

Curriculum Vitae of Md. Ripaj Uddin

Institute of National Analytical Research and Service (INARS), Bangladesh Council of Scientific and Industrial Research (BCSIR)
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EDUCATION

2009 – 2010 Master of Science (Research) (Environmental Science)
National University, Bangladesh.
Session: 2009-2010, Year of Passing: 2010 Result:
First Class (71.00% Marks Obtained)

Thesis Topic: Assessment of Degradation of the Karnafully River Water Estuarine water and its impact on the environment, Chittagong, Bangladesh.

Details: One year program (full-time). Thesis length 25,000 words, undertaken over two semesters.
Examiners reports included in application. In this interdisciplinary research project, I Assessed Water Quality and its Impacts on Environment as well as Health, laboratory and field studies, and GIS analyses, to measure the risk to, and potential impacts on, aquatic organisms as a result of toxic environmental pollutants found in local habitats.

Supervisor: Dr. Muhammad Edrish Ali, Department of Chemistry, Chittagong College, National University, Bangladesh. 2005 - 2009

Bachelor of Science (Chemistry)

National University, Bangladesh.
Session: 2005-2006, Year of Passing: 2009 Result: Second
Class (59.60% Marks Obtained)

PROFESSIONAL EXPERIENCE

More than 10 years of research experience in the top-most Government research organization in Bangladesh.

- Working as **Scientific Officer** at **BCSIR** from 19 July 2021 – Present.
- Worked as **Research Chemist** at **BCSIR** from March 15, 2016 – 18 July 2021.
- **Asst. Research Officer**, Active Fine Chemicals Ltd., Mukhtarpur, Munshigonj, From July 2015 to March, 2016.
- **Best Innovator of BCSIR, 2021.**

RESEARCH INTEREST

Inorganic Chemistry, Analytical Chemistry, Environmental Science, Water Science, Geo- Chemistry, Water Treatment, Water Quality, Soil Science, Material Science, Phyto-chemistry, Phytoremediation, Micro plastics, Food Chemistry, Chromatography, Pharmaceuticals and Spectroscopy.

RESEARCH EXPERIENCE

2021-Current

Scientific Officer

Institute of National Analytical Research and service (INARS), Bangladesh Council of Scientific and Industrial Research (BCSIR)

2024 – Current

Academic Editor (PLS ONE),

Associate Editor, Natural Product Communications

Guest Editor of Air, Soil and Water Research; Journal of Infrastructure Policy and Development

Responsibilities:

- Research and Development (**R&D**) in the relevant fields.
- To publish **scientific articles** in SCOPUS Index journals.
- To **supervise** students from reputed universities to conduct their research work.
- Maintaining **ISO/IEC 17025:2017** accreditation on water quality testing parameters.
- To ensure **chemical safety and security** in the laboratory.
- Continual **improvement of the laboratory** to obtain accreditation for more testing parameters.
- Analysis of samples of research and services by Atomic absorption spectrometer (**AAS**) for metal content.
- To **supervise** laboratory technical staff to conduct commercial sample analysis.
- In-house **Calibration** of glassware and **Purchasing** traceable standards, chemicals, reagents, and consumables.
- Total Hardness, Total Alkalinity, Acidity, Free Carbon di oxide, Chloride determination Test of water by **Titrimetric** Method.
- Analyzed total element (N, C, H, O & S) by **elementary analyzer**.
- TOC Test of water by **TOC Analyzer**.
- Phenolic Compound by Test of water by **UV-Visible Spectrophotometer**.
- NMR Testing service

Till now, reviewed 200 more manuscripts from Elsevier, Springer and Taylor & Francis and other publishers

