry, Mizoram University, Aizawl, India.

75. Participated in the Webinars on ***“COVID-19 PANDEMIC IN INDIA: DIAGNOSTIC TOOLS AND NATIONAL REGULATIONS AND PATIENTS WITH CHRONIC LUNG DISEASES DURING THE COVID-19 PANDEMIC”*** on 24.07.2020 through online video conferencing; organized by the Mizoram University, Aizawl, India.

76. Participated in the International level Webinar on ***“THE COVID-19 PANDEMIC: MYTHS, SCIENCE AND HOPE”*** on 26.07.2020 through online video conferencing; jointly organized by the Department of Botany & IQAC, Krishnagar Government College, Krishnagar, Nadia, West Bengal-741101, India.

77. Participated in *International Colloquium (Online)* on ***“Science and Society: Institutional approaches during pandemic”*** on 30.07.2020 & 31.07.2020; organised by the Science Departments and IQAC, Dinhata College in collaboration with the Department of Botany, Cooch Behar Panchanan Barma University, West Bengal, India.

78. Participated in One Day National Webinar on ***“Digital Teaching during COVID-19 Pandemic with Special Reference to Teaching learning Process”*** on 03.08.2020, through online Google Meet; jointly organized by the Department of Education & IQAC, South Calcutta Girls' College, Kolkata, West Bengal, India.

79. Participated in the Webinar on 3rd August, 2020, organized by the Mizoram University, Aizawl, entitled ***‘An International Webinar on Biometric Recognition Techniques for Authentication in Smart Cities’*** delivered by Shi-Jinn Horng, Chair Professor, National Taiwan University of Science and Technology, Taipei, Taiwan-106.

80. Participated in the Webinar on 3rd August, 2020, organized by the Department of Horticulture, Faculty of Agriculture, Annamalai University, entitled ***“Annona- the super fruit of the 21st century”***.

81. Participated in the Webinar on 3rd August, 2020, jointly organized by the Central Library, Manipur University in collaboration with Springer Nature, entitled ***“ACADEMIC AND SCIENTIFIC WRITING CATAPULTING INSTITUTIONAL VISIBILITY”***.

82. Participated in One Day National Webinar on ***“Plant Through Ages: Extinct to Extant”*** held on August 4th, 2020; organized by the Department of Botany in association with IQAC of the Mrinalini Datta Mahavidyapith, Birati, Kolkata-700051.

83. Participated in the Webinar on *“Bench to Bedside: An overview of Drug Development Process, delivered by Dr. Prakash Bolleddula, Ph.D Director, DMPK and Clinical Pharmacology Agios Pharmaceuticals Cambridge, MA, USA”* on 04.08.2020 through online video conferencing; organized by the Department of Biotechnology, Mizoram University, Aizawl, India.

84. Participated in the Webinar on 4th August, 2020, organized by the Department of Horticulture, Faculty of Agriculture, Annamalai University, entitled *“Neutraceuticals in flower crops”*.

85. Participated in the Webinar on 5th August, 2020, organized by Proquest in collaboration with Annamalai University, entitled *“Best Practices in Using ProQuest Databases for Research, Teaching and Learning”*.

86. Participated in the Webinar on *“IMMUNOTHERAPY APPROACHES IN CANCER DRUG DISCOVERY”* on 05.08.2020 through online video conferencing; organized by the Mizoram University, Aizawl, India.

87. Participated in the Webinar on 6th August, 2020; on *“Understanding the Complexity of Cancer Progression and Biology of DNA Structures”*; organized by the Department of Botany in association with IQAC of Gurudas College.

88. Participated in the international web conference on 7th August, 2020; on *“Climate Change & Human Health”*; jointly organized by the Faculty of Science, Tufanganj Mahavidyalaya and the Department of Zoology, Ananda Chandra College.

89. Participated in ONE DAY NATIONAL LEVEL WEBINAR ON *“PROMOTION OF COLLEGE TEACHERS AND LIBRARIANS UNDER CARREAR ADVANCEMENT SCHEME (CAS)”* on 8th August, 2020; organised by IQAC, Alipurduar College as per registration Ref. No. APDC/IQAC/2020/069.

90. Participated in One Day International Webinar on *“Corona Virus Disease (COVID-19): A review of It's Pathophysiology and Epidemiology”* on 9th August, 2020; organized by the Department of Food and Nutrition, Tara Devi Harakh Chand Kakaria Jain College, Affiliated to University of Calcutta.

91. Participated in Webinar On *“Personalized Precision Cancer Therapy”* On 13 Aug 2020.

92. Participated in the *One Day International Webinar on “Viral infection and immunity: physiological aspects and preventive strategy”* on 14th August, 2020; organized by the Department of Physiology in association with IQAC, Belda College, Belda, W.B.

93. Participated in the Online Lecture Series entitled *“Virtual Journey Through Botanical World”* held from 12th-15th of August, 2020, organized by the Department of Botany in association with IQAC, T.H.K Jain College, Kolkata.

