Curriculum Vitae

Mst Momtaj Begam, M. Sc., Ph. D

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D/O: Md Samsul Hoque
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Major Teaching Interests

- Plant Physiology and biochemistry
- Plant Biotechnology
- Plant Molecular Biology
- Plant Ecology
- Plant Developmental Biology

Major Research Areas

- Identification of species-specific adaptive features of different mangroves.
- Study in loss of mangrove homeostasis and its mechanism in degraded mangrove ecosystem and bio-restoration of a degraded mudflat.
- Identification of specific biochemical markers to distinguish between degraded and non-degraded mangrove habitat and molecular study of these characters in terms of expression level.
- Study the impacts of salinity stress on mangroves in terms of osmolytes accumulation and explored the modulation of osmolytes, anti-oxidative defense and photosynthetic performance of mangroves exposed to highly saline environment, tidal water logging, strong wind velocity, high temperature and muddy anaerobic soil.
- Identification of microbes, soil biogeochemistry, microbial diversity in soil, soil enzyme activity and analysis of different parameters of water and soil.

Educational qualifications (chronologically starting from Secondary Examination)

Examinations Passed	Board/ University	Year of Passing	Class or Division	Subjects studied
Secondary	West Bengal Board of Madrasah Education	2005	1st	Bengali, English, Mathematics, Physical Science, Life Science, History, Geography, Arabic
Higher Secondary	West Bengal Council of Higher Secondary Education	2007	2nd	Bengali, English, Biological Sciences, Chemistry, physics, Economic Geography, Environmental Education
B.Sc. (Hons.) in Botany	University of Calcutta	2010	2nd	Botany, Chemistry, Zoology, Environmental Studies, English, Bengali
M.Sc. in Botany	West Bengal State University	2012	1st	Lower Plant Groups, Evolution & Genetics, Biochemistry & Biophysics, Molecular Biology & Microbiology, Cell Biology & Immunology, Basic mathematics, Statistics & Computer for Biologist, Plant Systematics & Plant Resources Utilization, Plant Ecology & Environmental biology, Pteridophytes, Gymnosperms, Paleobotany & Palynology, Plant Pathology & Crop Protection, Molecular & Cellular Genetics, Plant Breeding & Biostatistics, Plant Physiology & Biochemistry, Plant Developmental Biology & Anatomy, Plant Molecular Biology, Advanced Plant Physiology & Biochemistry, Plant Molecular Biology.

Doctor of Philosophy (Ph.D.)

- **Subject:** Botany (Dept. of Botany, West Bengal State University)
- **Specialization:** Eco-Physiology**,** Molecular Biology & Biochemistry
- **Title of the thesis:** Study of eco-physiology and molecular mechanism of salinity stress tolerance in some mangrove associate species from Sundarban Mangrove Ecosystem of West Bengal.
- **Status: Awarded on 22/04/2019.**
- **Ph.D. Supervisor Dr Krishna Ray,** Assistant Professor Department of Botany, West Bengal State University, Barasat, West Bengal. E-mail: kray91@gmail.com
- **Joint Ph.D. Supervisor Dr. Sandip Kumar Basak,** Principal Sarat Centenary College, Dhaniakhali, Hooghly, West Bengal. E-mail: sandipbasak9592@gmail.com

Post-Doctoral Research Experiences

Post Held	Topic	Place of Posting	Time Period
Research Associate-I	Demonstration of established bio-restoration technology for ecological restoration of degraded mangrove ecosystem in Indian Sundarbans through site specific approach across differential degradations gradients'	West Bengal State University	From 14th July 2020 TO 30.11.2020
Senior Research Fellow (SRF)	Engaged in a Department of Biotechnology Govt. of India funded project entitled "An in-depth study of host-non-mulberry silkworm interaction with special reference to extra floral nectaries (EFN) and volatile organic chemicals (VOC) of host plants and the silkworm's adaptations to the host plant's defense response"	West Bengal State University	10.06.2019-31.10.2019

Award/Fellowship/Achievements

❖ Third in M.Sc. Botany from West Bengal State University-2012
❖ Maulana Azad National Fellowship (MANF) (UGC), Govt. of India: MANF Fellow as Junior Research Fellowship-2013
❖ Maulana Azad National Fellowship (MANF) (UGC), Govt. of India: MANF Fellow as Senior Research Fellowship-2015
❖ Topper in Research Entrance Test (RET) 2014, conducted by West Bengal State University
❖ JOINT CSIR-UGC NET Exam 2017 in LIFE SCIENCES
❖ GATE 2018 in LIFE SCIENCES: All India Rank: 2646, Score: 327

