



## **Christopher A. Dada, PhD.**

*Water Quality /Microbiology Specialist*

### **Education**

PhD – Water Microbiology,  
National University of Malaysia  
(UKM), 2014

M. Sc (Hons) – Water Science,  
Policy and Management,  
University of Oxford, United  
Kingdom, 2007

B.Sc. (First Class)– Microbiology,  
University of Ado-Ekiti, 2004

Dr Dada is an environmental health microbiologist, specializing in the fate, transport, detection, and control of pathogens in environmental media. He completed a Masters degree in Water Policy at Oxford University's Center for the Environment which adequately equipped him to provide high-level advisory support to decision makers, managers and policy makers in water policy and management. His PhD research focused on the molecular characterization of faecal indicator bacteria and antibiotic resistant pathogens in aquatic environments. Dr Dada has gained extensive experience in environmental science research with a focus on projects that assess/predict the effect of past/future management decisions on water quality. As a Research Fellow under the leadership of Prof David Hamilton, he honed his modelling skills (nitrogen/phosphorus species and pathogens) using a variety of catchment, hydrodynamic and empirical models.

### **Specialty areas:**

*Microbiology- Drinking and Bathing Water Bacteriological Quality*

*Quantitative Microbial Risk Assessment (QRMA) for Pathogens in Waterways*

*Antibiotic Resistance in the Environment*

*Environmental Impact Assessment*

### **Employment History**

- Research Officer, Environmental Research Institute, University of Waikato, Hamilton, April 2015- April 2017
- More than 11 years' experience working in scientific consultancy, research and education roles in South-East Asia, Africa and New Zealand
- More than 5 years of hands-on experience working in Microbiology laboratories in South East Asia, Africa and the United Kingdom.
- 6 months volunteering experience with the United Nations as Water and Sanitation Officer, UNMIL/UNV, Monrovia, Liberia

### **Selected examples of recent experience**

***WWTP Environmental Impact Assessment: Effect of Proposed Treated Waste Water Discharge into Lake Rotorua, Rotorua Lakes Council, 2016-ongoing.*** I led a study which sought to provide expert opinion on the potential impact (nutrients/pathogens/pH/metals) of the proposed, treated wastewater discharge through Te Arikioa Stream into Sulphur/Puarenga Bay, when current discharge consent expires in 2019. This EIA project also involved collaboration with experts at MWH (now part of Stantec) and will culminate in the collation of an 'Assessment of Environmental Effects' report.

***Calibration of a one-dimensional water quality model for Lake Ellesmere, Environment Canterbury, 2015-2016.*** The goal of the project was the calibration of a one-dimensional water quality model that predicts the influence of various catchment management options and lake opening scenarios on salinity and nutrient levels in Lake Ellesmere, Canterbury. A draft of the report was submitted to Environment Canterbury.

*Modelling the impact of sewage reticulation on water quality of Lake Tarawera, New Zealand, Lake Tarawera Ratepayers Association, 2015.* I was the lead investigator on a Lake Tarawera Sewage Reticulation study to assess the potential impact of sewage reticulation on lake water quality. From a public health perspective, this study highlighted the need for efforts aimed at investigating and curbing potential sources of faecal contamination of drinking water sources within the catchment. The study concluded that the implementation of a reticulated sewage system could curtail the influx of manageable sources of nutrients from the lake catchment, as well as reduce public health risks associated with poorly performing on-site treatment systems.

*Analysis of high frequency buoy data, New Zealand, MBIE, 2015-2017.* This data-exploration project involved quality assurance and quality control, and exploratory analysis of high-frequency buoy data. This project aimed to assess drivers of variations of *E. coli* abundance in Lake Rotorua as well as to develop multivariate statistical approaches for water quality prediction. The study formed the basis for the publication of an article in a leading environmental science journal on the Development of Predictive Models for Faecal Indicator Bacteria in New Zealand.

*Bacteriological quality of recreational waters in Malaysia, South East Asia, National University of Malaysia, 2010-2011.* These studies were supported by a Malaysian government grant (Science Fund 04-01-02-SF0754) under the auspices of the School of Bioscience and Biotechnology. I led a series of studies that assessed the validity of multiple indicator organisms for bacteriological beach quality monitoring in Malaysian waterways using a multivariate approach. The study provided policy makers with an evidenced-based approach to parameter streamlining for optimized beach sampling and sustainable bacteriological quality monitoring.

*Occurrence of antibiotic resistance in aquatic environments in Malaysia, South East Asia, National University of Malaysia, 2012-2014.* These studies were supported by internal funding from the National University of Malaysia (UKM-GUP-2011190) with a view to conducting bio-surveillance, detection, speciation and reporting of antimicrobial resistance incidence in faecal indicator bacteria (FIB) in Malaysia waterways. In these studies, I successfully used several advanced molecular techniques (e.g. Random Amplified Polymorphic DNA-based [RAPD-PCR] and Multilocus sequence typing [MLST]) to elucidate the presence of genetically diverse fecal bacteria with associated virulence traits and a background of recombination events in surface recreational water. The findings identified potential public health risks and also formed the basis for several scientific publications, many of which are in top (Q1 and Q2) international journals.