94. Participated in the Bilateral Indo-US Webinar on *COVID Biology*, dated August 16-19, 2020; organized by Indian Institute of Science education and Research Kolkata, India in collaboration with IISc, Bangalore, India, University of Pennsylvania, and the University of Colorado, School of Medicine, USA.

95. Participated in the **National Webinar on “Plant Science in New Era, Part-I”** on **19.08.2020**; organized by the **Department of Botany, Kabi Nazrul College, Murarai, Birbhum.**

96. Participated in **One Day National Level Webinar on “The New Horizon: Omics in Microbial Research”** on **22.08.2020**; organized by the **Department of Botany, Kalimpong College, Kalimpong.**

97. Participated in the **International Webinar on “Neoteric Approaches in Applied Sciences”** jointly organized by **UG & PG Department of Botany and Department of Physics** in collaboration with **IQAC, Darjeeling Government College** on **24th and 25th August, 2020.**

98. Participated in **One Day National Level Webinar on “Jal Shakti Campus and Jal Shakti Gram: SDGs for Natural Resources During COVID-19 and Beyond”** on **25.08.2020**; jointly organized by **NSS & IQAC, Maynaguri College** in collaboration with **Mahatma Gandhi National Council of Rural Education (MGNCRE).**

99. Participated in **One day International Webinar on “Science, Biology and the world’s Future”** on **25.08.2020**; organized by the **Department of Botany** in collaboration with **Internal Quality Assurance Cell (IQAC), Dinabandhu Andrews College, Kolkata.**

100. Participated in the **National Webinar on “National Education Policy 2020”** on **26.08.2020**; organized by the **Department of Education, Mizoram University, Aizawl.**

101. Participated in the **International Webinar on “IPR and Recent Advancement in Pharmaceutical Research”** held on **29th August 2020**; organized by the **Department of Pharmaceutical Technology, University of North Bengal, Raja Rammohunpur, Darjeeling 734013, West Bengal, India.**

102. Participated in the **One-day State Level Webinar on “Emerging Bio-based Industrial Sectors & Job Prospects: Indian Scenario with Special Reference to West Bengal”** organized by **UG & PG Department of Botany** in collaboration with **IQAC, Darjeeling Government College** on **30th August, 2020.**

103. Participated in the **International Webinar on “COVID-19 Pandemic and Co-infections: Challenges, Prospective Treatments and Societal Impact”** held on **31st August, 2020**, organized by the **Department of Microbiology, Raiganj University.**

104. Participated in the **Inaugural Talk of Bio-Illumination on “Present trends and future prospects of herbal medicines”** held on **05.09.2020**, organized by the **Department of Biological Sciences, Aliah University, Kolkata.**

105: Participated in the **ONE-DAY NATIONAL WEBINAR ON “ROLE OF INDIGENOUS TRADITIONAL KNOWLEDGE AND HERBAL DRUGS IN COMBATING AGAINST PANDEMIC COVID-19”** held on the **11th September, 2020**; organized by the **Department of Botany and Internal Quality Assurance Cell, Maulana Azad College, Kolkata.**

106. Participated in the **Bio-Illumination Talk** on “*Single Molecule Technologies: A New Window To See Complex Biological Phenomenon*” held on **12.09.2020**, organized by the Department of Biological Sciences, Aliah University, Kolkata.

107. Participated in the **Bio-Illumination Talk** on “*Applied Phytochemistry as an Interdisciplinary Research Concept*” held on **12.09.2020**, organized by the Department of Biological Sciences, Aliah University, Kolkata.

108. Participated in **One Day Webinar** on “*Biodiversity: Concept, Conservation and Challenges*” held on **13th September, 2020**; organized by the Department of Botany and Zoology in collaboration with IQAC, FAKIR CHAND COLLEGE, DIAMOND HARBOUR, SOUTH 24 PGS, WEST BENGAL, INDIA. (Certificate Id: IBJT0E-CE000112).

109. Participated in the **Bio-Illumination Talk** on “*Host-pathogen interaction: Crosstalk between nuclear DNA sensor. IFI16 and Herpesvirus*” held on **19.09.2020**, organized by the Department of Biological Sciences, Aliah University, Kolkata.

110. Participated in **INDIAN PHYTOPATHOLOGICAL SOCIETY, NEW DELHI- IPS WEBINAR SERIES** on **INTERNATIONAL YEAR OF PLANT HEALTH 2020- IPS Webinar of Central Zone** on July 17, 2020.

111. Participated in **DBT Sponsored Webinar** on “*Beginners’ Bioinformatics*”; organised by the Department of Botany, Jhargram Raj College on **24th September, 2020**.

112. Participated in the **Bio-Illumination Talk** on “*Flooding of Pulmonary Alveoli (edema) in COVID-19: The Pathophysiology*” held on **26.09.2020**, organized by the Department of Biological Sciences, Aliah University, Kolkata.