Technical Knowledge:

- **Centrifugation:** Preparative & Analytical: Differential; Rate Zonal; Density Gradient; Machine Operation.
- **Flame photometer:** Can operate Flame photometer machine.
- **Biochemical Assays:** Estimation of antioxidant enzyme and antioxidant molecule; H_2O_2 estimation; Proline estimation; Glycine betaine estimation, Total free amino acids estimation, Soluble sugars and Starch estimation, Free-inositol (myo-inositol) estimation. Assay of enzymes associated with nitrogen metabolism and photosynthate accumulating enzymes: enzymatic assay of glutamine synthetase, nitrate reductase and α amylase. Assay of photosynthetic carbon di-oxide assimilating enzymes: phosphoenolpyruvate carboxylase (PEPC), Ribulose 1, 5-bisphosphate carboxylase (RuBPC) enzyme assay. Photosynthetic pigments estimation, Sodium and Potassium (Na^+/ $K^{+)}$ estimation.
- **Microscopy:** Can operate Simple and Compound Microscope; Fluorescence microscopy; Photography: Camera operation, Digital Photography, Leaf Sample preparation for SEM.
- **Chromatography:** Thin Layer Chromatography (TLC).
- **Staining procedure:** Staining procedures for anatomical studies.
- **General Techniques:** Antioxidant enzyme- Native Protein Gel, Poly acrylamide gel electrophoresis (PAGE); Agarose gel electrophoresis; UV-visible spectrophotometry and Nanodrop spectrophotometry.
- **Experience in basic microbiology:** Sampling and analysis of soil and water for detection microbial activity. Analysis of soil enzyme activity. Pure colony establishment. Nutrient cycling media preparation and differential selection.
- **Genomics and Proteomics:** DNA, RNA isolation; Polymerase chain reaction (GRADIENT and NORMAL PCR); Real- time PCR.
- **Bioinformatics, Biostatistics and Computational Knowledge:** Basic bioinformatics with information technology- Primer designing software handling, Biological data analysis- SPSS, BLAST2GO software, Bio Edit software, MEGA software, MS-Word, Excel, XLSTAT, PowerPoint, Graph Pad Prism software, Sigma Plot software package, Photo scape software and Adobe packages. Operation and handling of different software used in biological research work.

Strengths

- Good skills to interact, quick learning and active listener.
- Dynamic to play a positive role in a challenging environment.
- Adaptive and flexible.
- Leading team and have problem solving capacity.
- Independently can design experiment.
- Ability to do molecular biological work, bio-informatics tools and biochemical assay independently

Publications: In peer reviewed journals

1. **Begam, M.,** Chowdhury, R., Sutradhar, T., Mukherjee, C., Chatterjee, K., Basak, S. and Ray, K., (2020). Forecasting mangrove ecosystem degradation utilizing quantifiable eco-physiological resilience -A study from Indian Sundarbans. **Scientific Reports (www.nature.com),** 10:6683. https://doi.org/10.1038/s41598-020-63586-4. **Impact factor: 3.998**

2. **Begam, M.,** Sutradhar, T., Chowdhury, R., Mukherjee, C., Basak, S. and Ray, K., (2017). Native salt-tolerant grass species for habitat restoration, their acclimation and contribution to improving edaphic conditions: a study from a degraded mangrove in the Indian Sundarbans. **Hydrobiologia (Springer),** 803:373-387. DOI: 10.1007/s10750-017-3320-2. **Impact factor: 2.325**

3. Chowdhury, R., Sutradhar, T., **Begam, M.,** Mukherjee, C., Chatterjee, K., Basak, S. and Ray, K., (2019). Effects of nutrient limitation, salinity increase, and associated stressors on mangrove forest cover, structure, and zonation across Indian Sundarbans. **Hydrobiologia (Springer),** 842:191-217. DOI: 10.1007/s10750-019-04036-9. **Impact factor: 2.325**

