Dr. Sunil Paul Mathew M.

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Work History

Research Experience

Oct 2019 – Current **Postdoctoral Researcher**

(***Department of Soil Science and Soil Protection, Czech University of Life Sciences Prague, Czech Republic)***

- *Research focuses to investigate the behavior of organic pollutants (pesticides, pharmaceuticals etc.) in soil.*

Sept 2015 – June 2019 **Postdoctoral Researcher**

(***Division of Environmental Science and Engineering (SEE), POSTECH, Republic of Korea)***

- *Research focuses to investigate the transformation of environmentally relevant chemical processes in ice phase. For example, the dissolution of iron oxide in ice phase which has been largely affected by the presence of various environmentally important organic and inorganic ligands, pH etc.*

May 2014 - April 2015 **Visiting Student**

(***Division of Environmental Science and Engineering (SEE), POSTECH, Republic of Korea)***

- *Extensively studied the dissolution of Lead(IV) oxide in ice phase which is found to induce lead poisoning in the polar and other regions covered under snow/ice and thus receives extreme environmental relevance.*

Jan 2010 - Dec 2013 **Junior Research Fellow**

(***School of Environmental Sciences, Mahatma Gandhi University, India)***

- *Kinetic and Mechanistic investigation of environmentally and biologically relevant molecules (mainly Pharmaceutical and Personnel care products: PPCPs) by free radical reactions. This study involves the extensive use of analytical techniques such as high-resolution mass spectrometry, time-resolved spectroscopy, and various chromatographic techniques.*

Industrial Experience

Sept 2008 - Oct 2009 **Analyst**

(Quality Evaluation laboratory, Spices Board, Govt. of India)

- *Responsibilities includes analysis of various spices and spice products for different quality parameters. This work involves the use of highly sophisticated analytical instrumentation techniques including High-Performance Liquid Chromatography (HPLC), Gas Chromatography (GC), Atomic Absorption Spectroscopy (AAS), LC-MS/MS etc.*

Reviewer of International journals

- Environmental Science and Pollution Research (Springer)
- Catalysis Today (Elsevier)

Education

2011 – 2016	**Ph.D. in *Chemistry***, *Mahatma Gandhi University, India.*
2006 – 2008	**M. Sc. in *Chemistry***, *Mahatma Gandhi University, India.*
2003 – 2006	**B. Sc. in *Chemistry***, *Mahatma Gandhi University, India.*

Research Interests

- Structural elucidation of metabolites/ degradation products of organic pollutants by High Resolution Mass Spectrometry (HRMS).
- Characterization of isomeric compounds by Energy-Resolved Mass Spectrometry (ERMS).
- Trace level detection of organic pollutants by tandem Mass Spectrometry.
- Advanced Oxidation Processes (AOPs) for the degradation of organic pollutants from water.
- Chemical transformations in ice phase.
- Fast kinetics of free radical reactions by Pulse radiolysis technique.

Publications

In International Journals

1. **Sunil Paul, M. M.**; Min, DW.; Daun, J.; Aravindakumar, C. T.; Lee, W.; Choi, W.; Halide-induced dissolution of lead(IV) oxide in frozen solution. **J. Hazard. Mater.** 2020, 384, 121298
2. Kim, K.: **Sunil Paul, M. M.**; Daun, J.; Saiz-Lopez, A.; Choi, W.; Simultaneous and synergic production of bioavailable iron and reactive iodine species in ice. **Environ. Sci. Technol.** 2019, 53, 7355-7362.
3. Blaž, C,; Naglič, P,; **Sunil Paul, M. M.**; Pernuš, F.; Likar, B.; Poor optical stability of molecular dyes when used as absorbers in water-based tissue-simulating phantoms. **Proc. SPIE 10870, Design and Quality for Biomedical Technologies XII.** 2019, 108700N.
4. **Sunil Paul, M. M.**; Kim, K.: Lee, W.; Choi, C. H.; Choi, W.; Ligand-specific Dissolution of Iron Oxides in Frozen Solutions. **Environ. Sci. Technol.** 2018, *52*, 13766-13773.
5. **Sunil Paul, M. M**.; Nguyen, T. P.; Aravind, U. K.; Pramod, G.; Aravindakumar, C. T.; Exploring the Mechanism of Diphenylmethanol Oxidation: A Combined Experimental and Theoretical Approach. **Chemical Physics**. 2018, *513*, 201-208.
6. Oturan, N.; Aravindakumar, C.T.; Olvera-Vargas, H.; **Sunil Paul**, M. M.; Oturan, M. A.; Electro-Fenton oxidation of para-aminosalicylic acid: degradation kinetics and mineralization pathway using Pt/carbon-felt and BDD/carbon-felt cells. **Environ Sci & Pollut Res**. 2017, *24*, 969-978.
7. Sruthi, S. N.; Shylesh Chandran, M. S.; **Sunil Paul, M. M.**; Ramasamy, E. V.; Multiresidue analysis of organochlorine pesticides (OCPs) in soil samples of Kuttanad agro-ecosystem-a tropical wetland of peninsular India. ***Environ Sci & Pollut Res***. 2017, *24,* 969–978**.**
8. **Sunil Paul, M. M.**; Sreekanth, R.; Aravind, U. K.; Pramod, G.; Aravindakumar, C. T.; Transformation Reactions of Radicals from the Oxidation of Diphenhydramine: Pulse Radiolysis and Mass Spectrometric Studies. ***ChemistrySelect***, 2016, 5, 924-933.