Reviewer

Activities

- Renewable & Sustainable Energy Reviews
- Science of the Total Environment
- Environmental Management
- Heliyon
- Natural Product Research
- Cogent Food & Agriculture (ORG)
- Regional Studies in Marine Science
- Air, Soil & Water Research
- Food Research International
- Regional Study in Marine Science
- Marine Pollution Bulletin
- Natural Product Communications
- Plos Water
- Discover Geoscience
- Discover Water
- Arabian Journal for Science and Engineering
- Biomass Conversion and Bio refinery
- Environmental Monitoring and Assessment
- Irrigation and Drainage
- Annals for Agri-bio Research
- Environmental pollution
- Environmental Challenge
- Journal of King Saud University-Science
- Frontiers in Chemistry
- Current Drug Therapy
- Journal of The Environmental Chemical Engineering
- Journal of The Environmental and Earth sciences
- Journal of Water and Health
- Chemosphere
- Water Resource and Industry
- Journal of Cleaner Production
- Agricultural Water Management
- Transactions on Maritime Science
- Journal of Hydrology
- Journal of Infrastructure Policy and Development
- Chemistry and Biodiversity
- Aquatic Ecology
- Soil and Sediment Contamination an International Journal
- Computer Modelling in Engineering and Science
- Results in Chemistry
- Water Environmental Research.
- Journal of Hazardous Material
- F1000Research
- World journal of Experimental Medicine
- Journal of Food Compositions and Analysis
- Process safety and Environmental Protection
- The Extractive Industries and society
- Plos One
- Biomass and Bioenergy
- Biomass and Bioenergy

SKILLS AND COMPETENCIES

Have professional training with certificates in sophisticated laboratory instruments Major:

Atomic Absorption Spectrometer (AAS), Ultra Violet (UV) Visible Spectrometer, Fourier Transform Infrared Spectrometer (FT-IR), Raman Spectrometer, Flame Photometer, Elemental Analyzer, Ion Chromatograph (IC), High- Performance Liquid Chromatography (HPLC), Gas Chromatography (GC), Gas Chromatography-Mass Spectrometry (GC-MS and GC-MS/MS), Nuclear Magnetic Resonance (NMR), Air Analyzer, Auto Analyzer, TOC Analyzer, Liquid Chromatography Mass Spectrometer (LCMS), and Inductively Coupled Plasma Mass Spectrometry (ICP-MS).

Minor:

Energy Dispersive X-Ray Fluorescence (ED-XRF), Thermo gravimetric and Differential Thermal Analyzer (TG/DTA), X-ray Diffractometer (XRD), FT-Raman Spectroscopy, Wavelength Dispersive X-ray Fluorescence (WD-XRF), *Scanning Electron Microscope (SEM)*, *Transmission Electron Microscopy (TEM)* and *X-ray Photoelectron Spectroscopy (XPS)*.

ISO/IEC 17025:2017 and ISO/IEC 17034:2023 Activities:

- Implementation of **ISO/IEC 17025:2017** quality management system as a Deputy Technical Manager and Valid Analyst of 100 water quality parameters.
- Lead Assessor of **ISO/IEC 17025:2017 and ISO/IEC 17034:2023**.
- Participated in the **proficiency testing (PT) program** in the year 2016 (for two parameters), 2016 (for 4 parameters), 2022 (for 5 parameters) and 2024 (for 5 parameters) from ERA, A Waters Company, USA, and completed successfully.

RESEARCH PUBLICATIONS (I have 50 more research articles but here I listed only last three years' publications)