4. Mukherjee, C., Chowdhury, R., **Begam, M.,** Ganguli, S., Basak, R., Chaudhuri, B. and Ray, K., (2019). Effect of Varying Nitrate Concentrations on Denitrifying Phosphorus Uptake by DPAOs with a Molecular Insight into Pho Regulon Gene Expression. **Frontiers in Microbiology (Frontiers),** 10:2586. DOI: 10.3389/fmicb.2019.02586. **Impact Factor: 4.259**

5. Mukherjee, C., Chowdhury, R., Sutradhar, T., **Begam, M.,** Ghosh, S., Basak, S. and Ray, K., (2016). Parboiled rice effluent: A wastewater niche for microalgae and cyanobacteria with growth coupled to comprehensive remediation and phosphorus biofertilization. **Algal Research (Elsevier),** 19:225-236. DOI: 10.1016/j.algal.2016.09.009. **Impact factor: 4.008**

Publications in Newspaper

- https://www.thehindu.com/sci-tech/science/bio-restoring-degraded-patches-of-sunderbans/article29542941.ece
- https://www-thehindubusinessline-com.cdn.ampproject.org/v/s/www.thehindubusinessline.com/news/science/how-bio-restoration-is-helping-revive-degraded-mangroves-in-sunderbans/article29440448.ece/amp/?amp_js_v=a2&amp_gsa=1&usqp=mq331AQEKAFwAQ%3D%3D#aoh=15687321154675&referrer=https%3A%2F%2Fwww.google.com&amp_tf=From%20%251%24s&ampshare=https%3A%2F%2Fwww.thehindubusinessline.com%2Fnews%2Fscience%2Fhow-bio-restoration-is-helping-revive-degraded-mangroves-in-sunderbans%2Farticle29440448.ece
- https://vigyanprasar.gov.in/isw/bio-restoration-is-helping-revive-degraded-mangroves-in-Sunderbans.html

- https://www-downtoearth-org-in.cdn.ampproject.org/v/s/www.downtoearth.org.in/news/wildlife-&-biodiversity/amp/how-bio-restoration-is-helping-revive-degraded-mangroves-in-sunderbans-66782?amp_js_v=a2&amp_gsa=1&usqp=mq331AQEKAFwAQ%3D%3D#aoh=15687321716941&referrer=https%3A%2F%2Fwww.google.com&amp_tf=From%20%251%24s&ampshare=https%3A%2F%2Fwww.downtoearth.org.in%2Fnews%2Fwildlife-biodiversity%2Fhow-bio-restoration-is-helping-revive-degraded-mangroves-in-sunderbans-66782

Participation in Webinar

- Participated in The Online Webinar On "**Biodiversity and Public Heath**" Presented by Prof. C. R. Babu, FNASc, Professor Emeritus, Former Pro Vice Chancellor, University of Delhi On May 19, 2020, Organized by Eco Club Shivaji College Under the Aegis of IQAC In Collaboration with Society for Ecological Research and Natural Resources Management (SERNRM)
- Participated in the E-Workshop On "**Statistical Modelling Through R**" Held On 23rd To 27th June 2020, Organized by Department of Computer Science, Physics and IQAC Prasanta Chandra Mahalanobis Mahavidyalaya in Collaboration with Department of Statistics, West Bengal State University.
- Participated in the E-Workshop On "**Machine Learning Using Python**" Held On 24th To 28th August 2020, Organized by Department of Computer Science & IQAC Prasanta Chandra Mahalanobis Mahavidyalaya in Collaboration with A.K. Choudhury School of IT University of Calcutta.
- Participated in the online International webinar on 30th August, 2020**, Modern Biochemical tools: Prospects and opportunities** organized by Department of Biochemistry in collaboration with IQAC of West Bengal State University.
- Participated in the online webinar on "**Data Analytics and Security**" held on 15th October 2020 Organized by Departments of Computer Science, Physics and Mathematics East Calcutta Girls' College, Lake Town in Collaboration with R. C. Bose Centre For Cryptology and Security Indian Statistical Institute Kolkata.

Participation and Presentations in conferences and workshops

- **2017** Selected on merit for poster presentation on "**Osmolyte accumulation pattern in mangroves and associates in response to salinity and related stressful environment in Indian Sundarbans"** authored by Krishna Ray, Tapan Sutradhar, **Momtaj Begam,** Rajojit Chowdhury, Chandan Mukherjee and Sandip Kumar Basak at the International Symposium on "Insight to Plant Biology in Modern Era" organized by Bose Institute, Kolkata from February 8-10, 2017.
- **2016** International Seminar On "Molecular Physiological & Nutritional Responses During Pathophysiological Alteration of Cell Function" Organized by Department of Physiology, West Bengal State University, Barasat, January 4th& 7th, 2016.