9. **Sunil Paul, M. M**.; Laprévote, O.; Nguyen, T. P.; Aravind, U. K.; Pramod, G.; Aravindakumar, C. T.; Identification of Position Isomers by Energy Resolved Mass Spectrometry. ***J. Mass Spectrom.***, 2015**,** *50, 944–950.*
10. Pramod, G.; Swathy, V.; Luke, T. L.; **Sunil Paul, M. M**.; Aravindakumar, C. T.; Degradation of Dyestuff Pollutant Sudan I Using Advanced Oxidation Process. ***Journal of Water Resource and Protection***, 2014, 6, 1276-1283.
11. **Sunil Paul, M. M**.; Aravind, U. K.; Saha, A.; Pramod, G.; Aravindakumar, C. T.; Hydroxyl Radical Induced Oxidation of Theophylline in Water: A Kinetic and Mechanistic Study. ***Org. Biomol. Chem***. 2014, *12*, 5611-5620.
12. Olvera-Vargas, H.; Oturan, N.; Aravindakumar, C. T.; **Sunil Paul, M. M**.; Sharma, V. K.; Oturan, M. A.; Electro-oxidation of the Dye Azure B: Kinetics, mechanism and by-products. ***Environ Sci & Pollut Res***. 2014, *21,* 8379–8386.
13. Sreekanth, R.; **Sunil Paul, M. M**.; Aravind, U. K.; Marignier, J. L.; Belloni, J.; Aravindakumar, C. T.; Oxidation reactions of hydroxy naphthoquinones: Mechanistic investigation by LC-Q-TOF-MS Analysis. ***International Journal of Radiation Biology***. 2014, 90, 495-502
14. Sreekanth, R.; Prasanthkumar, K. P.; **Sunil Pau1, M. M**.; Aravind, U. K.; Aravindakumar, C. T.; Oxidation Reactions of 1- and 2-Naphthols: An Experimental and Theoretical Study. ***J. Phys. Chem***. *A,* 2013*, 117, 11261–11270.*
15. **Sunil Paul, M. M**.; Aravind, U. K.; Pramod, G.; Aravindakumar, C. T., Oxidative degradation of fensulfothion by hydroxyl radical in aqueous medium. ***Chemosphere*** 2013, *91*, 295-301.

A number of articles are under preparation.

In Conference Proceedings (selected)