Year 2025: 20

1. Azad, A. R., Karim, M. R., Rakib, M. R. J., & Uddin, M. R. (2025). Assessment of heavy metal pollution and spatial distribution in waterfalls of Chattogram District, Bangladesh: Implications for drinking and irrigation purposes. *Environmental Advances*, 19, 100613.
2. Jhumur, N. T., Jamal, A. S. I. M., Tasnim, A., Uddin, M. R., Hasan, M., Ahmed, S., & Shawon, M. T. A. (2025). Assessment of Heavy Metal Accumulation in the Coastal Region of Southwestern Bangladesh: Implications for Soil, Vegetation, and Human Health. *Journal of Food Composition and Analysis*, 107791.
3. Yasmine, S., Proma, R. Z., Uddin, M. R., Rahman, M. S., Islam, M. H., Al Mansur, M. A., ... & Siddiqi, M. M. A. (2025). Exploring the multifaceted roles of *Sonneratia apetala* and *Nipa fruticans* in coastal habitat restoration and bioactive properties discovery. *Phytomedicine Plus*, 5(1), 100687.
4. Akhter, F., Uddin, M. R., Al Mansur, M. A., Rahman, M. S., Akbor, M. A., Akter, N., ... & Kamruzzaman, S. (2025). Antidiarrheal, analgesic, antidepressant, antimicrobial and hypoglycemic activities of methanolic extract from *Sonneratia apetala* fruit, with identification of bioactive compounds in n-hexane, chloroform, and ethyl acetate fractions. *PLoS One*, 20(5), e0321280.
5. Islam, M. J., Rahman, M. A., Jahan, N., Mostafa, M. G., Akter, B., & Uddin, M. R. (2025). Isolation, structural characterization and molecular docking of β -sitosterol from *Trewia polycarpa* root bark: a potential source of bioactive compounds. *Discover Chemistry*, 2(1), 1-17.
6. Mostafa, M. G., Rahman, M. A., Biswas, P. K., Islam, A. R. M. T., Uddin, M. R., Hossen, M. N., ... & Rana, M. S. (2025). Mineralogy and provenance of red clay soils in Barind and Madhupur clay formations, Bangladesh: Implications for tectonic setting and chemical weathering. *Journal of Asian Earth Sciences*, 14, 100200.
7. Hayatullah, Mostafa, M. G., Rahman, M. A., Hossen, M. N., Lipy, E. P., Uddin, M. R., ... & Rahman, M. S. (2025). Toxicological Safety, Antimicrobial Efficacy, and Sensory Evaluation of River Sand-Derived Mica From Bangladesh: A Comprehensive Assessment for Cosmetic Applications. *Journal of Cosmetic Dermatology*, 24(9), e70448.
8. Bhuiyan, R. H., Rahman, M. S., Ali, M. E., Mostafa, M. G., Bhuiyan, M. M. R., Bhuyan, M. Z. H., & Uddin, M. R. (2025). Seasonal variation, spatial distribution, and health risk assessment of trace elements in a major canal of Chittagong, Bangladesh: Implications for irrigation suitability. *Regional Studies in Marine Science*, 104431.
9. Mostafa, M. G., Biswas, P. K., Rahman, M. A., Rana, M. S., Alam, M. S., Nuruzzaman, M., ... & Ahmed, F. (2025). Physico-chemical and thermal behavior of Barind red clay from Naogaon, Bangladesh: Implications for ceramic industries as a raw material. *Next Materials*, 9, 101080.
10. Alam, O., Li, J., Uddin, M. R., Zheng, X., Hosen, S., Tanvir, N. I., ... & Zhao, X. (2025). Unraveling the relations between heavy metals and microplastics transport and accumulation in the coastal environment. *Process Safety and Environmental Protection*, 107675.
11. Islam, M. J., Hayatullah, Rahman, M. A., Jahan, N., Mostafa, M. G., Akter, B., & Uddin, M. R. (2025). Isolation, structural characterization and molecular docking of β -sitosterol from *Trewia polycarpa* root bark: a potential source of bioactive compounds. *Discover Chemistry*, 2(1), 156.
12. Takeya, L. A., Haque, K. E., Ahmed, S., Siddique, M. A. B., Moniruzzaman, M., Uddin, M. R., & Rahman, M. S. (2025). Hydrochemistry, quality, and potential health risk appraisal of arsenic-enriched groundwater in central-west Bangladesh using the integrated water quality index and Monte Carlo simulation. *Science of The Total Environment*, 1003, 180707.
13. Uddin, M. R., Mustak, M. H., Nuruzzaman, M., Ahmed, F., Tazrin, J., Rahman, M. A., ... & Idris, A. M. (2026). Optimized H₃PO₄ activation of *Nypa fruticans* roots for high-performance activated carbon: Structural control and enhanced iodine adsorption. *Biomass and Bioenergy*, 205, 108488.
14. Jhumur, N. T., Jamal, A. S. I. M., Islam, M. H., Mukta, S. Y., Uddin, M. R., Al-Mansur, M. A., ... & Siddiqi, M. M. A. (2025). In silico investigation, phytochemical profiles and potential Biological approaches of natural products isolated from *Canarium resiniferum* bark extract. *In Silico Research in Biomedicine*, 100076.
15. Mostafa, M. G., Islam, M. S. U., Mondal, D., Adham, M. I., Rana, M. S., Hossain, M. I. S., ... & Uddin, M. R. (2025). Analysis of river dynamics and neotectonics of the Jamuna River using satellite and seismic data in Madarganj Upazila of Jamalpur District, Bangladesh. *Natural Hazards*, 121(6), 7123-7148.
16. Bhuyan, M. S., Siddique, M. A. B., Rao, D. N., Ismail, M., Uddin, M. R., Iheanacho, S., & Kunda, M. (2025). Heavy metal contamination in the sediment of seaweed culture site along the Cox's Bazar coast, Bay of Bengal, Bangladesh. *Discover Oceans*, 2(1), 59.
17. Azad, A. R., Karim, M. R., Akter, N., & Uddin, M. R. (2025). Assessment of Physicochemical Properties, Microbial Quality, and Spatial Water Quality Index Distribution in Chattogram's Waterfalls, Bangladesh. *CLEAN–Soil, Air, Water*, 53(11), e70063.
18. Rahman, M. S., Sultana, S., Biswas, P. K., Rahman, M. A., Reza, A. S., Moniruzzaman, M., ... & Ahmed, S. (2025). Monitoring and assessment of groundwater suitability for drinking and irrigation in the granary region of central-west Bangladesh using entropy index. *Journal of Trace Elements and Minerals*, 100272.
19. Rahman, M. A., Nahin, M. N. I., Mostafa, M. G., Pownceby, M. I., Hayatullah, Hossen, M. N., ... & Uddin, M. R. (2025). Extraction of Rare Earth Elements from Monazite: A Review of Current Practices and Emerging Opportunities for Bangladesh. *Mineral Processing and Extractive Metallurgy Review*, 1-17.
20. Abdullah-Al Mamun, M., Aktar, M. N., Uddin, M. N., Chowdhury, M. H., Islam, M. S., Rahman, M. S., ... & Islam, A. R. M. T. (2026). Hybrid data-driven framework for interpretable prediction of nitrate and sulfate risks in coastal aquifers. *Science of The Total Environment*, 1011, 181190.