- **2016 Training Course on Herbarium Techniques and Methodology** organised at Central National Herbarium, Botanical Survey of India, Howrah on 2nd April, 2016.

- **2016** Paper presentation on "**Sundarban grass rhizosphere microbes and their contribution to mangrove environment**" authored by Tapan Sutradhar, **Momtaj Begam**, Chandan Mukherjee, Rajojit Chowdhury, Sandip Kumar Basak and Krishna Ray at the National Conference on "New Avenues in Microbiology & Biotechnology: Challenges and Prospects" jointly organized by Department of Microbiology, West Bengal State University & Sarada Ma Girls' College, Barasat, India from March 18-19, 2016.

- **2016** UGC Sponsored National Seminar on "Medicinal Plants, Health and Environment" Organized by Department of Botany, Acharya Prafulla Chandra College, New Barrackpore in Collaboration with Department of Botany, Bajkul Milani Mahavidyalaya, September 9-10, 2016.

- **2016** International Workshop on "**Bioinformatics and Computational Biology**" organized by The Biome Research Facility, Salt Lake City, Kolkata, India from September 23-25, 2016.

- **2016** Helped in organizing National Seminar on "Molecular Approaches in Applied Biochemistry: Recent Advancements" organized by Department of Biochemistry, West Bengal State University, Barasat, India on February 12 and 15, 2016.

- **2014** National Symposium on "Evolving Plant Biology: From Chromosomes to Genomics" organized by West Bengal Academy of Science and Technology (WAST) in collaboration with Bose Institute, University of Calcutta and The Ramkrishna Mission Institute of Culture, Kolkata, India from November 27-29, 2014.

- **2014** 1st National Conference on "Advancing Biology through Technology and Computation" organized by Department of Microbiology, West Bengal State University & Kingston College of Science, Barasat, India on August 22, 2014.

- **2014** Selected on merit for oral presentation on **"Mangrove associates: a lesser studied assemblage in mangrove ecosystem"** authored by **Mst Momtaj Begam,** Tapan Sutradhar, Krishna Ray and Sandip Kumar Basak at the UGC & DST sponsored National Symposium on "Advances in Plant and Microbial Research" organized by DRS-III Department of Botany, University of North Bengal, Siliguri, India from December 12-13, 2014.

- **2014** Selected on merit for oral presentation on **"Organic solutes and soluble sugars: Back bone of mangrove salinity adaptation"** authored by Tapan Sutradhar, **Mst Momtaj Begam,** Sandip Kumar Basak and Krishna Ray at the UGC & DST sponsored National Symposium on "Advances in Plant and Microbial Research" organized by DRS-III Department of Botany, University of North Bengal, Siliguri, India from December 12-13, 2014.

- **2014** Selected on merit for poster presentation on **"Salt tolerant rice cultivars versus halophytic grass species- A Biochemical comparision"** Authored by Tapan Sutradhar, Angana Das, **Momtaj Begam,** Sandip Kumar Basak and Krishna Ray.

International Conference on "Molecular Biology and its Applications" organized by Department of Life Science & Biotechnology, Jadavpur University, Kolkata, India from February 14-15, 2014

