# KAREN JORDAAN

## CONTACT ME


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## PERSONAL INFORMATION

- Languages: English & Afrikaans
- Place of Birth: Pretoria, South Africa

## EDUCATION

**North-West University, Potchefstroom campus, South Africa**
*Ph.D. Environmental Sciences | 2015*
- Dissertation: Molecular profiling of microbial population dynamics in environmental water

**North-West University, Potchefstroom campus, South Africa**
*M.Env.Sci Environmental Sciences and Management | 2008*
- Thesis: The evaluation of multiplex PCR and DNA profiling methods (DGGE and SSCP) for the detection of mycotoxigenic Fusarium species

**North-West University, Potchefstroom campus, South Africa**
*B.Sc. Chemistry, Physiology, Microbiology | 2006*

## WORK EXPERIENCE

- **Postdoctoral fellow | 1 Oct 2021 - present**

*University of Pretoria, CMEG; 40-hour work week*

Key responsibilities:
1. Collect and process environmental samples for soils, litter, and greenhouse gases across South Africa.
2. Use molecular-based methods (e.g., qPCR) and omics techniques (e.g., Illumina amplicon sequencing) to characterize the microbial diversity and identify gene abundances for functional microbial groups.
3. Perform statistical and bioinformatics analyses to determine the impact(s) of the environment on microbial community dynamics.
4. Write scientific articles as well as reports for funding bodies/collaborators.
5. Collaborate with other projects and assist postgraduate students.

- **Freelance Editor | July 2022 - present**

*Enago & Charlesworth Group; 20-hour work week*

Key responsibilities:
1. Format manuscripts to improve grammar, punctuation, sentence structure, and word choice.
2. Ensure flow, transition, correct terminology, and coherence.
3. Ensure that manuscripts follow the correct style guidelines and citation style.

- **Postdoctoral fellow | 1 Aug 2019 – 1 Oct 2021**

*Pontificia Universidad Católica de Chile, Depto. Genética Molecular y Microbiología, Facultad de Ciencias Biológicas; 44-hour work week*

Key responsibilities:

1. Collected and processed soil samples from the Atacama Desert.
2. Isolated total DNA, RNA, and Virus-Like-Particles (VLPs) from desert soils.
3. Used omics techniques (e.g., Illumina amplicon, metagenome, and metatranscriptome sequencing) and bioinformatics analysis to characterize the microbial and viral diversity in Atacama soils.
4. Performed microcosm studies and statistical analysis to determine the impact of environmental parameters on microbial and viral diversity in Atacama soils.
5. Prepared financial and technical reports for the funding body.
6. Assisted postgraduate students with analysis.

- **Postdoctoral fellow | 31 January 2015 – 1 Aug 2021**

*The University of Pretoria, Department of Microbiology and Plant Pathology & CMEG (in collaboration with Monash University)*
*Australia-Awards Africa Postdoctoral Fellowship Grant; 40-hour work week*

Key responsibilities:

1. Collected and processed soils samples from Australian drylands.
2. Isolated total DNA and RNA from desert soils.
3. Performed microcosm studies to determine the impact of water availability on hydrogen-oxidizing bacteria in Australian dryland soils.
4. Performed carbon fixation assays to determine the chemosynthetic and/or photosynthetic ability of microorganisms.
5. Performed gas chromatography analysis to determine if microorganisms can utilize atmospheric $H_2$.

- **Lecturer | 1 Jan 2009 – 31 Dec 2009**

*Vaal University of Technology, South Africa; 40-hour work week*

Key responsibilities:

Teaching theory for undergraduate students. Courses included:

1. Microbiology
2. Microbial Biochemistry

- **Environmental Graduate | 1 July 2008 – 31 January 2009**

*BHP Billiton Energy Coal South Africa, Witbank; 40-hour work week*

Key responsibilities:

Received introductory training about the various company departments and Environmental Impact Assessment related to coal mining.