113. Participated in the **Bio-Illumination Talk** on “*VENOM-SELEX: An aptamer based method for identification of biomarker for differential detection of snake venom*” held on **03.10.2020**, organized by the Department of Biological Sciences, Aliah University, Kolkata.

114. Participated in **DBT Sponsored Webinar** on “*Bio Energy & Energy Conservation*”; organised by the Department of Botany, Jhargram Raj College on **2nd October, 2020**.

115. Participated in **online Webinar** on “*Next Generation Sequencing For Deciphering Host-Pathogen Interactions*” on **4th and 5th February, 2021**; jointly organized by the Indian Phytopathological Society (IPS) and Bionivid Technology Pvt. Ltd.

116. Participated in **online Webinar** on “*Biodiversity Day*” on **22nd May, 2021**; jointly organized by Shakti Manipur and Society for Environmental Education and Development (SEED), Manipur.

117. Participated in **online State level Webinar** on “*Mucormycosis: The Black Fungus infection maiming COVID-19 patients in India*” on **03.06.2021**; organized by the Government General Degree College, Chapra.

118. Participated in **online one day Webinar** on “*Observation of World Environmental Day*” on **05.06.2021**; organized by the **Government General Degree College, Chapra**.

119. Participated in **online one day National Webinar** on “*THINK GREEN, LIVE GREEN*” commemorating the VAN-MAHOTSAV WEEK, on **07.07.2021**, jointly organized by the IQAC and PG Department of Conservation Biology, Durgapur Government College.

120. Acted as **ONE OF THE JOINT ORGANIZING SECRETARIES** in **online one day webinar** (**SIR J.C.BOSE MEMORIAL LECTURE SERIES, 2021- 1ST RGUBOT WEBINAR SERIES-1**) ON “*Metagenomics in Microbial Ecology: Microbial Community Structure and its Functional Implications*” on **11.08.2021**; organized by the Department of Botany, Raiganj University.

121. Acted as **ONE OF THE JOINT ORGANIZING SECRETARIES** in **online one day webinar** (**SIR J.C.BOSE MEMORIAL LECTURE SERIES, 2021- 2nd RGUBOT WEBINAR SERIES-2**) ON “*Think outside the box: Be an Entrepreneur!*” on **24.08.2021**; organized by the Department of Botany, Raiganj University.

122. Acted as **ONE OF THE JOINT ORGANIZING SECRETARIES** in **online one day webinar** (**SIR J.C.BOSE MEMORIAL LECTURE SERIES, 2021- 3rd RGUBOT WEBINAR SERIES-3**) ON “*Taxonomy-What, Why and How??*” on **18.09.2021**; organized by the Department of Botany, Raiganj University.

123. Participated and presented an abstract entitled “*UNRAVELLING THE BENEFICIAL TRAITS OF PGPR FOR GROWTH ENHANCEMENT AND DISEASE MANAGEMENT IN TEA PLANTATION- A. P. Chakraborty**, U. Chakraborty, B.N.Chakraborty” in **online Two days National Seminar-“ADVANCEMENT OF PLANT SCIENCES FOR FOOD DIVERSITY AND NUTRITIONAL SECURITY”** ; jointly organized by the Department of Botany and UGC-HRDC center, University of North Bengal from **30.09.2021-01.10.2021**.

124. Participated and presented an abstract entitled “*HARNESSING THE ROLE OF ORCHIDOID MYCORRHIZAE AND MYCOBIONTS IN STIMULATING GERMINATION OF ORCHID SEEDS AND SUPPRESSION OF DISEASE OF ORCHID PLANTS- Oindrila Chakraborty¹, Dinesh Kumar Agrawala² and Arka Pratim Chakraborty^{3*}*” in **online Two days National Seminar-“ADVANCEMENT OF PLANT SCIENCES FOR FOOD DIVERSITY AND NUTRITIONAL SECURITY”** ; jointly organized by the Department of Botany and UGC-HRDC center, University of North Bengal from **30.09.2021-01.10.2021**.

125. Participated and presented an abstract entitled “*ENDOPHYTIC ACTINOMYCETES AS PLANT GROWTH PROMOTERS AND BIOCONTROL AGENTS- Sumi Paul¹, Arka Pratim Chakraborty^{2*}*” in **online Two days National Seminar-“ADVANCEMENT OF PLANT SCIENCES FOR FOOD DIVERSITY AND NUTRITIONAL SECURITY”** ; jointly organized by the Department of Botany and UGC-HRDC center, University of North Bengal from **30.09.2021-01.10.2021**.

126. Evaluator in Poster Session in **Two Days National Seminar (Online Mode)** on *Advancement of Plant Sciences for Food Diversity and Nutritional Security*, organized by the **Department of Botany, University of North Bengal** in collaboration with **UGC-Human Resource Development Center, University of North Bengal** on **30.09.2021**.