Other Conferences & Workshops

- **2020** International Conference on Banana, Innovations in sustainable production and value chain management in banana. **Selected on merit for best poster presentation** on **"Screening for Sigatoka Leaf Spot disease resistance among eight Indian cultivars of banana"** authored by Ipsita Das, Subhajit Saha, **Mst. Momtaj Begam** and Krishna Ray organized by ICAR-National Research Centre for Banana, Trichy, Tamil Nadu, India from 22nd to 25th February 2020.
- **2018 4thInternational Plant Physiology Congress,** selected on merit for poster presentation on "**A differential gene expression profile distinguishes mangrove physiology under disturbed ecosystem from that of pristine one in Indian Sundarbans"** authored by Tapan Sutradhar, **Momtaj Begam**, Chandan Mukherjee, Sandip Kumar Basak and Krishna Ray Organized by CSIR - National Botanical Research Institute, Lucknow - 226001, India from 2nd-5th December, 2018.
- **2016** Paper presentation on "**Soil in degraded mangrove forest environment- A study from western part of Indian Sundarbans"** authored by Rajojit Chowdhury, Chandan Mukherjee, Tapan Sutradhar, **Momtaj Begam**, Sandip Kumar Basak and Krishna Ray at the National Conference on "Managing Soil Resource for Environmental Sustainability: Challenges and Perspectives" organized by Institute of Environment and Sustainable Development, Banaras Hindu University, Varanasi, India from December 9-10, 2016.
- **2016** Selected on merit for oral presentation on "**Cyanobacteria: Playing a late vital innings in parboiled rice mill effluent bioremediation on the platform set by microalgae"** authored by Chandan Mukherjee, Rajojit Chowdhury, Tapan Sutradhar, **Momtaj Begam,** Sandip Kumar Basak and Krishna Ray at the International Conference on "Microalgal and Cyanobacterial Biotechnology (MACB-2016)" organized by National Facility for Marine Cyanobacteria, Department of Marine Biotechnology, Bharathidasan University, Tiruchirappalli, India from August 29-31, 2016.
- **2016** Selected on merit for oral presentation on "**Osmotic adaptation in mangroves and associates-a challenge for degraded mangrove ecosystem**" authored by Krishna Ray, Tapan Sutradhar, **Mst. Momtaj Begam** and Sandip Kumar Basak at the International Conference on "Mangrove & Macrobenthos Meeting (MMM4)" organized by Flagler College, St. Augustine, USA from July 18-22, 2016.
- **2016** Selected on merit for oral presentation on **"Mangrove community structure analysis in western sundarbans in india-a guide for designing mangrove restoration"** authored by Sandip Kumar Basak, Tapan Sutradhar, **Mst. Momtaj Begam,** and Krishna Ray at the International Conference on "Mangrove & Macrobenthos Meeting (MMM4)" organized by Flagler College, St. Augustine, USA from July 18-22, 2016.

- **2016** Selected on merit for poster presentation on **"In search of soil indicators to evaluate the impact of sea level rise- A study from Sundarban, India"** authored by Chandan Mukherjee, Rajojit Chowdhury, **Mst. Momtaj Begam,** Tapan Sutradhar, Sandip Kumar Basak and Krishna Ray at the International Conference on "Mangrove & Macrobenthos Meeting (MMM4)" organized by Flagler College, St. Augustine, USA from July 18-22, 2016.

- **2015** Selected on merit for poster presentation on **"Loss of adaptive plasticity of mangroves in degraded ecosystem-a study based on osmolyte accumulation"** authored by Krishna Ray, Sandip Kumar Basak, Tapan Sutradhar, Chandan Mukherjee, Rajojit Chowdhury and **Momtaj Begam** at the "Challenges and Strategies in Plant Biology Research", 3rd International Plant Physiology Congress, IPP Congress 2015 organized by Jawaharlal Nehru University, New Delhi, India from December 11-14, 2015.
- **2015** Paper presentation on **"Establishing a degraded mangrove biorestoration technology in Indian Sundarban and associated study for the loss of mangrove ecosystem homeostasis"** authored by Krishna Ray, Tapan Sutradhar, **Momtaj Begam,** Rajojit Chowdhury, Chandan Mukherjee and Sandip Kumar Basak at the "IUCN SSC Mangrove Specialist Group 3rd Annual Symposium" organized by College of Environment & Ecology, Xiamen University, China, IUCN Mangrove Specialist Group and Zoological Society of London, UK at Xiamen, China from November 12-14, 2015.

References

Dr. Krishna Ray,
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Relation: Departmental Faculty

Prof. Zahed Hossain, Professor
& Head of The Department
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Relation: Teacher

Personal Details

Name	: **Mst Momtaj Begam**
Date of Birth	: 21.07.1989
Sex	: Female
Marital status	: Married
Nationality	: Indian
Languages Known	: English, Hindi and Bengali
Permanent address	: Village - Sukrabari, P.O. - Jitarpur, P.S. - Chanchal, District – Malda, Pin-732139, West Bengal, India.
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Declaration:

I hereby declare that the information furnished above are true to best of my knowledge.

Place: Malda
Date:

Mst. Momtaj Begam

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(Mst Momtaj Begam)