Year 2024: 12

21. Hassan, A. M. M., Yao, C., Asif, M., **Uddin, M. R.**, Al-Mansur, M. A., Khandaker, M. U., & Yasmin, F. (2024). Assessing the potentials of rice straws as a solid fuel for the production of clean energy. *Applied Chemical Engineering*, 7(1).
22. Jamal, A. S. I. M., Jhumur, N. T., Shaikh, M. A. A., Moniruzzaman, M., **Uddin, M. R.**, Siddique, M. A. B. & Mahmud, R. (2024). Spatial distribution and hydrogeochemical evaluations of groundwater and its suitability for drinking and irrigation purposes in kaligonj upazila of satkhira district of Bangladesh. *Heliyon*.
23. **Uddin, M. R.**, Khandaker, M. U., Ahmed, S., Abedin, M. J., Hossain, S. M. M., Al Mansur, M. A & Idris, A. M. (2024). Assessment of coastal river water quality in Bangladesh: Implications for drinking and irrigation purposes. *Plos one*, 19(4), e0300878.
24. Kalashgrani, M. Y., Mousavi, S. M., Akmal, M. H., Gholami, A., Omidifar, N., Chiang, W. H., **Uddin, M. R.** & Rahman, M. M. (2024). Biosensors for metastatic cancer cell detection. *Clinica Chimica Acta*, 119685.
25. Uddin, M. R., Akhter, F., Abedin, M. J., Shaikh, M. A. A., Al Mansur, M. A., Rahman, M. S. & Khandaker, M. U. (2024). Comprehensive Analysis of Phytochemical Profiling, Cytotoxic and Antioxidant Potentials, and Identification of Bioactive Constituents in Methanolic Extracts of *Sonneratia apetala* Fruit. *Heliyon*.
26. Rahman, M. S., Reza, A. S., Sattar, G. S., Siddique, M. A. B., Akbor, M. A., Moniruzzaman, M & Shafiuzzaman, S. M. (2024). Mobilization mechanisms and spatial distribution of arsenic in groundwater of western Bangladesh: Evaluating water quality and health risk using EWQI and Monte Carlo simulation. *Chemosphere*, 143453.
27. Mehdi Hassan, A. M., Sharf, B., Ripaj Uddin, M., Zaman, M. N., Nuruzzaman, M., Zeb, H., & Khandaker, M. U. (2024). A model fitting approach for the investigation of thermo-kinetic parameters of rice straw: a viable renewable energy resources in Bangladesh. *Sustainable Energy Research*, 11(1), 33.