127. Abstract (A-23) entitled “First evidence of *Curvularia lunata* (ON246070) causing leaf spot disease of banana from Sarai, Raiganj, Uttar Dinajpur District, West Bengal, India” by Papan Chowhan and **Arka Pratim Chakraborty**, Department of Botany, Raiganj University, Raiganj was presented during *one day seminar on “Science and Technology”, organized by the University of Gour Banga, Malda in collaboration with District Science & Technology and Biotechnology, Malda on 07.07.2022.*

128. Abstract entitled- New report of root endophyte- *Enterobacter cloacae* (ON955844) having *in vitro* growth promoting attributes and biocontrol potential against *Curvularia lunata* (ON246070) causing leaf spot disease of banana by **Arka Pratim Chakraborty**, Papan Chowhan, Shambhu Swarnakar was presented (**Oral**) during *APMAS-2023 NBU International Seminar from 2-4 March, 2023*, organized by the Department of Botany, NBU.

129. Abstract entitled- Diversity and distribution of five sub-tribes Gastrochilinae, Aeridinae, Diplocentrinae, Pelatantheriinae and Taeniophyllinae under tribe Vandaeae (Orchidaceae) in India by Oindrila Chakraborty, Dinesh Kumar Agrawala, **Arka Pratim Chakraborty** was presented (**Oral**) during *APMAS-2023 NBU International Seminar from 2-4 March, 2023*, organized by the Department of Botany, NBU.

130. Abstract entitled- Harnessing the role of root endophytic bacterium- *Achromobacter xylosoxidans* (ON955872) having *in vitro* growth promoting attributes and its role as antagonist against *Curvularia lunata* (ON246070) causing leaf spot disease of banana from Raiganj, Uttar Dinajpur, West Bengal by Papan Chowhan, **Arka Pratim Chakraborty** was presented (**Oral**) during *APMAS-2023 NBU International Seminar from 2-4 March, 2023*, organized by the Department of Botany, NBU.

131. Abstract entitled- Yellow leaf disease of *Brassica juncea* by *Fusarium equiseti* (ON783721) by Shambhu Swarnakar, **Arka Pratim Chakraborty**, was presented (**Oral**) during *APMAS-2023 NBU International Seminar from 2-4 March, 2023*, organized by the Department of Botany, NBU.

132. Abstract entitled- *Priestia flexa* (OP541862)- a phosphate solubilizing and IAA producing actinobacterium from the rhizosphere of *Oryza sativa* showing *in vitro* antagonism against *Bipolaris oryzae* (OP541600) by Sumi Paul, **Arka Pratim Chakraborty**, was presented (**Oral**) during *APMAS-2023 NBU International Seminar from 2-4 March, 2023*, organized by the Department of Botany, NBU.

133. Abstract entitled- Studies on morphological variabilities among the isolates of leaf pathogens isolated from diseased leaves of *Musa paradisiaca* from Uttar Dinajpur District by Debarati Das, Papan Chowhan, Tanmoy Das, Parimal Mandal, **Arka Pratim Chakraborty** was presented (**Poster**) during *APMAS-2023 NBU International Seminar from 2-4 March, 2023*, organized by the Department of Botany, NBU.

134. Co-Chairperson in Technical Oral Session-I in *APMAS-2023 NBU International Seminar from 2-4 March, 2023*, organized by the Department of Botany, NBU.

135. Abstract entitled- Unraveling the *in vitro* Plant Growth Promoting (PGP) traits of one potent PGPR- *Bacillus pumilus* and its biocontrol potential against *Fusarium equiseti* causing yellow leaf disease of *Brassica juncea* by Shambhu Swarnakar, **Arka Pratim Chakraborty**, Papan Chowhan was presented (**Oral**) during 1st Botanical Congress 2023 organised by the Department of Botany, University of Calcutta, during 23-25th March, 2023.

136. Participated in two day's workshop on **29th and 30th January, 2024** on National Education Policy-2020 and development of curriculum framework at Higher Educational Institutions; jointly organized by the Committee for special campaign 3.0, Swachhata hi Sewa and mainstreaming of mission of life in assistance with IQAC, Raiganj University, Uttar Dinajpur, West Bengal.

137. Participated in awareness campaign on office administration and maintenance of records following the Standard Operating Procedure (SOP) for Higher Education Institutes (HEIs), **on 25.01.2024**, organized by the committee for special campaign 3.0. Swachhata hi Sewa and mainstreaming mission life, Raiganj University.

138. Presented poster on the topic entitled *Achromobacter xylosoxidans* a potent phosphate solubilizing, iaa producing endophyte showing antagonism against *Curvularia lunata* causing leaf spot disease of banana- Papan Chowhan, **Arka Pratim Chakraborty** in **2nd Botanical Congress, 2024**, held at the Department of Botany, University of Burdwan in collaboration with Botanical Society of Bengal on **March 23-24, 2024**.