- **Sunil Paul M. M**., Usha K., Pramod G., Saha A., Aravindakumar, C. T.; Oxidative Degradation of Theophylline by Hydroxyl Radicals in Aqueous Medium: A Pulse Radiolysis and Product Analysis Study, *Trombay Symposium on Radiation and Photochemistry,* January 6-9, 2014, Mumbai (Elected as the Best Poster).
- **Sunil Paul, M. M**.; Aravind, U. K.; Pramod, G.; Saha, A.; Aravindakumar, C. T.; Hydroxyl Radical Induced Oxidation of Theophylline in Water: A Kinetic and Mechanistic Study. *Third International Conference on Advanced Oxidation Processes, September 25-28, 2014,* Munnar.
- **Sunil Paul M. M**., Pramod G., Saha A., Usha K. A., Aravindakumar C. T.; Oxidation Reactions of Theophylline by Hydroxyl Radicals in Water: A Mass Spectrometric Investigation, *International Conference on Frontiers of Mass Spectrometry (ICMS 2013), September 6-9, 2013, Kottayam.*
- **Sunil Paul M. M**., Aravind U. K., Saha A., Pramod G., Aravindakumar C. T.; Oxidation of Theophylline by Hydroxyl Radical in Aqueous Medium, *National Symposium on Radiation and Photochemistry (NSRP-2013), March 20-22,2013, Shillong.*
- **Sunil Paul M. M**. Aravind U. K. Pramod G., Aravindakumar C. T.; Oxidative degradation of fensulfothion by hydroxyl radical in aqueous medium, *Second International Conference on Advanced Oxidation Processes, October 5-8, 2012,* Kottayam.
- **Sunil Paul M. M**., Aravind U. K., Aravindakumar C. T.; Photochemical degradation of fensulfothion in aqueous medium. *24thKerala Science Congress 2012,* January 29-31, 2012, Kottayam.
- **Sunil Paul M. M**., Aravind U. K., Aravindakumar C. T.; Photochemical degradation of fensulfothion in aqueous medium. *Trombay Symposium on Radiation and Photochemistry*, January 5-8, 2012, Mumbai.
- **Sunil Paul M. M**., Choi W.; Reductive dissolution of goethite in frozen condition. *2nd SNU Workshop on Ice Chemistry and Physics,* July 16, 2018), Seoul.

Several other national and international events in India and Republic of Korea.

Conferences organized/attented

- **International Conference on Frontiers of Mass Spectrometry** (ICMS 2013), Kottayam, India
  Coordinator, Organizing Committee
- **Second International Conference on Membranes** (ICM-2013), Kottayam, India
  Member, Local Organizing Committee
- **Second International Conference on Advanced Oxidation Processes** (AOP-2012), Kottayam, India
  Member, Local Organizing Committee
- **International Conference on Membrane** (ICM-2011), Kottayam, India
  Member, Local Organizing Committee
- **International Conference on Advanced Oxidation Processes** (AOP-2010), Kottayam, India
  Member, Local Organizing Committee
- **Third International workshop on Frontiers in Environmental Chemical Research** (2016), Pohang, Republic of Korea
- **Trombay Symposium on Radiation and Photochemistry** (TSRP-2014), Mumabi, India
- **2015 Winter workshop** (EPB Program), Muju, Republic of Korea
- **25th Kerala Science Congress**, Thiruvananthapuram, India (2013)
- **24th Kerala Science Congress**, Kottayam, India (2012)
- **Trombay Symposium on Radiation and Photochemistry** (TSRP-2012), Mumbai, India
- **International Conference on Climate Change and Developing Countries** (CCDC-2010), Kottayam, India

Several other national and international events in India and Republic of Korea.

Skills/Expertise

Expertise in Instruments

- High Resolution Mass Spectrometer (UPLC-Q-TOF) (Waters)
- Triple Quadrapole and Quadrapole – Ion trap (Q-Trap) Mass Spectrometers (Applied BioSystems)
- Liquid Chromatography-Single Quadrapole Mass Spectrometer (LC-MS) (Shimadzu)
- Linear electron accelerator with time resolved optical absorption system (Pulse Radiolysis)
- High Performance Liquid Chromatography (Shimadzu)
- Gas Chromatography (Perkin Elmer and Shimadzu)
- Ion Chromatography (Dionex)
- Fluorescence Spectrophotometer (Perkin Elmer)
- ATR-FT-IR (Shimadzu)
- Inductively Coupled Plasma–Optical Emission Spectrometer (ICP-OES) (Thermo)
- Atomic Absorption Spectrometer (Perkin Elmer)
- UV-Vis Spectrophotometer (Shimadzu, Perkin Elmer and Agilent)

Technical Expertise

- **OS :** Windows, Linux & Android
- **Software:** ACD Chem Sketch, ChemOffice ChemDraw, Microcal Origin, Microsoft Office, Adobe Photoshop, etc.

Awards

- **Senior Research Fellowship (SRF)** from Council of Scientific and Industrial Research (CSIR), Govt. of India
- **Dr. Hari Mohan memorial award** for the best poster in Trombay Symposium on Radiation and Photochemistry (TSRP 2014) held on January 6-9, 2014, Mumbai, India.
- Selected as an "**International visiting student**" by Pohang University of Science and Technology (POSTECH), Pohang, Republic of Korea, for a period of one year (2014)

Other Interests

- Linux & Android (learning & development)
- Photography, Photo-designing, Traveling, Music and Sports (Badminton, Football, Cricket)

Personal Information

Date of Birth: 23 April 1986 **Gender:** Male **Languages:** English, Malayalam, Hindi

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References

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