- **Research Assistant | 2007 - 2008**

*Sasol Water Recovery Unit, Secunda, South Africa; 40-hour work week*

Key responsibilities:

1. Assisted with molecular research (e.g., DGGE) and microscopy for the wastewater treatment plant (WWTP).
2. Cultivated anaerobic microorganisms present in the WWTP.
3. Measured ATP levels in WWTP flocs.

## PUBLICATIONS

1. Cowan, D.A., Lebre, P.H., Amon, C.E.R., Becker, R.W., Boga, H.I., Boulangé, A., Chiyaka, T.L., Coetzee, T., de Jager, P.C., Dikinya, O., Eckardt, F., Greve, M., Harris, M.A., Hopkins, D.W., Houngnandan, H.B., Houngnandan, P., **Jordaan, K.** et al. 2022. Biogeographical survey of soil microbiomes across sub-Saharan Africa: structure, drivers and predicted climate-driven changes. *Microbiome*, 10: 131. DOI: 10.1186/s40168-022-01297-w
2. Ramond, J.-B., **Jordaan, K.**, Diez, B., Heinzelmann, S.M., Cowan, D.A. 2022. Microbial Biogeochemical Cycling of Nitrogen in Arid Ecosystem. *MMBR*, 85(2): e00109–21. DOI:https://doi.org/10.1128/mmbr.00109-21.
3. Ortiz, M., Leung, P.M., Shelley, G., Jirapanjawat, T., Nauer, P.A., Van Goethem, M.W., Bay, S.K., Islam, Z.F., **Jordaan, K.,** Vikram, S., Chown, S.L., Hogg, I.D., Makhalanyane, T.P., Grinter, R., Cowan, D.A., Greening, C. 2021. Multiple energy sources and metabolic strategies sustain microbial diversity in Antarctic desert soils. *PNAS*, 118(45): e2025322118. DOI:10.1073/pnas.2025322118.
4. **Jordaan, K.,** Lappan, R., Dong, X., Aitenhead, I.J., Bay, S.K., Chiri, E., Wieler, N.,Meredith, L.M., Cowan, D.A., Chown, S.L., Greening, C. 2020. Hydrogen-oxidizing bacteria are abundant in desert soils and strongly stimulated by hydration. *mSystems*, 5:e01131–20. DOI:https://doi.org/10.1128/mSystems.01131-20.
5. **Jordaan, K.,** Comeau, A.M., Khasa, D.P., Bezuidenhout, C.C. 2019. An integrated insight into the response of bacterial communities to anthropogenic contaminants in a river: A case study of the Wonderfonteinspruit catchment area, South Africa. *PLoS ONE* 14(5): e0216758. DOI: https://doi.org/10.1371/journal.pone.0216758.
6. **Jordaan, K.,** Bezuidenhout, C.C. 2016. Bacterial community composition of an urban river in the North West Province, South Africa, in relation to physico-chemical water quality. *Environmental Science and Pollution Research*, 23(6):5868–5880.
7. Bumunang, E.W., **Jordaan, K.,** Barros, E., Bezuidenhout, C., Babalola, O.O. 2015.Analysis of rhizobacterial community in field grown GM and non-GM maize soil samples using PCRDGGE. *Journal of Agricultural Technology*, 11(4): 831–838.
8. **Jordaan, K.,** Bezuidenhout, C.C. 2013. The impact of physic-chemical water quality parameters on bacterial diversity in the Vaal River, South Africa. *WaterSA*, 39(3): 365–376.

## BOOK CHAPTERS

**Jordaan, K.**, Stucken, K., Diez, B. 2022. C, N and P nutrient cycling in Drylands. In: Ramond, J-B., Cowan, C.A. (eds). Microbiology of Hot Deserts. Ecological Studies Series. Springer Nature Switzerland.

