

MOHD TARIQUE

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SUMMARY

I am a geologist and geochemist with specialization in isotope geochemistry and advanced experience in geochemistry of hydrothermal vents, weathering and paleoclimate reconstruction using trace elements, stable and radiogenic isotope systematics.

RESEARCH INTERESTS

- Method development for non-traditional isotopes measurement using MC-ICPMS.
- Geochemistry of rock-water interactions at deep sea hydrothermal sites and role of hydrothermal fluxes in global geochemical budgets.
- Role of weathering and erosion on flux of elements to river, global biogeochemical cycle and climate.
- Development and application of paleoclimate proxies/tracers to better understand the deep ocean mineralization, ocean circulation, biogeochemistry, past climate and carbon-cycle perturbations.
- Reconstruction of seawater carbonate chemistry and atmospheric CO₂ at seasonal to millennial scale.
- Use of geochemical approach to understand the impact of ocean acidification on calcifying marine organisms and ocean biogeochemistry.

EDUCATION

Ph.D. (Geochemistry) National Centre for Polar and Ocean Research & Mangalore University, India, joint program <i>Thesis Title:</i> Trace elements and boron isotope study in marine carbonates: Reconstruction of paleo-pH and oceanographic conditions. <i>Supervisor:</i> Waliur Rahaman	August 2017 – April 2023
M.Sc. (Geology) Indian Institute of Technology, Kharagpur, India	July 2013 – June 2015 1st class
B.Sc. (Geology Hons. with physics and mathematics) Aligarh Muslim University, Aligarh, India	July 2010 – June 2013 1st class

PROFESSIONAL EXPERIENCE

Scientist-D National Centre for Polar and Ocean Research, India	January 2024 – Present
Postdoctoral Research Associate Department of Earth Sciences, University of Cambridge	September 2022 – January 2024 Mentor: Mike Bickle, FRS and Ed Tipper
Project Scientist-I National Centre for Polar and Ocean Research, India	April 2022 – August 2022 Mentor: Waliur Rahaman
Project Assistant Indian Institute of Science, Bangalore, India	November 2020 – March 2022 Mentor: Sambuddha Misra
Senior Research Fellow National Centre for Polar and Ocean Research, India	August 2017 – August 2020 Mentor: Waliur Rahaman
Junior Research Fellow National Centre for Polar and Ocean Research, India	August 2015 – August 2017 Mentor: Waliur Rahaman

TECHNICAL SKILLS

Column Chromatography: Ion-exchange column chromatography for purification of lithium (Li), boron (B), magnesium (Mg), strontium (Sr) and neodymium (Nd).

MC-ICPMS (Thermo-Fisher Scientific, Neptune Plus): Developing protocol for high precision B isotope analysis of carbonates. Nd isotope measurement of sediment, rocks, foraminifera and seawater. Stable ($\delta^{88}\text{Sr}$) and radiogenic Sr isotope measurements of sediment, water and corals. Li isotope measurement of water and foraminifera. Mg isotope measurement of water samples.

TIMS (Thermo-Fisher Scientific, Triton Plus): Analysis of Sr isotopes of water samples.

HR-ICPMS (Thermo-Fisher Scientific, Element XR): Analysis of trace-elements in foraminifera and corals samples.

Quadrupole ICP-MS (Agilent 7700, 7900, Thermo iCAP): Major and trace-element analysis of foraminifera, corals, sediments, rocks, water, and Antarctic ice core samples.

ICP-OES (Agilent 5100, 5110), Analysis of major and trace-elements in water and carbonates.

OTHER LABORATORY/RESEARCH SKILLS

- Skilled in geochemical clean lab management, operation and co-ordination.
- Experience in using desolvator sample introduction systems—Aridus II & III and Apex omega.
- Shipboard seawater sampling using CTD for trace elements and isotopes.
- Handling large datasets and applying statistical methods using Python.
- Separation, identification and picking of foraminifera.
- Subsampling of coral and bivalves using micromill and preparing thin sections.
- Cleaning of biogenic carbonates e.g. foraminifera and corals for trace-elements and isotope analysis
- Use of micro-distillation for purification of boron from foraminifera and coral samples.
- Sequential leaching of sediments to separate different phases.
- Experience in sample digestion (soil, sediment and rocks) using acids and Li borate fusion methods and processing water (river water, seawater and ice-core) for trace elements and isotope analysis.

RESEARCH CRUISE/FIELD WORK

Southern Ocean Expedition	6 Jan – 28 Feb 2017
Seawater collection for trace elements and Nd and Si isotope analysis	R/V S. A. Agulhas
Geological field work, Nepal Himalayas	5 Nov – 20 Dec 2022, 5 – 29 Apr & 3 – 13 Oct 2023
Spring, river water and sand collection for analysis of trace elements and isotopes of O, Sr, Li, Si and Mg	

FELLOWSHIPS AND GRANTS

Junior Research Fellowship (JRF)	June 2014
All India rank of 33	University Grant Commission, India
National Eligibility Test (NET)	June 2015
All India rank of 56	Council of Scientific and Industrial Research, India
Graduate Aptitude Test in Engineering (GATE)	June 2015
All India rank of 273	Department of Higher Education, India

AWARDS

Postdoctoral Fellowship – Postdoctoral fellowship at University of Cambridge, UK, 2022
Best poster award – (1st prize), National Conference on Polar Sciences, NCPOR, India, 2017
Best oral presentation award – (3rd prize), 52 convention Indian Geophysical Union, India, 2015