139. Got the best poster presentation award by Papan Chowhan, Arka Pratim Chakraborty for the poster presentation on the topic entitled *Achromobacter xylosoxidans* a potent phosphate solubilizing, iaa producing endophyte showing antagonism against *Curvularia lunata* causing leaf spot disease of banana- Papan Chowhan, **Arka Pratim Chakraborty** in **2nd Botanical Congress, 2024**, held at the Department of Botany, University of Burdwan in collaboration with Botanical Society of Bengal on **March 23-24, 2024**.

140. Presented poster on the topic entitled *In vitro* antagonistic activity of *Priestia flexa* against *Aspergillus niger* causing leaf disease of *Oryza* - Sumi Paul, **Arka Pratim Chakraborty** in **2nd Botanical Congress, 2024**, held at the Department of Botany, University of Burdwan in collaboration with Botanical Society of Bengal on **March 23-24, 2024**.

141. Presented oral on the topic entitled *Bacillus pumilus* a potent phosphate solubilizing, iaa producing PGPR showing antagonism against *Fusarium equiseti* causing yellow leaf disease of *Brassica juncea*- Shambhu Swarnakar, **Arka Pratim Chakraborty** in **2nd Botanical Congress, 2024**, held at the Department of Botany, University of Burdwan in collaboration with Botanical Society of Bengal on **March 23-24, 2024**.

142. Presented poster on the topic entitled *Curvularia lunata* and *Aspergillus niger*- leaf spot causing pathogens of *Musa paradisiaca* from Uttar Dinajpur and new insights into the roles of entophytic bacteria as potent antagonists against the pathogens Papan Chowhan, **Arka Pratim Chakraborty** in the **National Conference** on Expanding the Horizons of Microbial Research in Agriculture , **June 10-11, 2024**, jointly organized by ICAR-NBAIM and Association for conservation of Microbes and Application (ACMA)

143. Participated as a Resource Person and delivered a lecture entitled "Deciphering the Beneficial Roles of Mushrooms in Daily Life, Cultivation Techniques and Nutritional Values of Mushrooms" in the "Value Added Course on Mushroom Cultivation" from 5th June, 2024 to 15th June, 2024, organized by the Department of Botany in Collaboration with IQAC, Balurghat College

144. Acted as **ONE OF THE JOINT ORGANIZING SECRETARIES** in **National Seminar** on "Current trends in plant and microbial research for crop and crop health management" jointly organized by the Indian Phytopathological Society and the Department of Botany, Raiganj University **on September 06, 2024**.

145. Participated and presented work in poster session- abstract entitled “*Curvularia lunata*- a leaf spot causing pathogen of *Musa paradisiaca* and *Enterobacter cloacae*- a potent endophyte showing antagonism against *C. lunata*” by Papan Chowhan and **Arka Pratim Chakraborty** in **National Seminar on “ Current trends in plant and microbial research for crop and crop health management”** jointly organized by the Indian Phytopathological Society and the Department of Botany, Raiganj University **on September 06, 2024.**

146. Participated and presented work in poster session- abstract entitled “A potent antagonist against *Bipolaris oryzae* and *Aspergillus niger* -*Bacillus licheniformis* having in vitro plant growth promoting attributes” by Sumi Paul and **Arka Pratim Chakraborty** in **National Seminar on “ Current trends in plant and microbial research for crop and crop health management”** jointly organized by the Indian Phytopathological Society and the Department of Botany, Raiganj University **on September 06, 2024.**

147. Participated and presented work in poster session- abstract entitled “Orchids as an important crop in floriculture industry” by Oindrila Chakraborty, Dinesh Kumar Agrawala, **Arka Pratim Chakraborty** in **National Seminar on “Current trends in plant and microbial research for crop and crop health management”** jointly organized by the Indian Phytopathological Society and the Department of Botany, Raiganj University **on September 06, 2024.**

148. Participated and presented work in oral session under theme III- Microbiome for Sustainable Plant Health Improvement- abstract entitled “DECIPHERING THE BENEFICIAL ROLES OF POTENT ROOT ENDOPHYTIC BACTERIA, PGPR AND ACTINOMYCETES AS PLANT GROWTH PROMOTERS AND BIOCONTROL AGENTS” by **Arka Pratim Chakraborty** in **NATIONAL CONFERENCE ON UTILIZATION OF MICROBIOME FOR SUSTAINABLE PLANT HEALTH AND LIVELIHOOD**; organized by **the Indian Mycological Society from Dec 6-8, 2024.**

149. Participated and presented work in oral session under theme II- Plant-Microbe Interactions- abstract entitled “STUDIES ON ROOT ENDOPHYTIC BACTERIA- *Achromobacter xylosoxidans* AND *Enterobacter cloacae* AS PLANT GROWTH PROMOTERS AND BIOCONTROL AGAINST *Curvularia lunata* AND *Aspergillus niger* CAUSING LEAF SPOT DISEASES OF *Musa paradisiaca*” by Papan Chowhan, **Arka Pratim Chakraborty** in **NATIONAL CONFERENCE ON UTILIZATION OF MICROBIOME FOR SUSTAINABLE PLANT HEALTH AND LIVELIHOOD**; organized by **the Indian Mycological Society from Dec 6-8, 2024.**