28. Shathi, A. S., Mostafa, M. G., Rahman, M. A., Biswas, P. K., Alam, M. S., Rana, M. S & Zaman, M. N. (2024). Iron removal from red clay using oxalic acid leaching for enhanced ceramic industry applications. *Heliyon*, 10(19).
29. Uddin, M. R., Siddique, M. A. B., Sultana, S., Bithi, U. H., Akter, N., Idris, A. M., & Khandaker, M. U. (2024). Techno-economic assessment and innovative production of nutrient-rich jam, jelly, and pickle from *Sonneratia apetala* fruit. *PLoS one*, 19(12), e0311846.
30. Forhad, H. M., Uddin, M. R., Chakrovorty, R. S., Ruhul, A. M., Faruk, H. M., Kamruzzaman, S., & Morshed, A. K. M. M. (2024). IoT based Real-Time Water Quality Monitoring system in Water Treatment Plants. *Heliyon*.
31. Yasmin, S., Proma, R. Z., Uddin, M. R., Rahman, M. S., Islam, M. H., Al Mansur, M. A., & Siddiqi, M. M. A. (2024). Exploring the Multifaceted Roles of *Sonneratia apetala* and *Nipa fruticans* in Coastal Habitat Restoration and Bioactive Properties Discovery. *Phytomedicine Plus*, 100687.
32. Mostafa, M., Islam, M.U., Mondal, D. *et al.* Analysis of river dynamics and neotectonics of the Jamuna River using satellite and seismic data in Madarganj Upazila of Jamalpur District, Bangladesh. *Nat Hazards* (2024). <https://doi.org/10.1007/s11069-024-07085-z>

Year 2023: 04

1. Jamal, A. S. I. M., Tarek, Y. A., Siddique, M. A. B., Shaikh, M. A. A., Debnath, S. C., **Uddin, M. R.**, & Sultana, S. (2023). Development of a fabricated first-flush rainwater harvested technology to meet up the freshwater scarcity in a south asian megacity, dhaka, Bangladesh. *Heliyon*, e13027.
2. Abu Md Mehdi Hassan, Muhammad Asif, Muhammad Abdullah Al-Mansur, **Md Ripaj Uddin**, Sultan J. Alsufyani, Farzana Yasmin, Mayeen Uddin Khandaker; Characterization of municipal solid waste for effective utilization as an alternative source for clean energy production, *J. Rad Res & App Sci*,16 (4):2023.
3. Hasan, A. B., Reza, A. S., Siddique, M. A. B., Akbor, M. A., Nahar, A., Hasan, **M.R. Uddin** & Islam, I. (2023). Origin, spatial distribution, sediment contamination, ecological and health risk evaluation of trace metals in sediments of ship breaking area of Bangladesh. *Journal of Hazardous Materials*, 133214.
4. Islam, M. A., Karim, M. R., Abedin, M. J., **Uddin, M. R.**, Hossain, S. M. M., Karmakar, S., & Moniruzzaman, M. (2023). Assessment of seasonal variation of heavy metal pollution and health risk in surface sediments at the Karnaphuli River confluences of Chattogram, Bangladesh.

Process Development

- Production of safe and Cost Effective Mineral Water.
- INARS achieved ISO/IEC 17025/IEC 17025:2017 accreditation from Bangladesh Accreditation Board (BAB) on100 parameters of drinking water and waste water.
- First Flush Rainwater Harvesting for Drinking Purpose
- Production of Jam from *S. appetala* Fruits
- A process of Desalination of coastal river water for drinking purpose.
- Production of Alkaline Mineral Water
- Production of Jelly and from *S. appetala* Fruits
- Production of Pickle from *S. appetala* Fruits
- Preparation of Reference Buffer Solution of pH 10

Patent

- Production of safe and Cost Effective Mineral Water (US Patent N0-1006847).
- Production of Jam, Jelly and Pickle from *S. appetala* Fruits.
- A process of Desalination of coastal river water for drinking purpose.
- Production of Alkaline Mineral Water

OTHER PUBLICATIONS

1. I have twenty research article under reviewed.
2. Book writer of "*Perspective Hatiya is the Singapore of Bangla*", 2019 and "*The History of Hatiya*", 2022.
3. I also developed BCSIR Apps and BCSIR chemical Inventory.
4. I have visited more than ten international corporate industries and solved more than ten thousand industrial problems through the testing and technical knowledge.