## Selected Peer Reviewed Publications

Dada, A. C. Hamilton, D. P. 2017. Lake Management, A restoration perspective. Chapter 28 - Advances in New Zealand Freshwater Science, Springer Publishers. In Press.

Dada, A. C., & Hamilton, D. P. (2016). Predictive Models for Determination of *E. coli* concentrations at Inland Recreational Beaches. *Water, Air, & Soil Pollution*, 227(9), 347-360.

Ahmad, A., Dada A.C, Usup, G., Heng, L.Y (2014) Occurrence of Enterococcus Species with Virulence Markers in an Urban Flow-Influenced Tropical Recreational Beach. *Marine Pollution Bulletin* DOI: 10.1016/j.m014.03.028

Ahmad, A., Dada A.C, Usup, G., Heng, L.Y (2014) Application of Multilocus Sequence Analysis for the Molecular Characterization of Enterococci with Putative Virulence Factors Recovered from a Tropical Recreational Beach, *Southeast Asian Journal of Tropical Medicine and Public Health Journal (SEAMEO)*, 43(3): 700-712

Ahmad, A., Dada A.C, Usup, G., Heng, L.Y (2014) Biofilm production, esp and asa gene carriage among beach enterococci. Accepted for publication (in press), March 2014, *Glob J Health Science*

Ahmad, A., Dada, A. and Usup, G. (2014) Survival of Epidemic, Clinical, Faecal and Recreational Beach Enterococci Strains with Putative Virulence Genes in Marine and Fresh Waters. *Journal of Environmental Protection*, 5, 482-492. doi: 10.4236/jep.2014.56051.

Dada, A. C., Ahmad, A., Usup, G., & Heng, L. Y. (2013). Occurrence of virulence determinants among enterococci from recreational beaches in Malaysia, *International Journal of Antimicrobial Agents*, 42 (S2): S59-S60 [http://dx.doi.org/10.1016/S0924-8579\(13\)70303-0](http://dx.doi.org/10.1016/S0924-8579(13)70303-0).

Ahmad, A., Dada A.C, Usup, G., Heng, L.Y (2013) Validation of the Enterococci indicator for bacteriological quality monitoring of beaches in Malaysia using a multivariate approach. *SpringerPlus*. 2:245

Ahmad, A., Hamid, R., Dada, A. C., & Usup, G. (2013). *Pseudomonas putida* Strain FStm2 Isolated from Shark Skin: A Potential Source of Bacteriocin. *Probiotics and Antimicrobial Proteins*, 5(3), 165-175

Dada A.C, Ahmad, A., Usup, G., Heng, L.Y (2012) Speciation and antimicrobial resistance of Enterococci isolated from recreational beaches in Malaysia. *Environmental Monitoring and Assessment*, 185(2): 1583-1599

Dada A.C, Ahmad, A., Usup, G., Heng, L.Y (2012) Antibiotic Resistance and Virulence among Enterococci Isolated from Teluk Kemang Beach, Malaysia. *Water Quality, Exposure and Health*, 4(2):113-122

Dada, A. C., Ahmad, A., Usup, G., & Heng, L. Y. (2012). Virulence characteristics and antibiotic resistance among Enterococci isolated from Bagan Lalang beach, Malaysia, *International Journal of Infectious Diseases*, 16 (S1): e412.

Dada, A. C., Asmat, A., Gires, U., Heng, L. Y., & Deborah, B. O. (2012). Bacteriological monitoring and sustainable management of beach water quality in Malaysia: problems and prospects. *Glob J Health Sci*, 4(3), 126-138. doi: 10.5539/gjhs.v4n3p126

Dada, A. C., Ahmad, A., Usup, G., & Heng, L. Y. (2012). High-level aminoglycoside resistance of Enterococci isolated from recreational beaches in Malaysia. *Environmental Monitoring and Assessment*, 185(9):7427-43

## **Selected Reports**

Dada, A. C. Hamilton, D. P. 2017. Modeling the impact of discharge of treated wastewater through Te Arikiroa Stream into Sulphur/Puarenga Bay, Lake Rotorua (draft). UoW Environmental Research Institute Client report in preparation for Rotorua Lake Council, 120pp.

Dada, A. C., McBride, C. M., Verburg, P., Hamilton, D. P. 2016. Modeling the impact of sewage reticulation in the Lake Tarawera catchment. Client report prepared for the Lake Tarawera Ratepayers Association. Environmental Research Institute Report No. 85, The University of Waikato, Hamilton.

Hamilton, D. P., McBride, C. M. and Dada, A. C., 2016. A water quality model for Lake Ellesmere. Environmental Research Institute Client report prepared for Environment Canterbury.