150. Participated and presented work in poster session under theme II- Plant-Microbe Interactions- abstract entitled “*Bacillus thuringiensis*- a POTENT PHOSPHATE SOLUBILIZING, IAA PRODUCING PGPR SHOWING *IN VITRO* ANTAGONISM AGAINST *Fusarium equiseti* CAUSING YELLOW LEAF DISEASE OF *Brassica juncea*” by Shanbhu Swarnakar, **Arka Pratim Chakraborty** in **NATIONAL CONFERENCE ON UTILIZATION OF MICROBIOME FOR SUSTAINABLE PLANT HEALTH AND LIVELIHOOD**; organized by **the Indian Mycological Society from Dec 6-8, 2024** and got **2nd prize.**

151. Participated and presented work in oral session under theme III- Microbiome for Sustainable Plant Health Improvement- abstract entitled “UNRAVELING THE ROLE OF A POTENT ACTINOBACTERIUM- *Streptomyces macrosporeus* AS PLANT GROWTH PROMOTER HAVING *IN VITRO* ANTAGONISTIC POTENTIAL AGAINST *Bipolaris oryzae* AND *Aspergillus niger* CAUSING BROWN SPOT AND LEAF SPOT DISEASES OF RICE” by Sumi Paul, **Arka Pratim Chakraborty** in **NATIONAL CONFERENCE ON UTILIZATION OF MICROBIOME FOR SUSTAINABLE PLANT HEALTH AND LIVELIHOOD**; organized by **the Indian Mycological Society from Dec 6-8, 2024.**

152. Participated and acted as Rapporteur in the session under the theme VIII. Environmental Stress alleviation through microbes in NATIONAL CONFERENCE ON UTILIZATION OF MICROBIOME FOR SUSTAINABLE PLANT HEALTH AND LIVELIHOOD; organized by the Indian Mycological Society from **Dec 6-8, 2024.**

153. Participated and presented work in oral session under the discipline Botany- abstract entitled “First Evidences Of Leaf Spot Diseases Of Musa paradisiaca by Aspergillus niger And Curvularia lunata, Reported From Ramganj And Sarai Of Uttar Dinajpur District” by Papan Chowhan*, Arka Pratim Chakra borty in 7th Regional Science and Technology Congress(Region 2), at Malda College in collaboration with the Department of Science and Technology and Biotechnology, Government of West Bengal, during January 7- 8, 2025.

Professional Memberships

Life Member

1. Asian PGPR Society (ASPS)
2. Association of Microbiologists of India (AMI)
3. Indian Mycological Society (IMS)
4. Indian Phytopathological Society (IPS)
5. National Academy of Molecular Biology and Genetics (NAMBAG),
Biswa Bangla Genome Center (BBGC), University of North Bengal
6. Selected as Fellow of the Indian Mycological Society- FIMS in the year 2024 and fellow was declared in the AGM meeting of the Society that was held on 26th July, 2024.

Member

1. North Bengal University Alumni Association (NBUAA- Reg. No.- S/IL/7445 of 2001-02) w.e.f. **05.12.2019**.
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Manuscript Reviewer for Scientific Journals

1. 2020: AS REVIEWER IN THE REVIEWER & EDITORIAL BOARD MEMBER COMMITTEE OF THE JOURNAL- “INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS-IJCRT- ISSN- 2320-2882”

NAME: Dr. ARKA PRATIM CHAKRABORTY

Reviewer Profile ID: 115845

Education qualification: Ph.D.

Designation: ASSISTANT PROFESSOR, RAIGANJ UNIVERSITY

Subject: Research Interest: Microbiology, Plant Pathology, Biological Science

IJCRT- REVIEWER since 31st MARCH, 2020 (www.ijcrt.org)

2. 2020: AS REVIEWER IN THE REVIEWER & EDITORIAL BOARD MEMBER COMMITTEE OF THE JOURNAL- “INTERNATIONAL JOURNAL OF ENGINEERING DEVELOPMENT AND RESEARCH-IJEDR- ISSN- 2321-9939”

Reviewer Profile ID: 115845

IJEDR- REVIEWER since 31st MARCH, 2020 (www.ijedr.org)

3. 2020: AS REVIEWER IN THE REVIEWER & EDITORIAL BOARD MEMBER COMMITTEE OF THE JOURNAL- “INTERNATIONAL JOURNAL OF RESEARCH AND ANALYTICAL REVIEWS-IJRAR-E- ISSN- 2348-1269; P-ISSN-2349-5138”

Reviewer Profile ID: 115845

IJRAR- REVIEWER since 31st MARCH, 2020 (www.ijrar.org)

4. 2020: AS REVIEWER IN THE JOURNAL- INTERNATIONAL JOURNAL OF TEA SCIENCE (IJTS)- JOURNAL ACRONYM (ISSN): IJTS (0972-544X)- <http://teascience.in/index.php/ijts>

5. 2020, 2021, 2022: AS REVIEWER IN THE JOURNAL- ARCHIVES OF PHYTOPATHOLOGY AND PLANT PROTECTION- TAYLOR & FRANCIS GROUP-Print ISSN: 0323-5408 Online ISSN: 1477-2906.