Member of Technical Society

- Life member of Bangladesh Chemical Society (BCS), LM-1734.
- Network of Instrument Technical personnel and User scientists of Bangladesh (NITUB), LM- 199.
- Lead assessor: Bangladesh Accreditation Board (BAB).

CONFERENCES/WORKSHOPS (I have presented my research worked both oral and poster under listed conferences)

- Biochemistry and Molecular Biology for Better Health, Congenial Environmental & Food Security", 12-13 January 2013, University of Chittagong, Bangladesh.
- Attended in the symposium on "Environmental Chemistry for Securing Water Quality" organized by Bangladesh Journal of Scientific and Industrial Research (BJSIR) on 30 July 2017 at BCSIR, Dhaka, Bangladesh.
- Day-long workshop on "Revised ISO/IEC 17011:2017 and ISO/IEC 17025:2017 standards" conducted by Bangladesh Accreditation Board (BAB), Dhaka, Bangladesh on 04 January, 2018 at Ministry of Industries, 91, Motijheel C/A, Dhaka-1000.
- 1st International Conference on Engineering Materials and Metallurgical Engineering, 2-24December, 2016, BCSIR, Dhaka
- Bangladesh Chemical Congress", 17-19 October, 2018, University of Dhaka, Bangladesh.
- BCSIR Congress", 12-14 December, 2019, BCSIR, Dhaka, Bangladesh.
- International Conference on Science and Technology for Celebrating the Birth Centenary of Bangabandhu (ICSTB-2021), 11-13 March, 2021
- *BCSIR Congress-2022` organized by Bangladesh Council of Scientific and Industrial Research(BCSIR), 01-03 December, 2022.*

GRANTS AND AWARDS

- ❖ **Six Projects (as Project Leader) approved by BCSIR with research grants of about 10000 USD**
 1. Developing a cost effective process for desalination of coastal river water" (FY: 2018-21, Completed).
 2. Isolation of Bioactive Compounds and Biological Studies on Mangrove Species, *S. appetala* Fruit and *Nipa fruticans* Fruit and Sap" (FY: 2022-24, Completed).
 3. Production of Alkaline Mineral (FY: 2023-24, Completed).
 4. Production of Biscuit and Vinegar from *Nypa fruticans* Plam Kernel and Sap (FY: 2023-25, Ongoing).
 5. Production of Jam, Jelly and Pickle from *S. appetala* fruit (FY: 2023-24, Completed).
 6. Well-Catchment Rainwater Harvesting for Sustainable Irrigation (FY: 2023-25, Ongoing).
- ❖ **Ten Projects (as Project Associated) approved by BCSIR with research grants of about 30000 USD**
 1. Development of Low Cost Arsenic Removal Technology using waste Iron Sludge (2019- 2021).
 2. Developing a purification technology of harvested rainwater using solar energy (2021- 2023).
 3. Development and validation of analytical methods for the estimation of vitamins in medicinal products (2017-2019).
 4. Developing a purification technology of saline water using solar energy (2021-2023).
 5. Contamination levels of toxic elements Gazipur industrial area of Bangladesh and theirphytoremediation study (2022-2024).
 6. Antibacterial study and Mosquito repellent activity of Canarium resiniferum (2022-2024).
 7. Development of a desalination technology of saline water for coastal areas of Bangladesh (2021-2023).
 8. Screening of potential microorganisms for bio-surfactant production and its versatile industrialapplications (2019-2021).
 9. Chemical fingerprint profile of secondary metabolites of selected medicinal plants (2016- 2018).
 10. Assessment of physicochemical properties of rainfall water in Bangladesh (2018-2020)
 - BCSIR Apps Development (as an Innovator and Coordinator), Funding By ICT division, Ministry ofInformation Technology, Peoples Republic of Bangladesh, Project grants of about 17,000 USD
 - BCSIR Chemical Inventory Development, approved by BCSIR with Project grants of about 3000 USD.
 - Supervise and assist more than 10 students for their research work through conceptualization, methodology, analytical services, manuscript writing and reviewing.