PUBLICATIONS

1. **Mohd Tarique**, Waliur Rahaman, N. Lathika, Priyesh Prabhat, Meloth Thamban, Sambuddha Misra, 2023, Enhanced CO₂ degassing from tropical ocean during colder climatic events of the last glacial cycle, *Palaeoceanography and paleoclimatology*, 38, e2022PA004570, DOI: <https://doi.org/10.1029/2022PA004570>

2. Mohd Amir, Debajyoti Paul, P Anchana, **Mohd Tarique**, Waliur Rahaman, **2023**, Geochemical evidence for west-flowing paleo-Yamuna River in the northwest India during the late Quaternary and its implication for Harappan Civilization, *Geochemistry*, 126021, DOI: <https://doi.org/10.1016/j.chemer.2023.126021>
3. Waliur Rahaman, N. Lathika, Priyesh Prabhat, **Mohd.Tarique**, Ravi Mishra and Meloth Thamban, **2023**, Eolian versus fluvial supply to the northern Arabian Sea during the Holocene based on Nd isotope and geochemical records, *Geoscience Frontier*, 14, 101618, DOI: <https://doi.org/10.1016/j.gsf.2023.101618>
4. **Mohd Tarique** and Waliur Rahaman, **2022**, Recent ocean acidification trends from boron isotope record of corals: Role of oceanographic processes and anthropogenic CO₂ forcing, *Journal of Earth System Science*, 131 (3), 165, DOI: <https://doi.org/10.1007/s12040-022-01907-z>
5. Priyesh Prabhat, Waliur Rahaman, N Lathika, **Mohd Tarique**, Ravi Mishra and Meloth Thamban, **2022**, Modern-like deep water circulation in Indian Ocean caused by Central American Seaway closure, *Nature Communications*, 13 (1), 7561, DOI: <https://doi.org/10.1038/s41467-022-35145-0>
6. Waliur Rahaman, **Mohd Tarique**, Fousiya A A, Priyesh Prabhat, Hema Achyuthan, **2022**, Tracing impact of El Niño Southern Oscillation on coastal hydrology using coral ⁸⁷Sr/⁸⁶Sr record from Lakshadweep, South-Eastern Arabian Sea, *Science of The Total Environment*, 843, 157035
DOI: <https://doi.org/10.1016/j.scitotenv.2022.157035>
7. **Mohd Tarique**, Waliur Rahaman, Fousiya A. A., N. Lathika., Meloth Thamban, Hema Achyuthan, Sambuddha Misra, **2021**. Surface pH record (1990–2013) of the Arabian Sea from boron isotopes of Lakshadweep corals—trend, variability, and control. *Journal of Geophysical Research: Biogeosciences*, 126: e2020JG006122, DOI: <https://www.doi.org/10.1029/2020JG006122>
8. N. Lathika, Waliur Rahaman, **Mohd Tarique**, Naveen Gandhi, Avinash Kumar, Meloth Thamban, **2021**, “Deep water circulation in the Arabian Sea during the last glacial cycle: Implications for paleo-redox condition, carbon sink and atmospheric CO₂ variability”, *Quaternary Science Reviews*, 257: 106853
DOI: <https://www.doi.org/10.1016/j.quascirev.2021.106853>
9. Waliur Rahaman, Lukas Smik, Deniz Köseoğlu, N Lathika, **Mohd Tarique**, Meloth Thamban, Alan Haywood, Simon T Belt, Jochen Knies, **2020**. “Reduced Arctic sea ice extent during the mid-Pliocene Warm Period concurrent with increased Atlantic-climate regime”, *Earth and Planetary Science Letters*, 550: 116535, DOI: <https://www.doi.org/10.1016/j.epsl.2020.116535>

CONFERENCES

1. **Mohd Tarique**, Mike Bickle, Ed Tipper, Abra Atwood, A. Joshua West, Role of weathering and flow path length on elemental and isotope composition of spring waters from the Melamchi valley, Nepal, 7-14 July 2023, **Goldschmidt**, held at Lyon, France.
2. **Mohd Tarique**, Waliur Rahaman, Fousiya A A, Sambuddha Misra, Hema Achyuthan, N Lathika, Meloth Thamban “Boron isotope based pH record of last three decades from the Arabian Sea coral”, 19-21 January 2022, **Indian Quaternary Congress-2022** participated virtually.
3. **Mohd Tarique**, Waliur Rahaman, Fousiya A A, Sambuddha Misra, Hema Achyuthan, N Lathika, Meloth Thamban “Boron isotope based pH record of last three decades using the Porites coral from the Arabian Sea”, 1-17 December 2020, **AGU Fall Meeting 2020** participated virtually.
4. **Mohd Tarique** and Waliur Rahaman, Assessment of boron isotope derived pH record from Pacific and Atlantic Ocean Corals: Oceanographic factors versus Anthropogenic CO₂ forcing, 16-17 May **2017**, **National Conference on Polar Sciences** held at Goa, India.
5. **Mohd Tarique** and Waliur Rahaman, Reconstruction of surface ocean pH using boron isotopic composition of foraminifera and corals, 52nd Convention, **Indian Geophysical Union**, 3-5 Nov **2015** held at Goa, India.