

## **Title: Community structure of nitrifying and denitrifying bacteria from effluents discharged into Lake Victoria, Kenya**

**James Wachira**

University of Embu, Kenya

Received: March 06, 2023; Accepted: March 08, 2023; Published: March 27, 2023

An active microbial community of nitrifying and denitrifying bacteria is needed for efficient utilization of nitrogenous compounds from wastewater. In this study, we explored the bacterial community diversity and structure within rivers, treated and untreated wastewater treatment plants (WWTPs) discharging into Lake Victoria. Water samples were collected from rivers and WWTPs that drain into Lake Victoria. Physicochemical analysis was done to determine the level of nutrients or pollutant loading in the samples. Total community DNA was extracted, followed by Illumina high throughput sequencing to determine the total microbial community and abundance. Enrichment and isolation were then done to recover potential nitrifiers and denitrifiers. Physicochemical analysis pointed to high levels total nitrogen and ammonia in both treated and untreated WWTPs as compared to the samples from the lake and rivers. A total of 1,763 operational taxonomic units (OTUs) spread across 26 bacterial phyla were observed with the most dominant phylum being Proteobacteria. We observed a decreasing trend in diversity from the lake, rivers to WWTPs. The genus *Planktothrix* constituted 19% of the sequence reads in sample J2 collected from the lagoon. All the isolates recovered in this study were affiliated to three genera: *Pseudomonas*, *Klebsiella* and *Enterobacter* in the phylum Proteobacteria. A combination of metagenomic analysis and a culture-dependent approach helped us understand the relative abundance as well as potential nitrifiers and denitrifiers present in different samples. The recovered isolates (Figure 1) could be used for in situ removal of nitrogenous compounds from contaminated wastewater.

### **Biography**

James Wachira is a competent and innovative microbiologist from Kenya with a specialization in microbial systems, microbial ecology and physiology, cell biology, molecular biology, and biotechnology. Expertise in conducting basic research methods, isolating and maintaining microbial isolates, and molecular characterization of microbes. Constantly driven in acquiring new knowledge and skills. A passionate and adept team player, committed to offering leadership and learning from fellow teammates. Excellent communicator and instructor who can help clarify complex biological concepts to audiences with diverse fields. A resourceful, versatile, and fast-learning person with a keen desire in developing novel methodological approaches. I fully endorse working with researchers from various domains to embrace new skills and knowledge and tackle emerging gaps in research.