6. 2020, 2021: AS REVIEWER IN THE JOURNAL-JOURNAL OF TROPICAL LIFE

SCIENCE- UGC-CARE list journal- E-ISSN:2527-4376, ISSN: 2087-5517.

7. 11/01/2021-11/01/2029: AS REVIEWER IN THE JOURNAL- Advances in Zoology and Botany- UGC-CARE list journal- Horizon Research Publishing (USA)- ISSN-2331-5083.

8. 2022- AS REVIEWER IN JOURNAL OF PLANT GROWTH REGULATION SPRINGER JOURNAL Electronic ISSN 1435-8107; Impact factor: 4.640

Editor in magazine Agriculture & Food: e-Newsletter

1. As an editor in magazine Agriculture & Food: e-Newsletter from 03.09.2020 to 03.09.2022.

Agriculture & Food: e-Newsletter

www.agrifoodmagazine.co.in

ISSN: 2581 8317

- Article published in online magazine Agriculture & Food: e-Newsletter- Volume 2 Issue 10, October 2020- Microbial Induced Calcite Precipitation (MICP) and its Application in Self-Healing Concrete- Article ID: 32056.
- Book Review of Horror, Loss & Hope: The Emperor of All Maladies Article ID: 12116; Volume 3 - Issue 10, October 2021.

❖ 2021- Editorial Board member of the journal- International journal of Botany Studies (Web of Science)- ISSN: 2455-541X

❖ 2021- Editorial Board member of the journal- International Research Journal of Plant Science- ISSN-2141-5447, UGC CARE LISTED

2. Science REPORTER

Vol. 58 No. 5 May 2021 ISSN: 2582-6492 (Online) ISSN 0036-8512 (Print)

National Institute of Science Communication and Information Resources (NISCAIR)

Council of Scientific & Industrial Research (CSIR)

Article published in online magazine- May issue 58(05): 44-46, 2021

Microgreens: Food for the Future

Sourav Dey & Arka Pratim Chakraborty

Editorial Advisory Member

1. As one of the Editorial Advisory Member in the UGC-CARE list journal- *Journal of Advanced Scientific Research* (ISSN- 0976-9595) under *ScienSage* publishing house.



2. EDITORIAL MEMBER IN Kripa-Drishti Publications

A-503 Poorva Heights, Pashan-Sus Road, Near Sai Chowk, Pune – 411021, Maharashtra, India.

Mob: +91-8007068686

Email: editor@kdpublishations.in

Workshops attended (2006-2024)

1. A two day training workshop on cultivation of Medicinal Plants jointly organised by the Department of Adult, Continuing Education and Department of Botany, NBU.
2. **WORKSHOP-National workshop on Bioinformatics held from 18- 20th January, 2008**, Bioinformatics Facility, Department of Botany, North Bengal University.
3. **WORKSHOP-UGC sponsored Research Scholar's Training from 30-06-2011 to 01-07-2011**, North Bengal University.
4. One day user awareness programme on "*Access to E-resources under N-LIST Programme*", organized by University Library, NBU in collaboration with the INFLIBNET Centre, Ahmedabad (An Inter-University Centre of UGC) held on **10th February, 2012** at University of North Bengal.
5. One day workshop on "*Cultivation and post-harvest processing of edible mushrooms*", organised by the Department of Botany, NBU in collaboration with Uttar Banga Krishi Viswavidyalaya, Coochbehar under the project entitled "*Establishment of rural bioresource complex in North Bengal*" on **December 29, 2014**.
6. Three days workshop on "*Exploitation of Plant and Microbial resources of North Bengal* ", organised by the Department of Botany, NBU during **December 14-16, 2015**.
7. One day workshop entitled **PGPRs for sustainable crop productivity** organized by the Indian Phytopathological Society in the 6th International Conference on Plant, pathogens and People with the mission Challenges in Plant Pathology to benefit humankind, held at NASC Complex, New Delhi on **February 25, 2016**.
8. One day workshop cum seminar on "*Bioresource Utilization*" organized by Department of Botany, NBU in collaboration with Uttar Banga Krishi Viswavidyalaya, Coochbehar under the project entitled "*Establishment of rural bioresource complex in North Bengal*" on **September 05, 2016**.
9. Attended and as joint organizing secretary organized "**ONE DAY WORKSHOP CUM HANDS ON TRAINING ON BIOINFORMATICS**" at the premises of Gyan Jyoti College on **September 28, 2018** in joint collaboration with the Department of Botany, Gyan Jyoti College and NBU-Bioinformatics Centre, NBU, Siliguri.
10. Participated in **ONE DAY SEMINAR CUM WORKSHOP ON "EXPLORING THE HISTORY OF DEVELOPMENT OF INDIAN SCIENCE IN THE LATE COLONIAL ERA"**, held on **September 16, 2019** in joint collaboration with Gyan Jyoti College and North Bengal Alumni Association (NBAAA), a registered society bearing Reg. No.- (S/IL/7445 of 2001-02).
11. Participated in **ONE DAY WEB-BASED WORKSHOP ON "QUALITATIVE RESEARCH AND ACADEMIC WRITING"**- QRAW- SERIES-1; held on **27.07.2020**; organized by the Department of Library & Information Science, Manipur University, Canchipur, India.
12. Participated in the **THREE DAY NATIONAL LEVEL e-WORKSHOP on "MOLECULAR VISUALIZATION AND MODELING USING PYTHON PROGRAMMING"** held from **10th to 12th August, 2020**; jointly organized by the Departments of Physics, Microbiology & Zoology, Maulana Azad College (DBT Star College Programme), Kolkata.
13. Participated in Emerald Publishing's workshop on "*Accessing indexed journals for*