## CONFERENCE OUTPUTS

1. ISME Latin America, Santiago, Chile. 2019. **Attendee**
2. Bezuidenhout, C.C., **Jordaan, K.** 2013. Bacterial and fungal diversity of riverine biofilms using 454-pyrosequencing. 5th Congress of European Microbiologists (FEMS), Leipzig, Germany. **Poster presentation.**
3. Bezuidenhout, C.C., **Jordaan, K.** 2013. A 454-pyrosequencing study of impacts of physicochemical parameters on bacterial community diversity within an urban river system. 18th Biennial Conference of the South African Society of Microbiology (SASM), Bela-Bela, South Africa. **Poster presentation.**
4. **Jordaan, K.,** Bezuidenhout, C.C. 2011. Molecular characterization of bacterial populations in groundwater sources in the North West province. 17th Biennial Conference of the South African Society of Microbiology (SASM), Cape Town, South Africa. **Oral presentation.**
5. **Jordaan, K.,** Bezuidenhout, C.C. 2011. Optimization of a 16S rDNA and/or 16S rRNA profiling method (DGGE and/or SSCP) for identification of bacteria in aquatic environments. 4th Congress of European Microbiologists (FEMS), Geneva, Switzerland. **Poster Presentation.**
6. **Jordaan, K.**, Bezuidenhout, C.C. 2010. The development of an RNA and/or DNA profiling method for rapid and accurate identification of bacteria in freshwater systems. Water Institute of South Africa (WISA) 2010 Biennial Conference, Durban, South Africa. **Oral Presentation.**

## GRANTS & AWARDS

**CONICYT-FONDECYT Postdoctorado 2019 Fellowship Grant | 2019**
*Pontificia Universidad Católica de Chile, Depto. Genética Molecular y Microbiología, Facultad de Ciencias Biológicas.*
*~26.662.000 Chilean pesos/year for 3 years*

**Australia-Awards Africa Postdoctoral Award | 2017**
*University of Pretoria, CMEG & Monash University, Australia*.

**A/S Commonwealth Scholarship Program, Program DFAIT International Fellowships | 2013**
*Université Laval, Québec*

**National Research Foundation (NRF) Research Grant | 2006-2007**
*North-West University, Potchefstroom campus, South Africa.*

## COLLABORATIONS

1. Response of microbial communities to climate change in the Kalahari Karoo: Prof. J-B Ramond; CMEG, University of Pretoria & Tswalu Kalahari Reserve

2. Gut microbial communities in hunter-gatherers: Dr. Riaan Rifkin; CMEG, University of Pretoria
3. Microbial communities in Antarctic penguin rookeries: Diego Segura, Prof. Beatriz Diez, & Prof. Angélica Casanova-Katny; Pontificia Universidad Católica de Chile & *Universidad Católica de Temuco, Temuco, Chile*
4. Soil phages in the Atacama Desert: Prof. Beatriz Diez & Prof. J-B Ramond; Pontificia Universidad Católica de Chile

## PAPERS IN PREPARATION

1. Microbial community dynamics in Antarctic penguin rookery soils (Shared first co-author, currently under review)
2. Microbial communities in the Namib Desert (Shared first co-first author, manuscript in preparation)
3. Microbial communities in Botswana drylands (co-author, manuscript currently being revised)
4. Climate change and hot arid lands. (Co-author, manuscript in preparation)

## RESEARCH INTERESTS

- Soil Microbial Ecology
- Freshwater Microbial Ecology
- Extreme Environments
- Anthropogenic Environmental Change
- Molecular Ecology

## SKILLS

- Microbiological & Molecular techniques (e.g., Nucleic acid extraction from water, soils, biofilm; Multiplex PCR; qPCR; Fungal spore counting - hemacytometer; DGGE & SSCP; Sanger sequencing, etc.)
- VLP extractions from soils
- Data analyses (Mothur, Qiime, R)
- Phylogenetic analyses (MEGA, Mothur, Qiime, JModelTest, PhyML)
- Bioinformatic & statistical analyses

## REFERENCES

References will be provided upon request.