quality research” on 12th August, 2020; conducted by Annamalai University, Tamil Nadu in association with Emerald Publishing, India.

14. Participated in **ONLINE QUIZ CELEBRATING INDIAN INDEPENDENCE DAY (15th August, 2020)**; jointly organized by the All NSS Units and IQAC, Maynaguri College, University of North Bengal.

15. Participated in **ONLINE QUIZ CELEBRATING INDIAN INDEPENDENCE DAY (15th August, 2020)** on “*People & their art, culture & heritage*”; organized by the All NSS Units, Bangabasi Morning College, Kolkata. (Certificate Id- A1PN9A-CE000351).

16. Participated in **One Day Orientation Programme on NAAC & CAS on 23.08.2020**; organized by IQAC, Malda College, Malda.

17. Participated in the online **International Lecture Series** organized by IQAC and Department of Botany, Government General Degree College, Singur from 4th August, 2020 to 31st August, 2020.

18. Participated in awareness campaign on office administration and maintenance of records following the Standard Operating Procedure (SOP) for Higher Education Institutes (HEIs), on 25.01.2024, organized by the committee for special campaign 3.0. Swachhata hi Sewa and mainstreaming mission life, Raiganj University.

19. Participated in two day’s workshop on 29th and 30th January, 2024 on National Education Policy- 2020 and development of curriculum framework at Higher Educational Institutions; jointly organized by the Committee for special campaign 3.0, Swachhata hi Sewa and mainstreaming of mission of life in assistance with IQAC, Raiganj University, Uttar Dinajpur, West Bengal.

20. Participated in workshop entitled “*Agriculture in Digital Era*” of NAAS-PAAS, organized by the Indian Mycological Society, Kolkata in collaboration with National Academy of Agricultural Sciences (Kolkata Chapter) and Department of Botany, University of Calcutta, held on August 24, 2024.

Academic Staff College Orientation/ Refresher Course attended during the year 2022, 2023

| Name of the Course/Summer School | Place | Duration | Sponsoring Agency |
|---|--|---|--------------------------------|
| Faculty Induction Program (FIP-09) at NBU-HRDC | UGC-HUMAN RESOURCE DEVELOPMENT CENTRE UNIVERSITY OF NORTH BENGAL RAJA RAMMOHUNPUR, DARJEELING | 30 days 18.07.2022 To 18.08.2022 | UGC AND NBU HRDC CENTRE |

| | | | |
|---|---|--|--|
| <p>NEP-2020 at NBU-HRDC ONE DAY WEBINAR ON 12.09.2022 FROM 2.30 PM TO 4 PM THROUGH GOOGLE MEET</p> | <p>UGC-HUMAN RESOURCE DEVELOPMENT CENTRE UNIVERSITY OF NORTH BENGAL RAJA RAMMOHUNPUR, DARJEELING</p> | <p>12.09.2022 FROM 2.30 PM TO 4 PM</p> <p>Virtual Mode</p> | <p>UGC AND NBU HRDC CENTRE and HRDC CENTRE, CALCUTTA UNIVERSITY</p> |
| <p>Refresher Course (RC) in Emerging Dimensions in Biological Sciences at NBU MMTTC- UGCHRDC</p> | <p>NBU MMTTC-UGCHRDC UGC-HUMAN RESOURCE DEVELOPMENT CENTRE UNIVERSITY OF NORTH BENGAL RAJA RAMMOHUNPUR, DARJEELING</p> | <p>15 days 24.11.2023 to 08.12.2023</p> | <p>UGC AND NBU MMTTC-UGCHRDC Centre</p> |